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THE DIMENSIONS OF HUMAN EVOLUTION

A BIO-PHILOSOPHICAL INTERPRETATION

By
RADHAKAMAL MUKERJEE

FORMERLY VICE-CHANCELLOR, UNIVERSITY OF LUCKNOW
DIRECTOR, J. K. INSTITUTE OF SOCIOLOGY
AND HUMAN RELATIONS

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PREFACE

Man lives in several dimensions or orders of environment: biological, social and ideal or transcendent. The old frame of reference of Geddes and Thomson for biological studies, viz. the interrelationships of Organism, Function and Environment or Folk, Work and Place requires to be recast in three major ways for a "general" theory of human evolution.

Firstly, the dynamic and multi-dimensional character of human environment and adaptation is to be clearly recognised. Man's physical environment has no fixed boundaries, while his social environment is assimilated into and enmeshed with the former. Together these constitute a dynamic unity that expresses itself in qualitatively higher dimensions of adjustment—behaviour patterns, values and modes of social organisation and experiences that are transmitted along with the inherited mechanisms of adaptation. We need, therefore, to make clear the significance of man's social heredity vis-a-vis organic heredity for his selection and survival. Much more than his genetical system, his external social heritage of values, traditions and institutions that registers the gains of the past and anticipates those of the future, constitutes the basis of his evolutionary progress.

Secondly, we have to envisage human adjustments in terms of reciprocal or circular interaction or "transaction" of the "field" or "life-space," following the mode of thinking of Dewey, Bentley and Lewin, viz. Man-in-his multi-dimensional Environment. Man and Environment, both physical and human, through their reciprocal interchange and interpenetration, continually transform themselves, and move far beyond their present equipments, resources and experiences. This forward-orientation involves qualitative elements of goal and value-seeking and fulfilment in human adaptation and evolution.

Thirdly, the qualitative change in the pattern of human evolution includes self-transcending, purposive direction, orderliness and control. The accumulated force of man's environment and social traditions, values and experiences as well as conscious rational control of behaviour and environmental conditions bring about quick, continuous, ideally planned evolutionary advance in his case, and usher in unpredictable, transcendent values and potentialities.

There are a forward-looking wholeness and directedness in Nature, Life and Mind which only can satisfactorily explain the adaptedness of the living creature to the environment through its total being, and not its particular organs and functions, its regularity of direction or tendency of

sequences of movements and behaviour under a variety of conditions, and its exploration of new conditions and possibilities of the life-situation in the present as well as later phase of its career. Only a forward-oriented dynamism behind evolution can adequately interpret the chain of anticipatory instinctual behaviour in the insect and animal kingdom. Grubs prepare in advance chambers for the winged creatures into which they will be later transformed. Sea-weeds, fire-worms and fishes exhibit a sequence of reproductive behaviour coherently anticipating the rhythms of the moon and tides. Gregarious birds undertake periodic anticipatory flights equator-wards and back in the sequence of the seasons. The homing, nesting and hibernation of many mammals forestall recurrent changes of season and weather. Many modern biologists, who call their field of study of animal behaviour "ethology," following the lead of Lorenz, Tinbergen, Thorpe and Hess, suggest that the highest animals develop certain elaborate forms of behaviour that are not inborn or "instinctive" in the old sense but which they do not need to "learn" either, and that depend on hitherto unrecognised sense-organs, or a sense of directedness and forward-oriented ability to respond coherently to complex communication systems. Instincts are reconceived by them as a hierarchy of directed activities motivated from within, and susceptible to imprinting, priming and release at a variety of levels.

In man due to his unique urges and capacities of symbolisation, reflection and transcendence, the direct, purposeful and forward-looking orientation provides the major key to his evolutionary advance built up on the dim apprehension of the future of sub-human organisms and a continuous creative and transactive trend in a world of coordinated sign and signal systems. His eternally out-bound intellectual intuition, aesthetic empathy, moral aspiration and mystical apprehension of life, society and the cosmos as a whole are all universal mechanisms operative within the persistent, ascending evolutionary process that guide him beyond biological goals and values. Subordinating his narrow and finite goals and values to those of an open, symbolic community, not bound by space and time, these promote an unlimited moral order of mankind and cosmos. This is the *summum bonum*, the goal and law of his evolutionary direction.

Man's biological heritage is overlaid and obscured by his social heritage of values and symbols in his evolutionary development. As a biological population is a pool of genes, so is human society a pool of values and symbols. Like genes, values and symbols vary, and are selected and transmitted from one generation to another. The value-and-symbol system not only determines the structure and functions of society and directs its evolution, but is itself subjected to an evolutionary process. The all-pervasive, flexible symbol complex of the human community, embodying its socialized concepts, goals and values, is the new basic mechanism

at the dimension of psycho-social evolution superposed on the biological evolutionary system. This new socio-genic mechanism is structured and systematized into, and identified with the community's moral order and value-hierarchy, which is partly *interiorised* and inherited as the conscience of the individual, and partly *learnt*, taught and transmitted as the external social heritage. The moral order or value system itself evolves due to the dynamic interchange between the internal dispositions and potentialities of man, and his external legacy of values, symbols, groups and institutions. It takes complete and effective charge of both the adaptive education and socialization of the individual and the adaptation of human groups, institutions and values to the open psycho-social environment of mankind-and-cosmos as a whole.

The socio-genic mechanisms of human evolution are, therefore, essentially *moral*, directing men, societies and cultures, and hence the human species to ever richer values and possibilities. The latter are defined by reflective and ethical man in terms of man-with-man and man-with-cosmos harmonies and integrations. In spite of the profound ambivalences and contradictions of human nature that modern psycho-analysis has in particular laid bare, the 'eupsychic' person moves deliberately, and hence ethically, or spontaneously, and hence mystically towards broader and deeper wholeness, harmony and transcendence.

Accordingly what we may call *Evolutionary Transcendence*, with its imperatives of ever richer and greater wholeness, transcendence and unity of man with the mankind-and-cosmos whole, emerges out of man's own nature, out of his evolutionary status and role in the cosmos. Man's morality—the unique human art of living by, and for symbols—undefinably controls him from beyond, and increasingly determines the pace, dimensions and boundaries of his evolution. It remoulds and reshapes his dispositions, values, strivings and capacities, fostering empathy and identity with something beyond and larger than himself. Morality in its higher evolutionary phase transcends society whence it had arisen, or includes finite society in the transcendent society.

It is not a natural science oriented social science but rather a new human Bio-philosophy grounded in the theories of emergent evolution, of holism and of integrated levels in life, values and society that can bridge the present gulf between the biological and the social sciences. Darwin failed to stress that human evolution is fundamentally not an organic but a psycho-social transformation. Yet the above theories have grown out of Darwinian thought and provided the broad frame of reference of modern philosophy from Bergson, Samuel Alexander and Smuts to Whitehead, Broad and Conger. There are two basic scientific postulates of Bio-philosophy viz., first, that the reality or cosmos as a whole is a vast, open, indivisible process of evolution that is differentiated into certain dimensions

or phases integrated and co-ordinated with one another; and, second, that the procedure of thinking should be to focus upon the relations between the events and processes of evolution in its various dimensions or phases. Modern knowledge is moving towards the methods in which it studies realities as organisms rather than atoms or particles, and processes rather than structures, viewing also all organisms including Person, Society and Culture as viable and fluent, changing at any time and in several directions, and achieving a value through their togetherness, wholeness and transcendence.

Man pushes his evolution forward in many directions or sectors through ever-transcendent mind, values and dimensions of existence. Its end-products are Man the Macrocosm—Cosmic Values—and the transcendent Society of the Cosmos, "holistic" and "open" rather than fractionalised and circumscribed. Bio-philosophy using theories of spherical unity, continuity and transcendence can alone adequately interpret the fusions, continuities and balances of the Person-Value-and Cosmos schema.

Bio-philosophy aids the formulation of what we may call a "general" evolutionary theory through three major unifying concepts. The first is the organismic view accepted by many philosophers, mathematical physicists and psychologists, but hardly by any social scientists, according to which all the three true social realities—Human Personality, Values and Mankind-as-a Whole are "organisms" in which the plan of the whole governs the attributes and processes of the subordinate systems. The conclusions of the *holistic* or organismic theory of psychology and personality and of the Gestalt school need to be more fully integrated into the study of human evolution and values. The development of the unique human person, of values and of the multi-dimensional "world" of man is interlaced with one another. Neither Personality nor Values nor the enlarging World System can be understood in separation from one another, while each is a whole in terms of which its own parts in turn can only be rightly interpreted. Such interpretation rests on the appreciation of circular causal systems and use of concepts defined by reference to the higher level phenomena exhibited by the larger or more harmonious wholes.

The second is the notion that all true realities are also emergent or *open* systems, according to which they move forward to ever higher levels of organisation, exhibiting new qualities not entirely deducible in terms of the preceding stages. There are successive orders, dimensions or organisations of living systems, each distinct and self-contained, yet connected with one another in the hierarchy of nature. Bio-philosophy replaces the older concepts of form and matter by the categories of energy and organisation. Energy and organisation are animating principles in the highly complex and specialised systems of Personality, Values and Society no less than in the ecological communities, living organisms and

cells. There is a continuous ascent in the level of energy and organisation characterised by the trend towards increased complexity, wholeness, purposiveness and macroscopic orderliness. It is contended by some physicists such as Schrodinger that *organisation* is one of the major key categories in the cosmos, and may actually regulate matter and not merely be derived from it. Their hypothesis is that centres of organisation exist independently of the matter in which they appear as concrete forms, each as an integral part of a harmonious and open cosmic whole. There is an endless continuity of organisation in the open evolutionary process through both its physical and organic dimensions. Simultaneously, the "open system" manifests an increasing tendency to keep at a distance from equilibrium. Man, values and the environment of the human community are never in equilibrium, but at the same time spontaneously move towards greater organisation, wholeness and purposiveness.

But for the inherent, infinite potentialities of human nature, values and world to acquire greater balance, wholeness and organisation there would be no problems nor meanings of human evolution and culture. The forward-oriented concepts of man's personality, values and self-actualisation transcend both his environment and himself. It is only in terms of openness, communion with mankind and cosmos as a whole and transcendence that we can truly evaluate human nature and evolution in respect to all human efforts i.e. to all values. These provide, indeed, the criterion of judgment of ethical codes and systems of different societies and cultures—embodying what may be called 'biological wisdom' or the law of man's progressive evolution.

The openness of human person, societies and values is an essential condition of awareness of, and adjustment to, all phases of experience in their totality, of constructive creativeness and of what the semanticists call 'extensional orientation,' the psychologists term 'self-actualisation, or 'self-transcendence', the evolutionary ethicists term 'trans-humanism' or 'neo-humanism,' and the philosophers define as the all-encompassing being of transcendence. Due to the continuous improvement of human communications and inter-thinking, mankind shows ever deeper, broader and more intense social activities, values and experiences. These bind the various peoples of the earth in an intricate, ramifying web of values, symbols and culture—an integrated, global evolutionary machinery that realises new intrinsic and transcendent values and orders of existence for man. Human evolution ever advances on the basis of human communion, creativeness and openness to values and experiences at successive dimensions.

The third is the concept that the view-points termed 'mechanistic' and 'finalistic' in biology are not contradictory, but rather exhibit what Niels Bohr calls a *complementary* relationship connected with men's position as observers of nature. Accordingly, instinctive and conscious

behaviour, stability and change, unity and individuation, freedom and determinism, intellect and intuition, and instrumental and intrinsic values comprise antinomic and complementary modes of adaptation to the environment. The notion that these have mutually exclusive complementary applications is of major significance for a unified theory of evolution in Bio-philosophy. Bio-philosophy finds the multi-dimensionality, polarity and ultimate unity of polar human tendencies as the essence of human goals and values, and establishes the logic of dialectic and the concept of immanence as the theoretical model of human evolution.

Bio-philosophy will, no doubt, have as vigorous an impact on the thought pattern of civilization in the coming decades as mathematical physics has today. The area where this impact will be felt most will be that of the orders or dimensions of integration in biological social systems. In the new methodology of Bio-philosophy, the philosophy of Nature, Life and Mind and the philosophy of Values would be reconciled with each other; and both rescued from an unduly limited terrestrial outlook but rather would conceive of Nature, Life and Values in several dimensions with their vistas of the progressive realisation of the whole, of ever richer man-with-cosmos and man-with-man concords and transcendences. Human Evolution still goes on. The cosmos ever transforms man as it is itself transformed by his mind and values.

The present volume is an expansion and revision of lectures delivered at the University of Bihar in the autumn of 1959. The theme was suggested to me in view of the Centennial Celebration of the publication date of Darwin's *Origin of Species* (November 24, 1859). My intellectual indebtedness will be plain to experts: to Patrick Geddes, Bertalanffy and Julian Huxley, biologists; to Malinowski, Ashley Montagu and La Barre, anthropologists; to Freud, Jung and Flugel, psychoanalysts; to George Mead, Gordon Allport and Gardner Murphy, psychologists; to Giddings, Sorokin and Mumford, sociologists; and to Bergson, Dewey and Whitehead, philosophers. They are all specialists, who are at the same time humanists, and have given an enlarged meaning and elegance to the principles and processes of life, mind and society. Their methods and conclusions have been helpful for a bio-philosophical consideration of man's unique evolutionary transcendence, and his control through society and values, of himself and his dimensions of existence and development. This has involved a widening of the conceptual frame-work and tools and fresh co-ordination and synthesis of bio-philosophical facts and theories derived from separated domains of knowledge that are now by and large logic-tight compartments with their limited descriptions of the human person, values and society as realities.

In the present most grave crisis ever faced by man in his long and chequered history, a unified Bio-philosophical model of human evolution

and values will, it is hoped, help to restore his trust in the human personality, values and potentialities, and in the ecological, psychological and spiritual oneness of mankind—the destiny of human evolution.

Certain materials of the volume have appeared as articles in the Philosophy and Phenemenological Research, and the Journal of Sociology and Social Research, U. S. A. and the Archiv Fur Rechts-und Sozial philosophie, West Germany. My thanks are due to my pupils, Mr. S. K. Khinduka for the revision of the proofs, and Dr. Kumud Prabha Trivedi for the preparation of the Index.

University of Lucknow
Vijaya Dasami, 1962

RADHAKAMAL MUKERJEE

CHAPTER I

INTRODUCTION : A GENERAL THEORY OF HUMAN NATURE AND EVOLUTION

Beyond Biological Evolution

Human Evolution is entirely different in its aim, mechanism and course from evolution in the animal realm. Man's environment and evolution are not only physical but also social. His adjustive mechanisms are more psychological and cultural than physiological. In organic evolution it is only where mind reaches its fullest development, as in the Primates, do social relations and organisation really emerge. Conversely, only where mutual aid, division of labour and symbolic communication become sufficiently developed to permit social integration does the mental life show a high degree of complexity, freedom and transcendence. Social and mental development converges in the biological series, each representing a facet of the same high organisational dimension. The dynamic give-and-take between man and his many-dimensional environment establishes the increasing, mutually interdependent roles of his symbolising, self-transcending mind and symbolic social inheritance in his evolution. Both the abstract mind and the social environment, created by concepts and symbols, are characterised by "openness" and transcendence. These are so unprecedented that they have changed the mode, dimension and direction of biological evolution that now completes and transcends itself in human evolution. The notion of transcendence is strictly correct, crucial and generic. The human dimension of evolution obviously presents new features that surpass those of organic evolution.[1] The architecture of organic and human evolution reveals itself in ever superior and more complex patterns of selective and purposive control, openness, harmony and transcendence in a spiral of progress from the biological to the social-psychological and moral dimension or order.

The study of the onward course of evolution should, accordingly, be rooted in a recognition of the basic transformation of the processes, means and ends of evolution. The transition from biological to human social evolution is marked by triple major shifts : the mechanisms change from haphazard, automatic, natural selection to conscious social policy, conformity to ethical code and individual learning and acquisition; second, the instruments are transformed from genetic equipment and mutation to the

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[1] See Huxley : *Evolution in Action*; also Roe and Simpson (Ed.) : *Behaviour and Evolution.*

social and symbolic heritage and the uniqueness, creativity and self-transcendence of the individual; and the goal is altered from mere efficiency and survival to the creation, fulfilment and extension of symbols and intrinsic values accruing from the dynamic reciprocity between mind, values and cosmos.

Man has become the symbol-and-value-using animal, and in the "model" of human evolution proposed, human values should not only include "self-actualisation," "creativity" and "psychic integration," as suggested by several modern psychologists, but also wholeness, communion and self-transcendence as defined by the fulfilment of his as yet unrealised nature and potentialities. The most distinctive productive activities and strivings of man are in the field of symbols and intrinsic values that are beyond-biological and transcendent, and are more than instruments of adaptation and survival. These follow their own autonomous laws of spherical unity, continuity and identity, and are derived from man's essential being that his mind identifies with the ultimate reality or Being. The truth, goodness and transcendence of Being embody themselves as laws, directives and imperatives of evolution. What man essentially is, is mirrored in evolution, though not fully. Evolution, like man himself, is inexhaustible, unpredictable and transcendent.

Human Evolution Infinitely Open

Intrinsic and transcendent values and purposes of human life entirely change the dimension on which evolution occurs. Human evolution is fraught with the unknown potentialities of human mind, personality and cosmos as wholes as an essential part of human adaptation. The scheme of human evolution that Darwinism describes, is limited to the specific and circumscribed bio-social situation, and bears no relation to the potentialities of human life in its whole dimension—the emergent processes, the organic creativeness, orderliness and directedness, and the infinitely "open" course and pattern of evolution. A unified evolutionary theory acknowledges the universal and open trend of evolution to develop new patterns beyond the stability of the organism and its well-adapted mode of behaviour, and discover new potentials of Life and Organisation. Human Values and purposes embody the human organism's exploration and transformation of the potentialities that the cosmic structure provides for him. The evolutionary career of man, indeed, holds in its bosom the transcendent possibilities of cosmic evolution itself.

The vast garden of Nature hides germs and roots that grow and mature into manifold organic forms and patterns, which individually and collectively appear to be noble and beautiful, trivial and bizarre, monstrous and loathsome, and are mingled indifferently—useless weeds, noxious herbs, beautiful flowering plants, seed-bearing cereals and fruit-bearing trees. Evolution brings the disorderly forms of vegetation in relation to one another, and gives

us glimpses of increasing orderliness, directedness and solidarity. The whole heterogeneous garden in space and time achieves in the course of evolution an ever richer, more harmonious, more complete Life and Organisation. This integrative trend is more than merely mechanical, but yields intimations of a kind of wholeness, openness, directedness and transcendence that become values and purposes what man's reflective self identifies with its own creative nature, *telos* and destiny. It is meanings, values and purposes in the cosmos-mind that counteract the operation of the second law of thermo-dynamics, prevent the natural trend towards universal entropy, and build up ever richer and more completely organised patterns of energy—cosmic minds, universal personalities and comprehensive macrocosm. Everything else in Nature tends towards steady dissipation, disorganisation and chaos; only Life and Mind reveal an unending enrichment of their organisation through the patterns of human values and possibilities. Values and possibilities that man encounters in the course of evolution are unlimited and indeterminate, constantly impelling him forward towards indefinable new ranges of insight, appreciation and dedication. The modern psychologist's goals of mental health and security, integration and balance, and those of self-actualisation and autonomy are not based on the correct model of human evolution in which the dynamics of self-transcendence and integrated harmony of opposites of self-awareness and love, individuation and unity, existence and essence play the decisive role. Human goals and values ever recede due to the "holistic," harmonising drive and tendency of the human mind that must strive for ever fresh union of antinomies at different orders or dimensions of being. That is how man achieves his essence, the totality of his ever unrealised, unpredictable humanness. Another way of stating the same truth is that Evolution, infinitely open and ever moving forward, is the creation and realisation of ever more harmonious, universal, transcendent values, experiences and possibilities. Man will ever find something qualitatively new and strange about his own nature and cosmos.

The Triangular Evolutionary Frame : Man—Values—and—World System

The general notion of hierarchical ordering and dimension of wholeness and openness of the living system needs to be formulated by Biophilosophy. This requires to be spelled out in respect of the triple realities : the human personality, the values and the organisation of mankind and cosmos-as-wholes—the stable and universal patterns of human relations, behaviour and norms that have become the end-products as well as trustees and agents of the evolutionary process.

A fundamental "general" theory of human evolution rests on the notions of value and value-hierarchy as central in the evolutionary picture of man and universe, and measuring the progressive phases in the course and control of evolution. It is built within the triangular frame-work

represented by the coordinates: Man in Evolution—Values—World System. The dynamic mutual interdependence or "transaction" of the three basic complementary phases of Human Evolution has three facets: (1) the qualitative improvement, behaviour and enlargement of human mind and personality; (2) the progress of social living in conformity to a universal, hyper-personal moral code grounded in the enrichment and diffusion of intrinsic and transcendent values; and (3) the maximum extension of boundaries of the human community, marking in their togetherness man's steady advance. The three-fold interwoven concepts of the World-Man, Cosmic or Transcendent Values and orientation to Mankind-as-a Whole have their basis in the very structure of the human organism, progressing and surviving creatively as such. These comprise an absolute basis, therefore, for any dynamic human ecology, sociology, ethics and theory of personality and values. The entire ecology and psychology of "man and superman," the scale of human goals, values and ideals and the system of inter-cultural relations will have to be re-thought for human survival and progress.

The triple, interdependent realities and systems of Personality—Values-and Mankind-as-a Whole represent the culminating products as well as the agents and guardians of the cosmic evolutionary process. Each of these social realities, thriving by reciprocal interchange and interpenetration with the other two, and representing as it does the most complex configuration in the cosmos, shows similar formal or functional processes and relations (isomorphism) at the various levels from atom and molecule to protoplasm, and from animal behaviour to human values and transcendence.

All through there is operative the grand cosmic law of integral and orderly directedness—the prescient, dynamic principle existing in all matter, energy and organisation in the cosmos. This is the basic hypothetical construct or "model" of man underlying a "unified" theory of Evolution. Not merely the whole body and mind of man, but also his whole personality, behaviour and symbols and the whole values and experiences of mankind and cosmos "holistically" and synergistically interact, interpenetrate and direct total human evolution.

Integral View of Human Nature and Potentialities

An integral, evolutionary view of human nature, values and potentialities, grounded in an interchange between the changing psyche and the changing physical and social environment, should be developed and assimilated into a new, unified evolutionary model. This would supply the necessary corrective for the notion of immutable impulses, dispositions and faculties of the human individual of classical psychology. The latter was largely the product of the stress of man's physical and mental isolation and egoism that resulted from the impact of the Darwinian theory of evolution on social thinking. Modern psychological science is now seeking a new

and thorough synthesis of human behaviour and evolution, based on the recognition that human behaviour evolves a wholly new set of mechanisms, those of abstract intelligence, learning, symbolisation and valuation. These evolve in their own way, and alter the processes of biological adjustment through an increasing selective and purposeful control over the physical and social environment, which is another aspect of an increasing actualisation of human values and potentialities.

Recent advances in the biological and social sciences have largely corrected the lop-sidedness and exaggeration of 19th century Social Darwinism. This postulated a more or less fixed human nature and an egocentric mode of human adaptation that were oriented largely towards cutthroat competition and struggle for existence on the scene of the earth. Man's aggression and violence, war and rape were emphasised, while his disposition and capacity for building up families, folks, communities and larger social integrations, and the corresponding endowments of tenderness, affection and altruism were underscored. He experiences deep and spontaneous feelings of identity and empathy with fellowman; the highest values and experiences he has prized in his long and steady mental growth are those that transcend his narrow self, and can be shared with the most extended community he can conceive. There are deeply ingrained social impulses, emotions and values of man which bind him to other men by ties that cross the boundaries of time and space. The evolutionary development of his abstract intelligence, learning habits and values of self-transcendence, love and altruism altogether transform human nature, and change the dimension and tempo of human evolution.

An altogether new model of human nature and behaviour is now emerging from biological and behavioural studies that would consider the psycho-biological isolation and ego-centric, competitive and aggressive behaviour of the individual, posited by the classical social sciences, taking their cue from the older biology, over-simple, lop-sided and near-pathological.[1]

First, the classical model of fixed human impulses and dispositions is replaced today by a dynamic model in which human nature is considered as a "field" function of both genotype and physical and social environment. Insect social evolution shows the possibility of complex and harmonious social relationship and behaviour through changes in genotype, giving insect societies a permanence and continuity not met with at the human level. But the dominance of genetic mechanisms in the evolution of social insects has meant a rigidity that excludes susceptibility to change. Human nature is most plastic, adaptable and versatile, moulded in the crucibles of change. Man is the most viable animal in his rapidly changing environment.

[1] Compare in particular Goldstein : *Human Nature in the Light of Psychopathology*; Murphy : *Human Potentialities*; Maslow : *Motivation and Personality*; Moustakas : *The Self*; and Allport : *Becoming*.

Secondly, the model of human evolution, working on the basis of the creative interchange of impulses, needs and values with the social environment, establishes the scientific criteria of the social nature of man and of common human dispositions and behaviour. It also stresses the psychological significance of social conditioning and canalisation, and plasticity and flexibility for the individual along with his rational, egoistic and aggressive side.

Mankind-as-a Whole, an Empirical Scientific Model

Human conditioning, canalisation and learning rest on a highly developed system of signs and symbols which is uniquely human. Man alone among the animals can create, change and manipulate signs and symbols for stimulating ideas and feelings of fellowmen and groups. His system of symbolic communication, adaptive, flexible and resilent, is not only the foundation of his sustenance, communication and way of living but also of his awareness of self and not-self. His social consciousness, needs and values are largely products and functions of his symbol complex. These comprise a whole new array of mechanisms that have their own trend of evolution, direct the course and processes of human biological and psychosocial adaptation, and remould man-and-man, and man-and-environment relations.

Because mankind comprises a single species, there is a biological basis for a common system of symbols or culture based on common human needs, strivings and values. But throughout history man has lived and struggled in divergent and often hostile systems of culture. These have not only prevented him from undertaking his true evolutionary role, but have also sharpened the physical and mental differences of separate sub-groups, practising inbreeding and operating separate symbol-based systems of adaptation and specialisation. The biological unity of man and the psychological unity of human nature both consequently suffer an eclipse. He becomes less fitted in performing his unique function in nature and actualising new possibilities for evolving Life, Mind and Values.

Yet the biological unity of Life and Man and the psycho-social unity of Mind and Values are fundamental and appropriately receive emphasis in recent thinking. The entire course of evolution is now envisaged as bringing about such modification of function and structure of organisms, and such adaptation to other similar organisms as result in the development and persistence of larger entities, inclusive of the smaller, through successive and higher levels of complexity and integration. Redfield thus summarises the findings of a recent Symposium: "Fitness way means cooperation for mutual benefit both between species and within intra-specific populations as well as between parts of the organism. Departing from the language of science, one might say that the individual metazoan, the infusorian population, the ant-colony, the flock of fowl, the tribe and the

world economy areall exemplifications of nature's grand strategy."[1] Social science is, indeed, having the full impact of the dominating biological concept of integrative levels of complexity and integration. The highest level of evolutionary complexity and integration is reached in the psyche of man as "the man-binding and the time-binding animal", identifying his needs, values and experiences with those of his fellowmen who surround, precede and succeed him. The search for man's social nature and feelings and common dispositions, needs and values is today as strong among human biologists and psychologists as among anthropologists and sociologists.[2] Gordon Allport presses for a discrimination between the root desires of men in all countries that are very similar and their divergent and incompatible demands, and between intrinsic values and instrumentals, and advocates cross cultural investigations for the comparison of human motives in many lands.[3] A "high-ceiling" as contrasted with a "low-ceiling psychology" (in Maslow's sense) shows that the root desires are common to all mankind and are shared values, and that healthy or "eupsychic" persons seek a balanced and harmonious realisation of their higher and lower desires, interests and values.[4] Man has, no doubt, a tendency towards unity, wholeness, freedom and transcendence of personality, towards universal and transcendent values. Only a Bio-philosophy (or Philosophical Psychology) may establish the generic social impulses, interests and strivings of human nature and with this the common goals and values of men. On the level of human affairs the conditioning and canalisation by a system of word symbols and values, such as the Declaration of Human Rights, the Code and Charter of industrial workers, women and children of all nations, and International Organisations like the UNO, ILO, FAO and UNESCO increasingly modify human goals and strivings and promote the organisation of mankind-as-a whole, mankind-feeling and mankind-morality. These are rooted in a common genetic system of human needs, values and aspirations.

There are deep and generic "pan-human" universals as regards human needs, values and behaviour that transcend historical and cultural differences. The older ethno-centrism is gradually giving way to a scientific study of cultures that reveals not only universal motivations, values and strivings among men, but also formal similarities of social structures and functions. The universal elements of the heritage of traditions, sentiments and values demand unified, empirically based psychological concepts of the mature, integrated, 'eupsychic" human person and a basically common denominator

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[1] *Levels of Integration in Biological Social Systems*, Biological Symposia, Vol. 8.
[2] Morris: *Varieties of Human Value*.
[3] Normative Compatibility in the light of Social Science in Maslow (Ed.): *New Knowledge in Human Values*, p. 149.
[4] Maslow: *Motivation and Personality*.

of humanness—common human needs, values and strivings—that aspire beyond and above the differences of cultural norms and standards among different societies and peoples. Mankind-as-a whole, grounded in the wholeness of both man and culture, and functioning as one great organisation, reservoir and directive agency of the higher order of human values and code of morality, must be accepted as an empirically derived scientific model of the theory of human evolution.

The Balance of Human Uniqueness and Humanness

Thirdly, human evolution must be regarded as a stage where individuals not only fit themselves to, or select their suitable environment, but also can control and reshape the environment for themselves, for their society, and for the human species in terms of emerging needs, values and possibilities. Man combines the biological advantages of increasing versatility, uniqueness and transcendence as an individual in changing physical conditions with those of order and harmony in the social tradition and organisation.

Human social organisation can be biologically favourable if only it can establish a balance betwen the expression and repression of naive impulses and needs and idiosyncratic, self-transcending values and experiences, and between the relatively stifling encrustation of specific tradition and culture and the broad commonness of humanity. Such balance can alone offer opportunities for the development of the unique traits, capacities and achievements of the individual and the extension of the boundaries of the human community. Therein lie his evolutionary fitness and prospects of further advance.

As both human uniqueness and humanness obtain balanced fulfilment, these can give rise to new kinds of environment that may elicit yet finer differentiation and more sensitive integration of the inner life. Man's biological and spiritual goal and fulfilment coincide. For the supreme creative expression of the individual that springs from the plumbing of the deepest recesses of his mind also reveals his most extensive possible consciousness and values. The twin flowers of human mental evolution blossom together—the range, depth and uniqueness of individual creativity; and the communion, interpenetration and solidarity of minds, which Bergson finds analogous with the phenomena of 'endosmis'.

The garden of mankind today nips these flowers of mental evolution in the bud. Mankind is now divided and segregated into vast, hostile *blocs* of social and economic systems and cultures that lead, on the one hand, to excessive rigidities of thinking, feeling and ways of living of considerable masses of men in different continents, and on the other, to a disruption of the world tradition. The crisis in contemporary civilization has also become an evolutionary crisis due as much to the large-scale lapse of freedom, worth and dignity of the individual, and invasion of the personal sphere of artistic and scientific deployment of the resources of life, as to the

depreciation of the common humanness of mankind. The massive, impersonal contemporary trends of rigidity and refractoriness of organised, industrial cultures, the thorough-going, relentless exploitation of the great earth and its peoples by modern science and technology, and the disintegration of the world system spell evolutionary retrogression and peril for the human species.

The World Environment and Tradition of Man

Alone among the animals man has developed an open world tradition and culture. First, every major discovery in man's science and technology, every development of industry, commerce and communication widen the limits of his environment and increase the range and scope of both competition and cooperation between peoples having overlapping areas of occupation, diffusion and control. The human environment is now global in its extent. Because of the wide range of the human environment genetic specialisation alone cannot ensure man's survival. His adaptive potentialities combine the methods of genetic differentiation with progressive control and modification of the environments by his social traditions, experience and learning. Human evolution, and especially civilized human evolution, thrives on both genetic and cultural plasticity as mechanisms of adaptation to the shifting and enlarging human environments. Second, the heritage of man's knowledge, skill and culture also tends to be global. With the increase of the range and complexity of his environment and the diffusion and pooling of world traditions of knowledge and experience, he will have to understand his evolutionary future in terms of the species and of his world-wide environment.

The openness of his global environment, unified by science, communication and culture, can no longer be resisted by ignorance, prejudice and unfamiliarity with a strange historic social system and tradition. Neither the wholeness of the human personality, nor the emerging unity of the present world community permits this.

The Imperatives of Global Human Evolution

This poses the most urgent intellectual and moral issue for both human survival and growth in the present generation—how to establish a balance between the familiar and the strange, the intimate and the remote goals, values and ways of living without losing depth, integrity and freedom of the self. The open world system of the twentieth century with its new global qualities and involvements, calls for new personality traits, goals and values for man's progress. Contemporary man has to acquire a new intellectual understanding and appreciation of distant and unfamiliar peoples, develop world-wide economic techniques, skills and resources with them in practical terms, and make common cause with them in terms of moral and spiritual equality. He has to replace the cruel and exploitative

inhumanity of the 19th century world system by a new global communion, compassion and consecration. This implies that the scope of human knowledge, appreciation and experience, the boundaries of human communities, the dominant type of personality, the hierarchy of values and the code of personal, national and international rights and obligations will be fundamentally transformed, reoriented to the majesty of the vast, productive and shared life of mankind-as-a whole as this century progresses. Such are the imperatives of world tradition and culture in the present environment of man, which has acquired a global quality than ever before, and now determines the conditions of his security and survival.

Man, both as individual and as species, has to recognise this momentous change in the quality and scale of his environment, and utilize all his resources for his proper psycho-social adjustment. A world-wide physical and social environment and a global consciousness offer indeed a richness and diversity of human opportunities and potentialities, hitherto unprecedented in his career. His inner harmony and balance with the grand aims and commitments of a world system which seem to be the results of natural selection, can only now further his evolutionary advance. The control of his genetical equipment in the direction of a greater endowment with the creative forces of understanding, imagination and empathy, altruism and mankind-feeling, and the enlargement of his acquired environment into a true open World Community are the next steps of his progress.

Human Possibilities

The tempo of human social evolution is accelerated due to the adventure and creativeness of a few world-individuals as well as organised global social policy and effort. Both can overcome the limitations imposed by the excessive genetical endowment of anger, competitiveness and aggressiveness and by the tardy genetical improvement of the race. A single, gifted, sensitive and courageous individual with a new human love, compassion and reverence and vision of the earth-community may play a more significant role in human advance than any skilful or drastic eugenic policy. For, he can transform the minds and hearts of the people in a single generation; while new heritable qualities take several generations to be established within the genetic stock of the community. In man the evolutionary process has obviously lifted itself from the bio-physiological to the moral level of performance and transformation; and correspondingly both the criteria and techniques of human adjustments and progress have been transformed. All the levels of human nature and behaviour, biological, social and transcendent, are involved, all the elemental drives and satisfactions of curiosity, challenge, love, beauty, goodness and compassion are orchestrated in human transformation. This onward march is epitomised and symbolised by transcendent personalities, universal values and global culture in their endless, creative interchange.

Human evolution has been, indeed, enormously quickened by the supersession of the mechanisms of heredity and variation by those of variegation, control and transmission of the inevitably enlarged environment at the political, economic and cultural dimensions. Civilized man's world-wide milieu so remoulds his goals and values that the gifts of his arts, sciences and religion, beauty, goodness, and sensitivity increasingly enrich entire mankind. In fact this change-over has made evolution not merely purposeful and global, but also introduced into it the unpredictable drive and impulsion of the rebels, artists and seers, all world-minded persons today.

The latter are the true prophets of human evolutionary advance. They realise themselves in an endless procession of value-creations and value-hierarchies, transcending value-experiences that embody fresh, rich and sensitive integrations with mankind-and-universe-as wholes, making for further creative integrations and fulfilments of human nature and possibilities through the unlimited give-and-take or interpenetration that transforms all parties to the transaction—Man—Values—Universe.

Transcendence as the Principle and Value of Human Evolution

Man's evolutionary destiny is Transcendence—surpassing himself through a reverential identification with the unbounded cosmos-totality, God or Being, rather than finding fulfilment in any final self-sufficiency or wholeness. Transcendence is another name of Being with which man, in his spiritual attitude, endeavours to identify himself. Because Transcendence is the foundation of all finite creatures who live and move in It, man's relations to fellow creatures becomes reverential. Reverence proclaims Transcendence in all human relations, behaviour and values. It fuses love and knowledge with universal compassion and altruism, and builds up the unlimited moral community. In reverence man strives after, and achieves the perfect merger of I and Thou, of all and All.

The generic experience is that the perfection of human character and values is expressed in the reverence for man, for life, for society, for mankind, and for cosmos as a whole, revealing a complete identification of human choice and action with transcendental meaning and purpose. Such moral and spiritual transcendence in reverence remakes both the cosmos and nature of man exploring and unravelling their respective possibilities to the full. The enlarged universe of Human Mind, ever extending its resources for the deepening, enrichment and expansion of Life and Organisation, is the pattern of One-Universe and Man-System, that widens the prospects of human evolution for both individual and species within an over-all unity of world science, economy, fine arts and knowledge. Man's conscience, faith and imagination link him undefinably to the Being of Transcendence. Jaspers observes: "The God-head is origin and goal; it is peace of mind. There is security. It is impossible for man to lose Transcendence without ceasing to be man." It is Human Transcendence

which keeps evolution on-going and open.

Cosmic Imagination

The cosmos in the course of evolution attains its richest and most comprehensive integrated mode of potential energy in Human Transcendence. The transcending Human Imagination bears in its womb both the memory of the past and anticipation of the future, and keeps alive the unending striving and organisation of Evolution. Cosmic Imagination relates as warp and woof the different parts of the whole fabric of Nature, Life and Values with one another, weaving them all in the shuttles of increasing purpose in the loom of Time. This unfolding, majestic garment that enshrouds space is called Evolution. As Montague says, "Between creative evolution and creative imagination there is more than a rhetorical analogy."[1]

The uniform, objective and scientific models, principles and laws of the human individual as an open One World-Man and of the human social organisation as an open Society of Mankind-as-a Whole, and the principles and values of Human Transcendence can redefine and direct the evolutionary trends towards greater wholeness, higher organisation and superior macroscopic orderliness at the psycho-social dimension. Such scientific constructs can develop what a recent UNESCO Committee has defined as "a mankind awareness, a mankind conception, a will towards mankind", and constitute the basis of man's further evolutionary development.

A careful examination of individual and collective evolution, both present and past, shows that if modern man, whether in the West or in the East, continues in the Atomic Age as unconsciously, dysfunctionally and dysteleologically as he has been doing in the recent past, there is probability that he may destroy himself. Man alone among the animals has the knowledge of wise and proper biological behaviour, and also of the penalties of biological short-sightedness and stupidity—the regression and suicide of the species. Never in the life history of man has there been a more desperate need for him to understand and implement the truths and values of the ecology to which he belongs than in the present age.

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[1] *Great Visions of Philosophy*, p. 25.

CHAPTER II

EVOLUTION : AN OPEN SYSTEM OF HIERARCHY, WHOLENESS AND TRANSCENDENCE

Criteria and Mechanisms of Organic and Human Evolution

The nineteenth century made us familiar with the concept of biological progress. The evolutionists consider man as the crown of creation—the pinnacle of progress defined as the cosmic evolutionary process. They, however, attach no significance to the notions of higher and lower organism, regarding the evolutionary process as one in which a species progressively adjusts itself to its environment. A species closely or near closely adjusted to its environment survives. Man's mere growth, propagation and survival become, therefore, the only measure of his adaptation to the environment. For biological relativism there is no question of superiority or inferiority among men, ants and tape-worms—all equally appropriately adjusted to their environments. Some survival, no doubt, is the outcome of retrogression, parasitism, over-specialisation and rigid adaptation to a fixed environment. Man himself could never have emerged as the result of close adaptation and equilibrium in a static environment; while early in his evolutionary career he strove after, and linked some "good" with his growth, adaptation and survival, with his way of living. It is the sense of values that is an implicit attribute of evolution in general, and that articulates itself and becomes conscious in human evolution which provides the psychological and ethical standards for human survival. There is, therefore, no automatic nor inevitable trend of human evolution in the right direction. Man as the thinking, value-creating and moral animal chooses the right goals and values for himself, for the species and for all life; and such goals and values must be rooted in human evolution. Yet many biologists today completely exclude goals and values from the evolutionary picture of man. They delink all faculties, values and experiences that are uniquely human from the organic processes. Their notion of man's environment remains largely physical, eschewing even bio-ecological factors, while his adaptation and equilibrium are considered in static, mechanistic and materialistic terms.

Man, to be sure, is not appropriately fitted to his environment, nor is the environment static, fixed or closed for him. Specialisation is particularly insignificant for the natural history of the human animal. His mental and social evolution indefinitely increases the range and flexibility of his adaptation to changing conditions without the need of any highly specialised and detailed structural and physiological adjustments within a given, cir-

cumscribed environment. Over-specialised elaborations, however adaptive these might have been to the environmental conditions, have led to the fall and extinction of many species of animals. In human evolution physical adaptability is replaced by social adaptability, and physical inheritance by inheritance of values, traditions and techniques. The variability of human goals and values supersedes homeostatic constancy, while human adaptation and survival are judged by what is basically wholesome, good or worthy in the psychological and ethical sense. Due to the emergence of goal, value and purpose, man is an "open" creature, ever adapting himself to a large variety of ways of life. The human environment is "open", achieving ever-increasing range, wholeness and harmony. Human evolution is equally "open" and transcendent, oriented towards ever receding, ever more vital and harmonious qualities and values.

Reversal of Entropy in Evolution

A fundamental "general" theory of human evolution rests on the conception of an "open" system, i.e. an essentially self-directed and active organisation that tends towards increased heterogeneity, wholeness and macroscopic orderliness. According to the classical law of entropy the natural trend of events is directed towards a chaotic state, characterised by maximum disorder or, in other terms, towards thermo-dynamic equilibrium where all processes come to a stop. Schrodinger has recently stressed that the organism continually exacts "orderliness" or "negative entropy" from outside to counterbalance the increasing chaos or entropy towards which it would degrade as a closed system. In this view the organism cannot be compared with the "closed system", marked by the tendency towards static equilibrium. The principle operative here is "order out of order", which is far different from the thermo-dynamic laws that result statistically from the principle of disorder in physical science.[1] Nature abhors a strictly closed or isolated system to which only is the second law of thermo-dynamics applicable. It is probable that entropy does not apply to the cosmos as a whole which is a majestic, creative process continually expanding and progressively differentiating. In life entropy is apparently reversed. Wiener aptly remarks: "Organism is opposed to chaos, disintegration, to death. Organisms tend to maintain the level of their organisation as a local enclave in the general stream of increasing entropy, of increasing chaos and de-differentiation. Life is an island here and now in a dying world." Again, "the process by which we living beings respect the general stream of corruption and decay is known as homeostasis."[2] Biological evolution is anti-entropic. It ever marches forward showing an increase of variety and improvement of organisation, running counter to the second law of thermo-dynamics in

[1] *What is Life?*
[2] Wiener: *The Human Use of Human Beings.*

physical science with its processes of degradation of energy and trend towards uniformity. In the living organism we, accordingly, find a preservation of order and an avoidance of equilibrium. To use Bertalanffy's words, the organism is an "open system" with constant interchange of materials and energy with the environment. It is marked by the reversal of entropy, with a trend towards increase of heterogeneity and complexity rather than towards degradation to homogeneous low-level organisation. He observes: "A living organism is a hierarchical order of open systems which maintains itself in the exchange of components by virtue of its system-conditions."[1] Hierarchical organisation, on the one hand, and the characteristics of open systems, on the other, are, according to him, fundamental principles of living nature; and the advancement of theoretical biology will depend mainly upon the development of a theory of these two fundamentals. Similarly Needham remarks that the hierarchy of relations from the molecular structure of carbon compounds to the equilibrium of species and ecological wholes will perhaps be the leading idea of the future.[2] Modern biology has discovered that in the living body there is a ceaseless interchange of atoms of carbon, phosphorus or nitrogen called "tracer elements" in which the pattern of the body is fully maintained. The cooperation proceeds from level to level of organisation from the ultimate particles, the protons and electrons, to atoms, from atoms to molecules, from molecules to the tiniest living particles, from these to cell-constituents, from cell-constituents to cells, from cells to organs, from organs to the human body, from the human body and mind to human society and finally from society to mankind-as-a whole. As we recount the levels of organisation we find that "each is larger than the one before, but also essentially more complex and more highly organised. In terms of space, each contains the smaller ones within itself. In every individual development, that of man no less than the meanest of them, the new individual starts at a low level, and climbs up to its perfection."[3] The basic issues of modern biology are relations of subordination and centralisation, patterns of cooperation, goal-directiveness and dimensions and possibilities of freedom, orderliness and wholeness open to positions, shapes and organisations of life. The tasks of Life and Organisation still continue.

Characteristics of the Open System of Human Evolution

Together with the so-called "molar" or "organismic" as contrasted with the older molecular or analytical outlook, the principles of "hierarchical order" and "open" system have important consequences for the study of human evolution. The protein molecule, the cell, the tissue, the human individual with his body, mind, behaviour and values, the ecological

[1] Bertalanffy: *Problems of Life*, pp. 129, 145.
[2] Needham: *Time: The Refreshing River*, pp. 243-253.
[3] Ibid: Matter, Form, Evolution and Us in Bramwell: *This Changing World*, p. 37.

community, the family, the nation and, finally, mankind-as-a whole are all "open systems" at different dimensions, regulated largely by the laws of their own dimension and their own duration and organisation. A theory of "open system" requires new principles of behaviour, equilibrium and control in successive dimensions of organic adaptation.

An "open system", physical or biological, spontaneously moves towards greater heterogeneity and complexity. Another fundamental characteristic of an open system is that the changes resulting from the relations within the system and the interchanges with the environment are not reversible. The criteria of progressive evolution, organic and human, from this viewpoint are dual: first, greater range, complexity and efficiency of adjustment of the organism to its environment; and, second, greater purposive control of behaviour and control over, and independence of, environmental conditions.

In the human species we measure both behaviour and evolution qualitatively. The dual criteria of progressive human evolution are qualitative: first, the range, complexity and quality or dimension of satisfactions and values, intellectual, aesthetic and spiritual, that supervene upon "survival values"; and, second, the control of mind, personality and behaviour and purposeful planning of values as means of better control of environmental resources in order to fulfil satisfactions and values of an ever-ascending order or dimension, eliciting ever higher potentialities of man.

The Dimensions of Behaviour

Behaviour is a many-dimensional interaction. There are orders or dimensions of purposefulness in the organism's adjustments. Adjustments to static and to changing conditions; adjustments through trial and error; adjustments through learning; and adjustments through symbolisation that accumulates and transmits goals, values and traditions—the results of both learning and socialization—and that is peculiar to man, comprise progressive dimensions of evolution.

Goals and values do not constitute the monopoly of mankind, but by a sort of forward reference effectively forestall and guide animal adjustments as soon as the mechanisms of mind and control of behaviour have emerged. Kroeber observes: "Recognition of the functioning and capacities of an organic species is a sort of formulation of the values generally inherent in that species. At any rate it can be that even if biologists usually are not aware of the fact and might resent the imputation of any concern with values."[1] Herrick stresses that all biologic adaptations have a future reference and seek or achieve satisfactions that are values, whether or not these are recognised as such. He remarks, "There is a hierarchy of natural values parallel with the progressive enlargement of the action system of

[1] Values as a Subject of Natural Science Enquiry, *Proceedings of the National Academy of Science*, 35, pp. 261-264.

animals in the evolutionary series. We can recognise an evolution of value in phylogeny and a similar growth of value judgments in the development of every child. Value as here defined is immanent in the organic realm as an objectively verifiable phenomenon."[1] Yet goals and values that are anticipated in the mechanisms of forward reference of adaptive adjustments, distinctive of the higher animals, play the leading role in human evolution.

The Natural History of Values

The adaptation of the biological organism, *Homo sapiens*, to his environment is the sustenance and enhancement of life in terms of needs, satisfactions and values. It is values that tell him unequivocally what he requires for his health, efficiency, well-being and cooperative behaviour—the wholesomeness, sanity and orderliness of his living in relation to his environment, physical and social. Human adjustment is another name for the process of living in conformity to a complex set of values that refine, enrich and elevate mind and society and acquire actual "survival value." Values take their due place among the other biological functions and capacities of man, and are directed towards both the environmental conditions and his inner dispositions, needs and satisfactions.

Though many values are rooted in vital activities and processes and experienced at the instinctive and unconscious level, there are no biological values *per se* in human evolution. Human evolution endows the organism with the subjective capacities of creation, evaluation and transformation of values and freedom and responsibility to choose and fulfil them in every particular adjustment. Values have played a crucial role in the development of mind, society and culture, impairing, impoverishing and destroying or refining, integrating and uplifting mankind. There is a total advance of values as evolution proceeds, marking greater autonomy of the organism from the immediate context. Animal evolution as it has marched forward has produced more varied, more efficient and better organised consciousness, behaviour and goal and value-direction, achieving greater freedom and control of the organism over the environment. Human evolution carries forward to the highest level the same trends of variety, autonomy and better organisation of mind, goals and behaviour. It is directed and governed by an organised system of values, and is marked by psycho-social rather than by genetic or biological transformation. At the psycho-social dimension, evolution works through new patterns of values and achieves new types of mind, behaviour and personality, higher degrees of organisation of society and culture. The latter are characterised by the dominance of convergence over divergence, of unity over autonomy and of transcendence over actuality. Human advance is a leap in transcending levels and

[1] *The Evolution of Human Nature*, pp. 135, 156-157.

qualities of human relations, values and value-experience. The transcendent super-structure of values differentiates human from animal adaptation, and is the co-product of human mental evolution and discovery, accumulation, evaluation and transmission of human experiences, ever moving towards interchange with that which the universe offers.

At first biologically and physiologically, and later on rationally defined and appraised, values in mankind rank themselves in a "natural" hierarchy according to their permanence, universality, transcendence and creative, multiplicative nature, and become directive agencies of the evolutionary process itself. These keep human evolution always on the stride towards something ever richer, stabler, more harmonious, more universal and more transcendent.

Human adaptations and values are to be considered not as "closed systems", approximating towards static equilibrium, but as "open systems," constantly moving towards greater wholeness, orderliness and transcendence in dynamic interaction with the environment, physical and social. In an environment in which there is only one potentiality, values are dead, and adjustment and evolution come to a halt. The human social situation is one in which there are undefined and unlimited potentialities. Since value-creation and value-experience are associated with the capacity to adjust the actual and the potential, and the existential and the transcendent to one another, the variety, range and wealth of human values, like those of human potentialities, know no bounds. The discovery and experience of fresh values consists in reconciling not only facts and values, but also various dimensions and qualities of values with one another in the on-going social relations and processes. Human potentialities with associated satisfactions, meanings and values are continuously enlarging and transcending on every dimension.

The Meaning of Human Environmental Control

Man's capacity for conceptualisation, symbolisation and learning, and his creative mental interchange with the external heritage of culture that garners and transmits values, traditions and experiences from generation to generation enable him to modify his nature, stretch his potentialities and acquire a degree of control over the environment that can never be achieved by the animal. The increasing variety, range and sureness of control of the environment differentiate human from animal evolution. Man's independence of, and control over, the environment with associated development of individual versatility and uniqueness of adjustments within the species lift human evolution to an altogether new dimension.

Yet man's manipulation of his physical and biological environment works within the limits of the ecological laws of correlation, balance and harmony of living communities within the region. There is a subtle, fine and intricate balance established between plant and animal communities (biocoenoses) in every ecological area of the earth, between the herbivores and

carnivores of different sizes and ways of living, in every parcel of meadow, forest or lake. Complex, multitudinous and ramifying threads of "the web of life" bind together the different parts of the living world, surrounding, interpenetrating and overreaching the lives of single species and organisms. Any far-reaching disturbances of the delicate system of ecological linkages in a certain region become detrimental to such fundamental economic pursuits of mankind as agriculture, forestry and animal husbandry. The notions of wholeness, solidarity or symbiosis as applied to the vast harmonious ecological communities have, indeed, great practical significance for the stability and continuity of human civilization. Just as wild nature is in a state of ecological rhythm and equilibrium, and shows reciprocal interdependence, self-regulation and adaptation to "biotic" interferences or pressures, so the external heritage even of a technological culture should maintain, and not recklessly disrupt, the ecological wholeness. A one-sided exploitation of the natural and biotic potentials of the land brings about ecological disaster. From another viewpoint, the cycles of epidemic diseases, which may be considered as ecological rhythms between human, insect and carrier populations, have their obvious impact on human hygiene and welfare. Not until we reach the unity of the whole of life on the planet that ecology demonstrates can man's environmental control be free from the risks involved in his constant pressures and interferences with the stream of life maintaining itself in dynamic equilibrium through the cycles of the bio-elements.

With the human species evolution along with control over environment has reached a new stage. The natural selection of races and individuals through the slow mechanisms of adaptation and genetical stability and variation is supplemented and gradually outstripped by the quicker processes of individual acquisition of knowledge and tools, transformation of the environment and transmission of the external social heritage—man's acquired environment of techniques, traditions, values and culture. Through the latter he achieves better and better adaptation, symbiosis and orderliness with the physical environment, and as he does so a new form of evolution emerges.

The On-going, Expanding Stream of Life and Humanity

Bio-psychologically constituted as he is, man can only advance if he lives and strives as a part of the environment, the group, the society, the culture, the unlimited social milieu which comprise the whole. Whitehead is one of the first among the philosophers to generalise the idea of the human environment as a field of relationships with other living individuals, each living his own life, directly felt in experience. From the biological discovery that the living body is not one entity but a "vast society of cells," he comes to the conclusion "that the primary non-human datum of human experience must be cellular activity, objectified without

distinctness as to individual cells and instinctively taken as an index of conditions outside the bodily system, an index whose general reliability is due to evolutionary adaptation." This explains how man apprehends sub-human reality and is causally influenced by it. "He cannot but be influenced by what he directly even though indistinctively intuits."[1] Man grasps the environment and the society as one including himself in the whole. The patterned nexus such as the environment, the society and the ever-expanding cosmos as the society of societies derives its sole principle of unity from the bare fact of mutual immanence.[2] John Dewey has also stressed that "the social in its human sense, is the richest, fullest and most delicately subtle of any mode of actual experience—the widest and the richest manifestation of the whole." He observes: "Associated or conjoint behaviour is a universal characteristic of all existences. Qualities of associated things are displayed only in association, since in interactions alone are potentialities released and actualised. The manifestation of potentialities varies with the manner and range of association."[3]

The social "transaction" according to him is constant, forward-oriented and ever expansive in its unfoldment of human participation, values and potentials. A similar emphasis of the dynamic, creative process of social interchange is illustrated by Royce's "Community of interpretation," Peirce's "Community of mental action" and Felix Adler's "Infinite society." Man always lives, matures and fuses himself in society, and Nature is a complex of societies functioning at different levels. He apprehends, speaks and behaves properly when he is linked dynamically and creatively with his fellowmen. The normality of his mental functions and development rests on his living in fellowship, on his social impulse, feeling and sentiment entering into the core of his motivations, symbols and values. Human nature is only possible because mankind is a society. It is this society of societies which prepares and educates man for his wholeness and transcendence in the brotherhood of the species, or in the ideal self. Man's mental inadequacy, unstability and insecurity are all rooted in his thwarted and imperfect wholeness and self-transcendence in his relationships with fellowmen in expanding circles of love, altruism and cooperation. The development of human values, the challenge of human culture, consists, to be sure, in man's perfection of fellowship with man, in his participation and transcendence in the general evolutionary stream of Life and Humanity-as-a whole of which he is a bubble, pool or vortex. Such wholeness or transcendence of human social living is based also on wider bio-ecological cooperation or symbiosis, maintaining the on-going and expanding stream of life in the continuous flow of matter and energy through different species of organisms that constitute the hierarchy of living systems.

[1] Charles Hartshorne in *Whitehead and the Modern World*, pp. 36-37.
[2] Whitehead: *Adventures of Ideas*, p. 260.
[3] Social as a Category, *The Monist*, V, 38 : 2.

The Global Environment and Evolution of Man

All this implies that there is nothing fixed or definitive about human nature and environment that have vast further potentialities of advance which are yet to be reached. Such advance is connected less with the natural selection of man's genetical equipment (biological evolution), and more with his non-biological social heritage (psycho-social evolution) that is brought into ever greater harmony with his possibilities at the social or conscious level imbueing him with an ever stronger social impulse and feeling. Man consciously maintains and plans the biological continuity of his race and the social continuity of his traditions, values and culture in a manner which no other animal can. Alone among the amimals he achieves a global pattern of thinking, feeling and behaviour. Human evolutionary advance enlarging the horizons of organic evolution establishes a continuity of the global heritage of mankind. To this world-wide psycho-social environment man must adjust himself in order to live and thrive. He relates his own traditions, values and life experiences with those of mankind and accumulates and transmits them to his posterity. He links himself with fellowmen of his enlarged world-wide environment, irrespective of their race, region and culture, and with the cosmos-as-a whole by feelings of identity and empathy. These widening social feelings, values and aspirations now belong to his long-range adaptedness, and comprise the trend along which his advance now proceeds leading to greater actualization of his desirable potentials. This is his evolution in the "right" track. The enlargement and deepening of human social and cosmic feelings and values have now become of prime significance for his survival and progress.

The fundamental evolutionary process shows a grand progression of successive stages of development of the earth, life and consciousness in their totality. There are progressively the geological unity of the earth called the "bary-sphere," its biological unity called the "bio-sphere," and its intellectual and spiritual unity represented by the common global traditions, values or culture which Chardin calls the "noo-sphere."[1] Evolution can be defined and evaluated in terms of its trends and possibilities rather than in terms of the origins. With the emergence of mind, values and culture the earth takes a new forward leap, and cosmic evolution enters a new phase. The transformation of the earth which has become the world-wide human environment must have to be interpreted now in terms of the progressive unification of the earth and cosmos by the self-transcending values, personality and culture of man governing and directing the consciousness of entire mankind. There is an irreversibility about the extension of the concepts and feelings of man and the solidarity of the race. Just

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[1] Chardin: *The Phenomenon of Man*, pp. 180-184.

as man cannot isolate himself from his group or community, biologically, socially and morally, without suffering personal disorganisation, atavism or regression, so the unity of mankind can no longer be defeated nor checkmated without a catastrophe. The fundamental principle of cosmic evolution makes mankind-as-a whole its necessary culmination.

Human evolution, continuing and deepening biological evolution in another dimension, is an unceasing creation, not a static achievement, a continuous triumph over all that is anti-social and anti-cosmic in human life, personality and culture. It finds its social and cosmic dispositions, feelings and value as it goes. Humanity has an "open" future in both individual and evolutionary advance in the direction of human and beyond-human social feeling.

The scientific method as applied to the evolution of man and his history and values reveals, however, that human advance is not universal nor inevitable. Human evolution has to be consciously sought and directed by human values and culture, increasingly and more closely adjusted to the realities of man's social and cosmic destiny—the adaptedness of personality, values and culture to mankind-and-cosmos-as wholes. From the viewpoint of human possibilities, values and culture are all important factors of human behaviour through which it reaches a beyond-human, cosmic dimension.

The Problem of Successive Dimensions and Wholes

At each level or dimension of cosmic, organic and human social evolution, there are problems of wholeness, of integration and organisation of relations, of dynamic "transaction," of parts and processes, of transcendence. We can neither reduce the biological to the physical-mechanistic nor the psycho-social to the biological order or dimension of principles and laws. The key-words in the conceptual frame-work and organisation of modern sciences are wholeness, not specificity of pattern and movement, unity not diversity, and "dimensionality," not "reductionism."

Today we seek scientific explanation in terms of parts and wholes, lower and higher dimensions of any pattern, system and organisation. There is search for universal models, principles and laws which apply to successive wholes, systems and organisations at different levels or dimensions, for what is called "isomorphic" or structural uniformity or order manifest in processes and relations studied by the various sciences, often independently of one another. A "general theory" of human evolution will synthesise the problems of wholeness and dimensions of organising relations resulting from the dynamic interchange of social processes and values emerging in the various social sciences. Instead of studying man and the society or culture and their interactions from various facets and dimensions separately, it studies social life, relations and values as a unitary whole, and attempts to clarify their natural coherence, organisation

and dynamic interpenetration. It will be an integral, "formal" part of a new discipline which Bertalanffy calls General System Theory, concerned with the formulation and derivation of those principles which are valid for "systems" in general.[1]

Interpretation of Human "Transactions" in Terms of the Highest Wholes

Recently several thinkers, such as Novikoff, Needham, Herrick, Cameron and Feibleman have concerned themselves with the concept of integrated levels or dimensions in the various sciences. The "creative" feature of causality is recognised, and the perspectives of sciences are immensely widened when the lock-step of traditional causal sequence in which every event is clamped to the preceding and succeeding event with rigid unalterability is broken. The living organism does not react identically to apparently identical stimuli. The act of response alters subsequent responsiveness, while it is neither random nor lawless. Creativity, as Herrick points out, is exhibited in some measure by every mechanism. It is manifested at successive dimensions of integration throughout both inorganic and organic realms, and it culminates in human purposive behaviour, constructive reasoning, valuation and transcendence. He observes: "The transition from one level to another as from lifeless to living and from unconscious to conscious action may appear to be abrupt and discontinuous, but underlying this appearance of saltatory change there is an unbroken series of causal connections."[2] A sort of super-science is now emerging dealing with the integrative dimensions and the uniformities, processes and laws found in the successive series of dimensions, of parts and wholes. Beyond the older hypotheses of mechanism and vitalism that represent contrasted facets of the explanation of organisms in terms of lower and higher dimensions respectively, we have gone to the recognition that the physical and biological dimensions are interdependent and interpenetrate each other, and that any organisation belongs to its highest dimension in some peculiar mode and has to be explained finally on this. Northrop has pointed out that "there are different scientific methods for different stages of inquiry and the method which is scientific for one stage may be quite unscientific at a different stage. It is the problem that designates the method, not the method which designates the problem"[3]. The cause and effect of physico-chemical reactions in the world of physics; the sensitivities and chain reflexes that direct the organism towards the source of stimulus in the world of biology; the goals, motivations and symbolic or learned behaviour in the world of mind; and the striving, realisation and transcendence of values in the world of personality and

[1] Bertalanffy: An Outline of General System Theory, *British Journal for the Philosophy of Science*, 1950, also Feibleman: Theory of Integrative Levels, *Ibid*, 1954.
[2] Herrick: *The Evolution of Human Nature*, p. 111.
[3] *The Logic of the Sciences and the Humanities.*

culture are illustrations of characteristic patterns of behaviour at different dimensions. The complex systems of personality, values and culture call for interpretation at the highest dimension which man has reached in the evolutionary process.

The Human Organism—Function—and Environment; Man—Behaviour—and Society; Social Person—Status—and Group; and Personality—Values—and Cosmos are dealt with by the biological, psychological and cultural sciences serially arranged in a hierarchy of dimensionality. The theory of "transaction" or dynamic interchange between the three basic elements of biological and social reality is grounded in the epistemological presuppositions of Dewey and Bentley. The triangular perspective within which the fundamental aspects or facets of the social reality can be studied from within and in their reciprocal interdependence is also cognate to the Gestalt theory that like the former goes much beyond psychology and is related to phenomenology. In the dynamically organised social "field" we reach a universe of discourse in which the fusion of boundaries between person and world or cosmos is consciously or intuitively understood and acted upon. Man not only accepts his social universe, but projects himself beyond, and transcends it through his meanings, expectancies and values. If we agree with Cohen that the truth of a proposition holds only within its proper universe of discourse, the dual concepts of acceptance and projection, self-involvement and self-transcendence are indispensable in the interpretation of social evolution. Shared sentiments, meanings and values as well as self-transcendence are involved in the social, which is something more than merely physical and biological. The collaborative or inter-disciplinary science of human evolution demands that the current specialities should be governed by explanation in terms of the highest whole and dimension of the organisation which man reaches in evolution. Although man as an organism adapts himself within certain biological limits to the environment, although his behaviour conforms to certain psychological principles of response to the objects of the environment and to fellowmen, and although as a social being his accrual of role and status takes place in group and institutional life, we must still consider the fact that his behaviour follows certain patterns or uniformities called values, norms and ideals common to members of the same environment, society and culture. Any "general" theory of human evolution must be concerned with the "open system" of Personality—Values—and Culture in their reciprocal interdependence. This represents the qualitatively highest dimension or the most efficient pattern of performance which the human animal achieves.

Social Philosophy Grounded in Modern Biological Philosophy

All the biological, psychological and cultural disciplines will have to come to terms with one another, and achieve a common focus at the level

of personality, values and culture. Such concepts as symbolic and learned behaviour, conditioning, canalisation, goals, values and norms, their internalisations as conscience and faith, and cultural premises, beliefs and imperatives will gain in scope and clarity in the context of a "general" theory of human evolution. At the psycho-social stage of evolution, the unique personal qualities of human symbolism, values, morals and norms are as significant as the processes of cultural conditioning and canalisation that establish certain common patterns of behaviour in a specific social structure and culture. The interrelations of the distinctive qualities of the individual personality, the forward direction and transcendence of values and the intimate but universal norms and imperatives of human culture must have to be clarified in the context of progressive social evolution. It is these problems which define the method of any discipline dealing with man and his evolution, values and culture. The natural science method cannot aid us in understanding and interpreting these problems by forcing them into the level and framework of the lower, coarser and simpler physical and biological processes.

It is from his supreme values and transcendent norms that the mechanisms and processes of human adaptation, behaviour, status and culture in the various stages of the historical process have to be explained. These patterns are common to men of a particular region, society and culture, and are not generic to the human species. Yet *Homo sapiens* is the place where the entire evolution of the beliefs, motivations and values of mankind illuminates itself. As the end-product of civilization, he becomes the guardian of transcendent or cosmic evolution. There are super-personal, super-cultural and supra-rational intrinsicalities and values that elude adequate analysis, but are possible instruments of progress in the universe at large. Modern vitalism and evolutionary naturalism are narrow and limited in their vision. As philosophies these bring out results that satisfy the emotional needs of the tiny parasites of this insignificant planet in the universe, but show, as Bertrand Russell aptly remarks, " a lack of a sense of proportion and logical relevance."[1] Man is always open to the universe, and strives after creating and maintaining ever greater wholes, ever more comprehensive and transcending values and value-experiences. His cosmic intuition reveals the foundations of the cosmic and human Being which subsists in an endless, creative process of Becoming.

The theoretical constructs of a mechanistic universe formulated in terms of matter and energy by Newton, Locke and Descartes in the 17th century nurtured atomism in classical psychology and social sciences and metaphysical individualism in the thought-pattern, and were a prelude to the massive developments of standardisation and technicalisation of modern

[1] *What I Believe*, p. 23.

culture[1]. In the present age, we come increasingly to realise, as R.N. Anshen observes, that "the conception of wholeness, unity, organism is a higher and more concrete conception than that of matter and energy, and that science itself must ultimately pursue the aim of interpreting the physical world of matter and energy in terms of the biological conception of organism."[2]

The Wholeness and Transcendence Tendencies in Nature and Life

The vast universe is basically constituted of only three particles, proton, neutron and electron. But they do not move in isolation but conjointly and cooperatively. They pair and fuse, and form millions of atoms and molecules, composing stars and nebulas, gas, liquid and solid matter as well as living system, all moved by an integral, cooperative directiveness. The second law of thermo-dynamics shows how the universe is a fundamental unity not chaos, and exhibits orderly integration and direction. It is in the living system, and in particular the human social system that the exercise of a coordinated, cooperative, directed effort has attained the highest conscious dimension. The universe comprises of millions of entities, patterns and systems that show unity emerging from diversity, and complexity emerging from simplicity of structure and function through the great cosmic law of integral directiveness. Each entity, pattern and complex arising out of a combination of the three basic particles into the atoms, of atoms into the molecules and of molecules into the protoplasms, shows the emergence of new qualities or properties distinct from those of the isolated components. It is the directiveness of cosmic evolution which brings forth new qualities and a new dimension of existence step by step. Each forward step has an element of surprise comprehensible only when looking back.

Man who has grown with the cosmos illustrates the acme of cosmic, orderly directiveness through his sense of transcendent values that has now taken charge of cosmic evolution. To the directiveness that seems fundamental everywhere in the cosmos from the laws that govern the expansion and contraction of the galaxies to the principles of homeostasis and valuation, man gives the reality of conscious purpose. The expanding evolution of the cosmos with its successive patterns from the basic particles to the congeries of atoms and molecules that gather into inanimate and animate systems and organisations is now to be seen as part and whole, and as a progressive pattern of different orders, levels or dimensions. The relatively static pictures of the cosmos of the last decades are now discarded as inadequate and distorted. On the unity and order of the cosmos-picture the new cosmography superposes breath-taking notions of immeasurable time and space, and also the possibility of existence of major

[1] Compare Hocking: *The Coming World Civilization*, pp. 21-28.

[2] Preface to the volumes published in the *World Perspective* series.

kingdoms of life in other inhabited planets dispersed throughout the cosmos. Man not only cultivates a new cosmic humility, but can conceive of a yet higher pattern and quality of life, mind and values, blossoming forth elsewhere due to favourable circumstances of cosmic radiation, planetary evenness of conditions or the much larger time afforded for organic evolution. He can accordingly emulate and strive for much higher cosmic, transcendent truths and values, the potentialities of which are only faintly glimpsed in his peripheral, terrestrial habitat. Contemporary man's proper cosmic adaptation calls for the arousal of new hidden spiritual resources and capacities. Obviously the presence of superior organisms elsewhere in the cosmos sets before mankind on this planet a new transcendent, cosmic goal for itself.

A Second Copernican Revolution in Human Thinking

Human mind and values evolved by the mother-cosmos await higher consciousness and values, and yet higher consciousness and values from the cosmos. Everywhere the notions of dimensionality, directiveness, wholeness and transcendence dominate. According to Whitehead, "Science is taking on a new aspect which is neither purely physical nor purely biological. It is becoming the study of organisms. Biology is the study of the larger organism, whereas physics is the study of the smaller organisms."[1] The scientific scheme is being recast and founded upon the ultimate concept of organism, which, he says, is "a unit of emergent value, a real fusion of the characters of eternal objects emerging for its own sake." Whyte postulates the operation of a "formative tendency" in Nature. Karl Heim considers that a "wholeness tendency" should have primacy in modern philosophy. A cognate "transcendence tendency" in Nature and Life may also be postulated focussing a fruitful interchange of biological and humanistic studies in modern thought. The new concepts of hierarchical order, wholeness, transcendence and organisation into ever higher and more complex integrations which characterise the modern scientific interpretation, and which have been most significantly demonstrated in the world of life, offer an enlarged, objective definition of the meaning, value and direction of evolution. The synoptic vision of the organic and spiritual wholeness and transcendence of man, and his central role in the evolutionary process, grounded in the synthesis of values and experiences of different dimensions dealt with by apparently separated branches of knowledge, may initiate a new dynamic reciprocity between scientific and philosophical disciplines. The outcome may be a second Copernican revolution in the history of civilization.

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[1] *Science and the Modern World*, pp. 150-157.

CHAPTER III

HOMEOSTASES AND VALUES IN EVOLUTION

Extension of Field Analysis from Physics and Biology to the Social Sciences

The concepts of "field" and "transaction" are now regarded as basic in defining life, mind and society as a hierarchy of "open systems." All organisms interact or "transact" in their limited fields that are organisations of relations and activities, internal and external, defined as integral functional systems. The "field" analysis has now spread from Physics to Biology and from Physiology, Psychology and Psychiatry to all the Social Sciences. From the logical view-point the "field" can be defined when we can refer to certain mutually interacting objective factors that maintain an enduring total pattern articulated or structured as a functional whole. Accordingly, it is the "field" which indicates the factors and processes essential for the discovery of the laws governing the structure and function of the particular organisation. In biological evolution the "field" refers to the interacting, organised system of Organism—Function—and Environment. The pattern or organisation of Life embraces the whole Organism—Function—Environment relation; none of the factors involved can be defined or understood without reference to the others.

The Constancy of the Field in Human Physiology

The life-process, though focussed in the organism, extends beyond the body. L.J. Henderson has shown that the structure of life is no mere question of the interdependence of all that lies within the body; it is the question of a balance, the interstimulation which goes on between the inner and outer forces. The "field" in organic evolution in general envisages a complete living, growing and functioning system that achieves basic constancy and integrity in its environment. As evolution steps forward, new patterns of stability and balance emerge adding new features and new directions of organisation. In mammalian evolution the "field" comprises Mammal—Homeostasis—Environment. In Human Physiology the "field" refers to the comprehensive scene of internal and external activities that regulate the human body's complex adjustment under specific determining and limiting external conditions through all the stages of growth.

Homeostasis and Evolution

Claude Bernard introduced into physiology the seminal principle of the "constancy of the inner environment." Bio-chemists and physiologists of this generation have applied this principle in various ways to

the rhythm of life-processes maintaining a relative stability and balance of the systems of the body. The maintenance of constancy through complex, co-operative internal functions and external activities is called by W.B. Cannon "homeostasis" which implies 'maintenance of stability.'[1] Organic evolution maintains, improves and expands the organism's internal adjustment and resistance to the powerful alternative forces operating both from within and without. The mechanisms and agencies of homeostatic adjustment that maintains the status quo of the organisms, especially their chemical composition, are largely self-sustaining and self-regulating, automatic. Cannon characterises this as "the wisdom of the body." Three basic biological ideas pervading every aspect of biological organisation are focussed by homeostasis. First, homeostatic mechanisms show the phenomenon and organisation of control with a tendency towards dynamic equilibrium and periodicity of action as fundamental for all patterns of life. W.S. Beck observes in this connection: "It is homeostasis—the effort of the organismic machine to restore its equilibrium whenever disturbed—that gives the organism an appearance of purposive behaviour, since these activities seem directed toward a future steady state. In contrast to the problems of heredity and reproduction, those in this area of biological science are the subject matter of such familiar fields as endocrinology, physiology, immunology, bio-chemistry, neuro-physiology, and so on. Each of these is concerned with the mechanisms of self-regulation at one or another level of organisation, and each still harbours great unsolved problems—for example, it is not known how hormones control metabolism or how antibody specificity is achieved. But the inescapable common denominator in all of these problems is the phenomenon of *control.*"[2] Secondly, homeostasis shows that the organism in order to maintain its internal constancy and defend life against the second law of thermo-dynamics somehow retains "the power of *choice* over what goes and what stays." Thirdly, homeostasis increases and improves through internal and external vicissitudes and the physiological responses to stress. Pick has shown that homeostatic mechanisms elaborate and change from fish to man. It is not only in the organic mechanisms of homeostasis themselves that the evolutionary elaboration occurs, but also in their potentialities for widened behavioural relationships through ontogeny. Natural selection guides organic evolution in the direction of a more adequate homeostatic control in a given environment. Whatever biological agencies and processes contribute to the maintenance of dynamic homeostatic continuance and expansion are "functional" and "valuable", and reveal the potentialities of life at its different dimensions. The concept of *values* is derived from the basic homeostatic functions of self-maintenance, control and directive-

[1] *The Wisdom of the Body.*
[2] *Modern Science and the Nature of Life*, p. 248.

ness towards dynamic equilibrium that characterise all living systems. Only the function and organisation take on a new dimension in the upward surge in evolutionary progress.

Values are Social Homeostatic Controls

From Cannon comes the valuable suggestion that in the complex aspects of human social evolution, institutions and cultures contribute to the achievement of homeostasis.[1] Human evolution in the psycho-social field or scene may be interpreted as the complex interchange or transaction between Man—Homeostatic Controls (Values)—and Culture. Values arise during the course of evolution of the hierarchy of "open systems" for the maintenance of dynamic constancy, growth and expansion. Values, from the biological viewpoint, may be defined as the generic laws of human evolution and control contributing to the dynamic homeostatic equilibrium, integrity and expansion of particular "fields" revealed by the various social sciences at different dimensions of adaptation. As the consequence of the evolutionary processes operating through millennia, the human mammal has acquired a thermostable state, a constancy in the acid-alkali relation and sugar concentration of the blood, establishing a delicate balance between internal conditions and disturbing or limiting factors of the environment. The role of physiological homeostasis is that it releases the higher functions of the brain-mind for solving more complicated problems of internal and external adaptation and homeostasis.[2] With evolutionary progress man, dominant among the vertebrate mammals, has required and developed exceedingly complex internal and external agencies and processes of organic and extra-organic balance and control. The mechanisms of personality, values and culture, operative both internally and externally, establish his goals and directives towards the dynamic equilibrium that is so indispensable for his survival and advance. Such mechanisms and goals are, therefore, homeostatic, and achieve a reconciliation in the psycho-social dimension of balance and growth, integrity and change, security and adventure, control and freedom. These are the major aims of human evolution and conscious social selection, both in the individual and in society.

The Dimensions of Homeostasis

Homeostasis is, accordingly, of several orders or dimensions: physiological, psychological, institutional or moral and ideal or symbolic. It rises from lower to higher levels of adaptation, organisation and efficiency, a progressive series which culminates in human personality, values and

[1] The Evolution of Homeostasis, *Proceedings of the American Philosophical Society*, 1954.

[2] The Body Physiologic and the Body Politic in Anshen (Ed.): *Science and Man*. See also Emerson: Dynamic Homeostasis: a Unifying Principle in Organic, Social and Ethical Evolution, *The Scientific Monthly*, vol. 78, 1954; and Homeostasis and Comparaison of Systems in Grinker (Ed.): *Towards a Unified Theory of Human Behaviour*.

norms. Social homeostasis is not the chemistry of interrelations of internal operations, but is still homeostasis with a fundamental tendency towards dynamic balance, stability and integrity, regardless of the peculiar mode and quality it has acquired at the psycho-social level of evolution. Physiological homeostasis today means much more than the relative stability of separate features such as temperature or contents of water, sugar, salts and proteins in the body. Homeostatic effects are "web effects" with many "feed-backs", and imply the maintenance of the relative constancy of interrelations and the structural wholeness of the living, growing organism as a balanced individual system.

Psychological homeostasis comprises several levels. First, there are the integration and coordination of the senses so that these work in harmony for the production of a relatively stable and compact self-awareness dependent on the body-mind's interrelations with the environment. One sense may become amplified to offset the disability or loss of another. Second, there are the integration and control of the functions of thinking, feeling and volition, so that there evolves a stable, consistent and integrated behaviour pattern in harmony with the environment. Man's motivations and behaviour are consciously or unconsciously directed to the maintenance of an inner stability and balance free from the storms and stresses of impulse and emotion, just as physiological homeostasis implies the relative constancy of the body, free from the unpredictable changes of the external world. The integration of impulse and reason, lower and higher desires and values, is homeostatic. Freud has developed the notion of "constancy" of organismic and mental states established through drive gratification and of stress and frustration in its absence. Thirdly, there are the integration, control and maintenance of one consistent and constant self-hood or personality. Guthrie maintains that human action occurs only when there is a threat to the inner stability of personality.[1] Gardner Murphy delineates the picture of personality as involving a stable equilibrium in which there are organised systems of behaviour with certain definite limits of variability, perceptual constancies and the anxiety-temptation balance.[2] Human personality is a stable, coherent system that does not permit excessive change of parts without destroying the value of the whole. On a profound disturbance of balance the whole person may be organised in a different way with clusters of interdependent traits achieving a new unity. The organisation of personality with its hierarchy of balances and constancies of mental and behavioural processes of graded degrees of complexity is homeostatic. As a matter of fact personality may be considered as standing at the apex of the holistic and homeostatic Mammal—Homeostasis—Environment

[1] *The Psychology of Human Conflict.*
[2] *Personality*, p. 637.

and Man—Behaviour—Situation system.[1]

Social or institutional homeostasis is illustrated by the dynamic equilibrium and periodicity of operation of forces in the vast ramifying cultural network of production and distribution of goods and services that comprises the internal environment of the body politic. Classical economists stressed "natural" Economic Harmonies (Bastiat), and analysed the equilibrium of the forces of demand and supply in the market that establish static equilibrium in the body economic. Modern economists now have replaced the older notion of static equilibrium by that of dynamic equilibrium, defined in terms of changing patterns of propensities to consume and save, capital accumulation and investment, costs and satisfactions. The analysis of the total behaviour of organised economy in terms of moving rather than stationary equilibrium in dynamic economics closely resembles that of bio-chemistry and physiology. The dominant concepts in modern economics, as of bio-chemistry and physiology, are those of dynamic stability and balance of the organisation achieved through processes of self-maintenance, self-regulation and self-restoration.

No body politic can survive that cannot establish or maintain the stability of its internal environment .based on a proper coordination of production, distribution and consumption and functional integration of various groups, institutions and individual roles. Only a stable status-power-prestige scheme, a proper ratio of awards and functions, and an efficacious system of social control, internal and external, can maintain the on-going circulating stream of material and immaterial goods and services which provide the conditions of social living.

Criteria of Homeostatic Equilibrium in Society

Homeostasis within the body politic may be physical or symbolic. It may be a mechanism of discipline, repression and control or of expression, stimulation and evocation. Not only do social relations, groups and institutions, like human tissue systems, maintain a homeostatic balance and swing back to a poised normality after upset or tension, but they also undergo systematic progressive change. There is an opposition of forces and functions which is called Dialectic in the social process between inhibition and expression, freedom and determinism, status and mobility through which homeostatic integrity and harmony are constantly upset and constantly restored. Through the dialectical march of social opposites and modes, society achieves a new pattern of equilibrium. As in organic evolution, so in psycho-social evolution, mutations or changes occur on a base of extreme stability and integrity within the organisation. Different sectors and dimensions of social life accordingly achieve optimum homeostatic conditions and interrelations through a balancing of opposed functions.

[1] See Teitelbaum: Homoestasis and Personality, *A.M.A. Archives of Neurology and Psychiatry*, 1956.

These may be defined by the criteria of equality of income (economic life), civil equality (political life), justice (legal relations), altruism (moral life) and self-transcendence (religious life). A fully integrated and balanced social life depends upon the smooth working of manys ocial homeostatic control mechanisms—not only those of law, government and public opinion, but also of other means of social control, such as education, religion, literature and the fine arts, that play even more significant roles in contributing towards the wholeness and balance of life of the individual and the integration and harmony of society. All these have *ethical* meanings. Dynamic homeostasis within society is an ethical process that develops from ecological and economic equilibrium to social integration, and thence to spiritual at-homeness. It implies an advance in the ethical principle in individual homeostasis from prudence through loyalty to reverence, and in social homeostasis from reciprocity through justice and equity to love and sharing. Social or institutional homeostasis is the prime requisite for the promotion of the ideal or symbolic homeostasis, which contemplatives define as spiritual at-homeness with the universe. From dimension to dimension of evolution, the processes of life, mind and society achieve the dynamic homeostatic constancy and expansion of the environment. Cosmic mind and values realise the most comprehensive wholeness and the most extensive homeostasis that personalities and cultures can build up through symbolic homeostatic systems.

Homeostatic Norms at Different Levels of the Social Environment

Values, then, are oriented and scaled in terms of the homeostatic conditions and controls of society at different levels, dealt with by the various social sciences. The human body has developed mechanisms of great variety and specificity that are set in motion in a chain, and keep it on an even course in spite of conditions which might have been deeply disturbing. Such complementary adaptive interactions are true of the homeostasis of blood sugar, oxygen supply, acid-base reactions and temperature. In the first place, one of the most striking features of the bodily structure and chemical composition is extreme natural instability. Secondly, the environmental stresses and strains are continuous. Only by the maintenance of constancy of the internal environment is survival possible. Cannon observes : "Every change in the outer world and every considerable move in relation to the outer world must be attended by rectifying processes in the inner world of the organism." The body has established a special portion of the nervous organisation with extremely sensitive indicators promptly bringing into operation the proper regulating and correcting agencies. Accordingly, the oscillations on either side of a homeostatic norm are slight. In the case of attack by invisible enemies, such as bacteria and viruses, or by visible enemies, such as fellowmen and animals, there are internal adjustments within the body appropriate for its combat and

victory. As Cannon says, "the body is unified, integrated, for a single purpose—survival." Not only survival but also efficiency are the consequences of the preservation oft he homeostatic norms. In social homeostasis values and norms are similarly established and fostered at different dimensions, for security, efficiency and balance of the body politic, and of its various sub-systems. The homeostatic norms of the social organisation orient themselves in a "natural" scale, order or hierarchy—generic, "pan-human" value coordinations that underlie the stability, balance and orderliness of different societies and cultures in different stages of evolution. This is shown in the following table:

1 Biological and Social Sciences at Different Dimensions	2 Homeostatic Balancing of Opposed Functions	3 Homeostatic Norms (Values)
1. Physiology	Uniformity of Internal States *v.* Variation under Stress.	Homeostasis.
2. Human Ecology	Exploitation *v.* Conservation of Resources.	Survival and Continuity of Society.
3. Psychology	Drive *v.* Drive reduction, Inhibition *v.* Facilitation, Conscious *v.* Unconscious.	Integration of Behaviour and Personality.
4. Economics	Costs *v.* Satisfactions.	Equality of Income.
5. Sociology	Status *v.* Mobility	Solidarity.
6. Political Science	Freedom *v.* Submission	Equality.
7. Jurisprudence	Civil rights *v.* Order	Security.
8. Social Work	Economy *v.* Security	Altruism.
9. Ethics	Goodness *v.* Evil, Impulse *v.* Conscience, Egoism *v.* Altruism, Freedom *v.* Determinism.	Harmony.
10. Religion	Self-acceptance *v.* Self-transcendence	Spiritual At-homeness.

The fields of life rise to greater complexity and higher dimensions, including not simply man but the society, culture and mankind-as-a whole. Man adds to his internal environment his external, non-biological homeostatic environment of his society and culture. Both insect and human societies show a perfection of division of labour, specialisation of skills and aptitudes, integration and coordination of social functions and social homeostasis. In the former these rest on the genetic evolution of insect species and polymorphism. In the latter it depends upon the psycho-social evolution of human communities. Man's external homeostatic heritage is transmitted from generation to generation, displaces the genetic structure as the sieve of selection and survival, and guides behaviour, growth and evolution. This involves a purposeful and qualitatively distinct pattern of homeostatic living adopted by man at the level of psycho-social evolu-

tion. Groups, societies and cultures develop ever more integrated values, "wholes" or homeostatic systems of organised relations, behaviour and values, in and with reference to which individual goals, purposes and obligations arise and are integrated and ordered in a system of "natural" hierarchy.

The Optimum Relation between Control and Freedom

The social mechanisms of the imposition of the "requiredness" of homeostatic obligations and norms are represented by the regulation of habits and patterns of behaviour through the procedures of canalisation and conditioned responses. In the body politic this closely corresponds to the functions of the brain, the homeostasis-making organ *par excellence*, with its highly developed and intricate frontal association areas and ramifying integrative nervous mechanisms, coordinating and regulating the autonomous homeostatic mechanisms. Claude Bernard's and Cannon's ideas on homeostasis have been the basis of construction of a bio-physical design or model of the human brain in the hands of Ashby and other physiological psychologists.[1] The human brain expresses and communicates in symbolic equation both immediate as well as distant and forward-oriented homeostatic controls for both internal and external consistencies and balances. Human culture does exactly the same through more complicated symbolic oppositions that raise homeostasis to ever higher levels.

As in the body physiologic, so in the body politic, the principle of homeostasis achieves an optimum relation between control and freedom. As Cannon remarks, to the degree that homeostatic control was perfected in the myriads of millennia during which vertebrates evolved, man in his complex external environment has attained freedom of action.

Physiological Homeostasis as Indicating the Trend of Human Evolution

Physiological homeostasis indicates the trend of the future evolution of man. First, the physiological principles of preference of security to economy, and of stability to high tempo demand cultural recognition. Civilization has its myriad programmes of defence against enemies including insects and microbes, against unemployment, poverty, and disablement due to disease and physical handicap, and against the inevitable accidents and misfortunes of life. But no civilization has been able to reduce or regulate the prevalent excessive tempo of life and wastefulness of energy. Societies must also discover mechanisms of reducing and redistributing surpluses among the have-not individuals and peoples just as the body discards excess of water, salt or sugar, before the approach of derangement of a stable state. Many societies do not also possess wide margins of safety permitting unusual demands and crises found throughout the organism. What human communities have developed such mechanisms of security such as storing

[1] Ashby : *Design for a Brain.*

fat against emergencies of starvation, as are discernible among fat-tailed sheep and camels, and among the Bushmen and Hottentots with their steatophagia-devices by which fat may be garnered without interfering with heat-loss or locomotion? Secondly, the body physiologic establishes a most subtle and harmonious balance between homeostatic control and freedom. The integrative tissues of the human brain with its intricate thalamo-cortical connections are responsible for the working of the mechanisms of reflex or instinctive and reasoned behaviour, of excitement and inhibition, satisfaction and control in the total behaviour pattern. The major ills of human social organisation are, on the other hand, due to the disbalances and maladjustments between security and economy, freedom and control, authority and submission and civil rights and order, causing profound disharmony of interpersonal relationships and the warping and malformation of personality. Both the human body and insect community exhibit optimum homeostasis and harmony between initiative and subservience; the former, at the level of bodily organs and functions and the latter at the level of social organisation. Homeostasis in both cases is genetically determined.

Because of the chronic instability of society due to the supersession of cultural by genetically determined mechanisms, some writers are inclined to reject the concept and trend of social homeostasis. Jules Henry, for instance, considers that the cogent theory of human evolution should be rooted in the hypothesis of social instability rather than stability. Man's physiological adjustments show constant changes; and biological selection always takes place, according to him, in terms of the changing stresses produced, by the perpetual instability of human social systems.[1] This is, however, a sociological exaggeration. The replacement of genetical by culturally determined mechanisms in social evolution, no doubt, has led to the multiplication of unwholesome individual mutations and abnormalities leading to chronic maladjustment and instability of human societies. These are the biological prices man has to pay for the development of his mind But neither mental nor social evolution can advance without the correction. or elimination of pernicious idiosyncrasies, aberrations and diseases. Physical illnesses and inefficiencies, neuroses and psychoses as well as different forms of personal and social inadequacy and deviation comprise serious biological drags on human evolution. The restorative and rectifying processes for both the inner world of man and the outer social environment, are, of course, psychological and cultural rather than biological and genetic. Man's organic system has evolved largely in terms of *stability* of the internal and external environment. His mental and social evolution has also been achieved on the basis of certain stability and orderliness. The body politic is sustained by a regulated tempo and rhythm of activity,

[1] Homeostasis, Evolution and Culture, *The Scientific Monthly*, Vol. 81, 1955.

social inertia and tradition maintaining through various mechanisms of social control a relatively constant homeostatic pattern of living and behaviour. These demarcate cultural and moral boundaries of persons and groups, and resist sudden and excessive alterations of routine, stability and balance, both personal and social.

Modern Diseases Rooted in Physiological Maladaptation

Many "civilized" ailments, far less frequent in the past, such as rheumatic heart, asthma, ulcer of the gastro-intestinal tract, hyper-tension, diabetes and possibly tuberculosis are "psycho-somatic" diseases springing from physiological maladaptation—the products of social stresses on the human organism. These are met with in advanced industrial communities rather than in the pre-industrial world. The heavy incidence of neurosis and psychosis in modern civilized communities is also a grave and wide-spread symptom of failure in biological and mental adaptation. This constitutes today a serious threat to man's evolutionary advance.

Biological, mental and cultural progress and advance of homeostasis go together. In fact, the principle of homeostasis provides an essential link between biological, social and mental evolution. Machine-tending, monotony and speed are too new in man's world. His physiological and mental system has not been adequately adapted to the mechanical rhythm and high tempo of modern industrial and technological civilization. In many ways the mechanised urban-industrial environment of modern man is alien to him, and he remains a biological misfit. The rigid mechanical rhythm cannot supersede with impunity the physiological rhythm of life and growth. The tempo of life, work and movement cannot be accelerated indefinitely without injury to man, his contacts, relations and values.[1] The speed of modern machines, high physical and social mobility and quick tempo of physical and mental adjustment endanger man's survival by making sudden, abnormal demands on his physiological system as well as on the organic relationships and intimacies of the primary groups and the rhythms of the social routine that moulded and shaped his mental development for successive generations prior to the industrial age. There is not only a profound lack of homeostatic balance and wholeness that is incompatible with the conditions of man's renewal, stability and advance, but there is also a continuous increase in his complexes, neuroses, depressions and mental and spiritual anxieties for which the individual can hardly be held responsible. The rapid rise of psychoanalysis, psychiatry, psychosomatic medicine, neurology and neuro-pharmocology since the beginning of this century, amply testifies to the psycho-biological imbalances and impairments of the industrial and technological age. The German physician Kart Heenrich Bauer, analysing the causes of death, observes that "at the

[1] See my *Social Ecology*, pp. 238-241

head of the list are diseases of the heart and circulatory system. Fully four-fifths of these cases are over 60 years of age. The maximum lies between 75 and 80 years of age. In many of these cases, death from strokes, coronary thrombosis or high blood pressure is merely a "modern" variation of death through failure of the circulatory system due to old age." In the lower age groups the situation is completely different. Among young people between 15 and 20 accident accounts for more deaths than all other causes together, and among males between the ages of 1 and 45 violent death heads the list.[1] Technological civilization as it makes a tour round the world apparently offers human sacrifice at the altar of the unrelenting, cybernetic idol. To decrease the speed of the machine system and industrial organisation, and to subordinate the automatism of the machine to the human elements are insistent evolutionary problems of social homeostasis for the mechanised *Homo instabilis* of the 20th century. An optimal relation between the rhythm of life and the rhythm of machine must be established for man's safety and stability. Man's homeostatic balance and wholeness are upset by monotony and repetition of work and is established by rhythmic oscillation as of rest and poise, inhibition and expression, silence and activity. Even small variations in rhythm may prove helpful for the full functioning of the human organism as the presence of tracer elements in the diet.[2]

The Biological Continuity of Homeostasis

Psycho-social evolution represents a level of homeostasis in which, first, symbolic homeostasis as well as symbolic goals, purposes and values and norms are most significant; secondly, the symbolic constancy and harmony between the internal and the physical environment of man, and between man and the physical environment *via* society and culture are perfected through the "natural" hierarchy of homeostatic controls and values; and, thirdly, man as well as his homeostases or values and environment brook no physical limits or boundaries of space and time. Art and religion achieve the most profound subtle and unrestricted homeostasis of self and the organism and the infinitudes of the universe. It is not man's biological self nor his socio-cultural self but his ideal or transcendent self which is unique for his maturation and evolution. The growing and unlimited homeostasis in the context of the enlarged, cosmic environment which he achieves is basic for his life and growth.

Animal evolution, characterised as it is by a dynamic interchange between the organism and environment, shows an increasing degree of homeostasis and purposefulness. Sinnott aptly observes: "Biological organisation (concerned with organic development and physiological activity) and

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[1] Progress in the Natural Sciences and Technology, as Seen through the Eyes of a Physician, *Universitas*, 1959, No. 1

[2] See Mumford: *The Conduct of Life.*

psychical activity concerned with behaviour and thus leading to mind are fundamentally the same thing. To talk about mind in a bean plant is more defensible than to place an arbitrary point on the evolutionary scale when mind in some mysterious manner made its appearance."[1] Mind, purpose and values are continuous throughout the evolutionary scale. Goals, purposes and values are special aspects of self-maintaining and self-regulating homeostatic functions and laws. Homeostasis is the attainment of the major instincts, goals and values of animal and man, indispensable for the maintenance of stability, integrity and balance, both internal and external.

The biological continuity of homeostasis, purpose and value is now stressed by modern biologists like Cannon and Emerson, neurologists like Herrick and Ashby, and psychologists like Gardner Murphy.[2] The dim beginnings of homeostatic directiveness, purposefulness and value-seeking are discernible in the animal kingdom. E.S. Russell postulates that organic evolution cannot be defined without the construct of "directiveness".[3] H.G. Ager has recently observed that purposeful behaviour in man is a development of a property of all living organisms as fundamental to them as assimilation and growth. The successive dimensions of behavioural adjustment show degrees of purposefulness and goal-fulfilment that merge into one another. Modern behaviour studies, indeed, now emphasise that some of the fundamental thought processes of animals resemble man's more closely than the naturalists and psychologists formerly thought. In animal it is not easy to distinguish between directiveness and true purposiveness. Sinnott remarks : "Conscious purposes grade off below into purposes of which we are unconscious. What gives consciousness its distinction at all levels may be simply that it is associated with the process of self-regulation towards an end and grows out of it. The essential fact about mind, however, seems not to be consciousness but rather the basic purposiveness that even the simplest sort of organic activity displays."[4] Many animals show a short-time purposiveness, a foresight of one or two moves ahead. Now all purposeful behaviour, as Dewey has shown, implies an integration of momentary acts and experiences with earlier and later acts into a whole or continuum.

The Unlimited Symbolic Homeostasis

The evolution of the pattern of behaviour reveals an increasing homeostatic mutuality and organisation of experiences or values of individuals and communities into "wholes" or systems. Such "wholes" or systems

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[1] *Cell and Psyche : The Biology of Purpose*, pp. 44-50.
[2] See also Kurtz : Human Nature, Homeostasis and Values, *Philosophy and Phenomenological Research*, vol. XVII, 1956-57.
[3] *The Directiveness of Organic Activities.*
[4] *Life and Mind*, pp. 19-20.

of organised relations and behaviour, in and with reference to which goals, purposes and values emerge, have to be differentiated in the scale of organic evolution. Unlike the animal, man has memory, imagination, judgement and volition. He experiences values and fulfilments, aspirations and possibilities that no animal can.

Conscious, purposive, forward-oriented behaviour and valuation go together in man as contrasted with animal. Both rest on cognition and the use of symbols or language and learning at the human psychological level. The lower animals, governed by a set of stereotyped instincts, adapt themselves to the environment through the selection and rejection of stimuli by trial and error. No sign nor symbol can aid them in this process. First, the environmental stimuli to which they respond are largely restricted to touch, sound, odour, vision, temperature and atmospheric pressure. The organic responses are also largely random, unconscious and conditioned. In the higher and brainy animals, such as mammals and birds, such selection or rejection is aided by signs systematised and integrated into gestures and cries. The latter can and does indicate to the animal in some measure the nature of a stimulus even though it remains outside the ambit of its sensory manipulation or control. Thus it stands for a distant forward-oriented goal. In man, due to the remarkable development of individual intelligence, memory and imagination, the elaboration of learning and the accumulation and transmission of the social heritage of symbols, language and traditions, the goals are transformed into meanings, purposes and values. These are stored, communicated and transmitted and introduce both a new kind of organic freedom and environmental control—a new dimension of evolution governed by the communication system or cognition by the use of symbols and directed by values. Conscious purpose, value and striving change the entire pattern of human behaviour and evolution. The adaptation and behaviour of man transcend the existential goals and situations. He strives after inaccessible values, and thereby measures and matures his capacities and possibilities indefinitely. If he has unrealised possibilities he suffers from a chronic tension and unrest or even becomes aggressive and destructive. Not merely does he judge his own capacities and potentialities, but he also evaluates the environment, actual and potential. He even conceives the environment or the world at large as superior to what actually exists and is given for him, and designs and reshapes it according to his purpose. At the level of psycho-social evolution, the dynamic homeostasis between man and the environment *via* society and culture keeps his goals, purposes and values ever-changing. Man opens himself to the society and the universe more and more. His homeostasis ever extends and becomes cosmic in its scope and unlimited in its subtlety and delicacy of operation, ever establishing a new dynamic wholeness, stability and balance in the inner and outer worlds.

CHAPTER IV

HUMAN ECOLOGY AND EVOLUTION

The Interchange between Man, Occupation and Region

Man is a creature and agent in different dimensions of human adaptation and evolution. Such dimensions comprise a series of environments that may be demarcated as follows :

(*a*) The ecological environment of external nature, both inanimate and animate;

(*b*) The internal biological environment of the human mammal;

(*c*) The social environment, both external and internal, of the human person; and

(*d*) The ideal or metaphysical environment of man as part of the cosmos and reality.

Each of these environments, bio-ecological, social and ideal, conditions human evolution but with different degrees of control. In the case of the human species the dimensions are not mutually exclusive but impinge upon one another. First, human evolution may be regarded as a functional process or "transaction," in the sense of Dewey, between Man, Behaviour and Environment. This triangle corresponds to the Geddes-Thomson coordinates in biology,—Organism, Function and Environment, or Folk, Work and Place. The triangle is of course an abstract and selective relationship derived from mathematics. It is neither concrete nor substantial.[1] On the other hand, the conceptual frame-work of the triangle is appropriate for the understanding and interpretation of the complex functional processes in terms of the three-fold coordinates in mathematics.

Secondly, human evolution rises from dimension to dimension. Man has to be treated ecologically, biologically, socially and ideally, and yet in the integralness of his total adaptation, experience and values. Each realm of human adjustment determines his behaviour and evolution with varying degrees of coerciveness, and gives rise to sets of values and standards of moral behaviour that are clearly discernible and definable in their successive levels or dimensions. Such values and patterns of conduct coalesce or stand apart, are harmonised or come into conflict with one another, giving rise to many kinds of crisis in human social evolution. An exclusive natural history approach resting on ecology and biology is obviously inappropriate for the study of human evolution. The human organism and the environment both assume new characterisitics—regions, statuses,

[1] Vide Floyd Allport, *Institutional Behaviour*, p. 13.

values, symbols and culture—in the progressive dimensions of social adjustment characterised by symbolic, meaningful, purposive behaviour. *Homo symbolicus* is different from all other animals. His evolution and progress are guided not by trial and error but by his meanings, values and symbols that reshape his environment. Consequently we should develop a multi-dimensional methodology for the study of human evolution in which such disciplines as ecology, biology, anthropology, ethics, sociology and history should cooperate for the analysis of the many dimensions of man's evolution and of his behaviour and values. These are emergent and purposeful; their patterns direct the course of human adaptation and development as they manifest wider and richer wholes of communication and participation.

The above theory of dimensions somewhat resembles, but is not identical with, Nicolai Hartmann's conception of four layers which operate within man: the biological-somatic, the psychic, the subjectively mental and the objectively mental. Similarly A.L. Kroeber names four levels: body, mind, society and culture, and observes: "The laws of the lower level constitute the framework within which the phenomena of the higher level develop. But they do not *per se* produce these phenomena." The categories of the "objective mind" of Hartmann and "culture" of Kroeber comprise factors and phenomena that are super-organic and super-individual. In Germany it is Hegel's concept of the "objective mind" that introduced a new content of reality, that of existence on the super-individual, historical level. It is unfortunate that the Hegelian notion of the levels of reality hardly touched the methodology of the social sciences in the Anglo-American world which nurtured and thrived on dichotomies between the physical and the organic, and the organic and the super-organic.

Man's basic ecological environment subjects him to the impact of temperature, rainfall, altitude and the web of his ecological inter-relationships with animal and insect communities in the various life-zones of human and animal distribution. Nineteenth century social science established a false dichotomy of Man and Nature. From Le Play and Patrick Geddes has come the valuable insight that the Organism, Function and Environment[1] and Man, Occupation and Region[2] cannot be treated separately. Whitehead has remarked: "It is a false dichotomy to think of nature and man. Mankind is that factor in nature which exhibits in its most intense form the plasticity of nature." It is better to speak of a triadic relationship between man, nature and behaviour. For the give-and-take between man, nature and human needs, skill and achievement is on-going and ceaseless, now in favour of man, now against him. The mutuality of adaptations between ecological environment, human skill and material culture is endless and

[1] Geddes and Thomson, *Life: Outlines of Biology.*
[2] Mukerjee, *Regional Sociology.*

shifting, giving us the picture of the total ecological situation as a dynamic Gestalt. Man's region is not the mere stimulus of human ecological responses; it is saturated with human traditions and values, suffused with meanings, myths and symbols. These latter undergo transformation although the region may be the same. Each such transformation or reshaping of the region puts fresh demands upon man in his role as the ecologic dominant, the economic user, the moral agent and aesthetic participant. Thus he himself also changes in his modes of utilization or value-seeking and achievement, in his dispositions, capacities and scales of values.

The Permanence of Ecological Values

In the course of millions of years of man's evolutionary development both in the pre-mammalian and mammalian forms, he has developed peculiar physical and mental characteristics enabling him to adjust himself successfully to different ecological conditions, varying from arctic cold to tropical heat and from high mountain to sea-level as well as a general capacity for acclimatisation and colonisation far beyond the limits of his original habitat.

As man's ancestor came down from the trees to the *terra firma*, used tools and weapons and became a hunter, striking morphological changes occurred. The most significant of these were the enlargement of the brain case and the widening of female pelvis, subsidiary to the former. The discovery of fire and cooking and of scrapers, knives and other implements used for the preparation of animal flesh for human food also led to the reduction of the size of the jaw and the prominence of the chin, favouring increased cranial cavity. The discovery of clothing similarly resulted in hairlessness with its advantages of cleanliness and relative freedom from parasitic diseases and of the supersession of grooming by reciprocal sex exploration and play with improved opportunities for sexual display and selection. Sexual selection favoured the human male with bigger and stronger physique and greater intelligence and courage, and the human female with wider pelvis and greater tenderness and gentleness of disposition. Man's competitive and combative method of obtaining his partner stimulated his large size and aggressiveness. Aggressiveness now enters into the sexuality of both the human male and female. The human size also became large in order that man could defend himself against his predaceous enemies, hunt or catch other animals which provided his food, and subdue other males and maintain his dominant status. Even before the evolution of the larger and more complex brain of *Homo sapiens*, the lesser brained *Sinanthropus* and *Pithecanthropus* achieved his body mass. In the Old Stone Age the pre-man lived in the steppe and tundra by hunting; in the Middle Stone Age he lived in the forest by hunting, food-gathering and fishing; while in the New Stone Age he became a herdsman and dairyman. The steppe, tundra, forest and desert as well as the type of labour and dietary had their effects on the build and various characters of pre-

man that were altered frequently as the ecological conditions of their life changed in different climatic belts. Such changes in the direction of selection and survival led to occasional outbursts of rapid evolution of preman and early man in adaptation to their changed ways of living. The ecological law laid down by Bergmann has been found to have larger scope of application to living men with reference to the effects of the environment on their body mass and form, physiological characteristics and behaviour, habits and capacities. Men of the deserts, like the desert animals, show a light and lean body-build adapted to swift movement. The desert Arabs are light and thin. Contrasted with them are the forest-dwellers, who show a stocky, muscular build, adapted not merely to the need of locomotion, but the exercise of the major muscles and tissues for the variegated purposes of quarrying, hunting and fighting. A cold or hot desert and forest selected the physical characteristics of the primitive hunters, especially the proportion between the body area and volume. Physical anthropologists in their laboratories have been studying inter-racial differences in skin, hair, muscle and blood due to environmental influences. The close physiological adaptations are brought to light in a remarkable manner. In Africa, Hiernaux finds thick, massively wrinkled skin among pygmies and fine-grained skin among the long-legged Watusis. The dark skin of many tropical and sub-tropical races provides protection against ultra-violet light and contributes toheat-loss efficiency. Body hair is a covering adapted to the forest habitat and is found mostly among such denizens of forest and jungle as the pygmies, Alpines, Ainus, the Australian aborigines and the natives of New Caledonia. Coon finds low capacity to become fat, associated with a rigorous environment and the conditions of malnutrition. Steatopygy, as seen in the Bushmen and the Hotentots, has a survival value in so far as it stores fat without disturbing heat loss or locomotion as among the fat-tailed sheep and camels. Desert-dwellers show a relatively high blood content in relation to body weight—an adaptation to the need of sweating. Thomson and Buxton long ago found temperature and humidity responsible for the form of the nose. Where the air is cold the nose tends to be narrow and converse. The narrowness of the Eskimo nose seems to be in close harmony with Arctic conditions. Muller refers to the narrower eyes, shorter intestines and other adjustments to Arctic and almost purely carnivorous ways of life in groups which have long complied with such conditions.[1] Coon observes : "High, narrow, prominent noses are found among both desert-dwellers and people living in moderately cold regions; in regions of extreme cold the forward position of the molars and the fat pads over them help maintain the thermal equilibrium of the organ, which in all races is also useful as a part of the

[1] Guidance in Human Evolution in Sol Tax (Ed.): *The Evolution of Man*, p. 426.

machinery of speech."[1] "It has been suggested," remark Coon and his collaborator Birdsell, "that adaptation to cold is attained by developing big chests, short extremities and small globular bodies irradiating as little heat as possible. Arctic people present the least possible skin surface to the outside world in proportion to volume and weight."

As early man settled down both climate and food had their effects on his bodily structure and appearance and capacities for behaviour including intelligence. Different diets perhaps acted on the endocrine glands, which regulate the growth of the body, while abundance or lack of vitamins also modified the features of the racial type. The Eskimo from his youth up puts a very great strain on his jaws by continually chewing skins. Thomson suggests that the peculiar form of the Eskimo skull with its penthouse top is due to the great development of the temporal muscles, which by continual use drag it into this shape. Living in a region where grains and other edibles yielding starch and sugar are not available, his intake of carbohydrates is exceedingly low. Yet he shows a good physique. He is perhaps an illustration of the environmental adaptation of metabolism at a lower level than the ordinary standard. It is also suggested that the eating of cereals in large quantities, a form of diet which necessitates a great deal of mastication, is associated with the form of face and jaw so characteristic of Eastern Asia.[2] The indirect action of labour necessary to secure food supply also helps to mould the physique of the people. The skeleton bears very delicate marks of the type of labour in which a people is engaged. Not less significant in human evolution is the web of ecological interrelationships which the primitive man established and stabilised with the complement of the harmonic aggregations of plants and animals of the ecological area in which he originally rose and throve in numbers. Most of man's cereals were originally plants of the steppe, probably growing on its edges before they were domesticated by the primitive agriculturists and spread to the great plains. The chief animals that have now become entirely domesticated were also the gregarious types, which lived in woodlands and meadows where man first emerged. It is the kind of wood-land animals available for domestication in certain ecological areas which largely governed man's early economic development and culture. The facies distinctive of the plant and animal community of a region leaves its impress upon social life and organisation by determining the nature and kind of food supply as well as the domestication of animals and the character of occupations. Ecology in its wider and more comprehensive application to human evolution gives us a facies characteristic of the economic organisation of temperate steppes with large herds of mammals, of tropical rain-forests

[1] Human Variability and Natural Selection, *The American Naturalist*, September-October, 1955.

[2] See my *Regional Sociology*, pp. 215-218, also Buxton: *Primitive Labour*, chap. XV.

with little animal life on the ground, of wet rice lands, of grass moor-lands abounding in sheep and goats, of arid deserts, of bleak tundras, of forested mountains, of arable low-lands, of fertile river-valleys and so on, determined by the cumulative effects of soil and climate which directly govern plant formations and animal communities and, through the flora and fauna, govern the nature and variety of industries and economic forms. The ecological system is a dynamic balanced whole with its integrated interrelations of man, plant and animal that develop into enduring social habits and values or culture, making for man's dominance and continuity in the ecological area. Survival, sustenance and permanence in relation to the ecological area that man (considered as population) inhabits comprise the functional pre-requisites of his ecological system. These underlie certain generic ecological values that are recognisable and enduring and that give a distinct articulation to his social adjustment. What is significant to remember is that even in a highly industrialised civilization the ecological picture and values cannot be missed. For industrial civilization finds its security now threatened due to the exhaustion of coal and petroleum and the diminishing supply of calcium, phosphorous and other minerals necessary for man's organic growth and economic stability, and of certain vitamins which he cannot manufacture synthetically, apart from the unfavourable effects of the prolonged loss of sun-shine, ultra-violet ray and green vegetation on his health and sanity. Obviously the evolutionary success in his adaptation to the geographical environment rests on certain ideal values which have their roots in ecological values, but which have reached the level of standards of moral behaviour. Yet he turns his attention to these only when he faces ecological calamity or disaster in an unbalanced or depleted environment, neglecting his constant dependence on the operation of the bio-ecological processes and events on which depend his sustenance, selection and continued survival.

Man's arts and patterns of utilisation and progress are interlaced with soil, water and climate and also with the organic setting of the harmonious vegetable and animal communities that have arrived at a more or less stable synecological equilibrium. Economic and social values subserve the more comprehensive synecological values of the interdependence and balance of life. It is these latter which govern the pattern of his basic ecologic adjustment, dictated as much by his instincts and needs as by the heritage of his land-water culture in the course of his social development. Ecology, which is the science of community populations in their interdependences, is the foundation for the formulation of a consistent view of human evolution.

The Natural History of Ecological Values

In the hunter stage, which is a stage of culture universally passed through in the wood-land, man kills whatever beasts he meets with. Slowly

he learns to discriminate between tolerant animals which he protects and intolerant animals against which he wages war. Then he finds that it is more useful to breed gregarious animals and succour their young even for the purpose of consuming their flesh. In this cattle-breeding stage, man first kills animals at all periods of their lives and also exhausts pasture lands. Gradually he develops the care, breeding and improvement of stocks fitted for particular conditions of climate and his own varied purposes. Both Hahn and Laufer stress that economic and magico-religious factors were equally connected with incipient domestication of animals in the early history of culture.

The pastoral industry, when it is extensive, involves destructive exploitation of the natural vegetation and may be described as robber economy. It is short-lived, for it destroys the ecologic balance on which it depends. In the light of this there is no need of postulating climatic cycles to account for early migrations of pastoral people which might have begun in seasons of drought, but droughts were not the sole cause. The causes of early migrations should be sought rather in the cumulative effects of mismanagement of grazing lands, and progressive decrease in rainfall due to de-forestation. As man's forest and grass-burning reduced and destroyed forests, and as his overstocking of cattle, and especially sheep and goats, led to the impoverishment of pastures, he migrated to fresh woods and pastures.

Toynbee in his enquiry into the life of Nomadic Civilization observes that it looks as though the phenomenon of occasional nomad eruptions out of the Desert into the Sown has a rhythm of its own which is as regular, on its own scale, as the nomad's regular cyclic annual movement, south to north in spring and north to south in autumn in search of pasture. While the movement in search of pasture has a year period, the eruptive movement resulting from widespread ecologic unbalance and calamity appears to have a six-hundred-year period.

Gradually the seasonal movements of hunting and pastoral groups from the interior to the open plains and back again are superseded by permanent migrations to grass-lands and thence to river plains and deltaic areas where relatively fixed habitations arise. The productivity of the well-watered valley and plain and facilities of irrigation and transport, which promoted continuous contacts between peoples of the upper and lower reaches of the river, produced "ribbon development" that characterised ancient riverain settlements. Early in his development man's conflict with the wild beasts of prey, which his descent from his arboreal habitat involved, led to the discovery of tools of stone, bone or wood which were superseded by those of copper and bronze about 3000 B.C. As he multiplied in numbers on the grass-lands and as the forests decreased, there were conflicts between the shepherds and hunters. Such conflicts made man rapidly more and more gregarious; these contributed towards consolidating

families, and hordes into tribes and established patriarchal authority in the tribe of kindred, as distinguished from the mere patriarchal family. The integrated and more numerous tribe could appropriate larger and better territories and defend these against any smaller groups of competitors. This held good more for pastoral than for hunting communities, and more for farming than for pastoral communities, the succession of types of land exploitation bearing a direct relation to the density of population. The discovery of agriculture and the domestication of animals in the Neolithic Age marked the transformation of the simple economy of clan, tribe and territory into the complex economy of a larger aggregation. Such economy could only be maintained on the basis of a new understanding of ecological inter-relationships of man, animal, plant and insect that are woven into cultural needs and values. Ecological and cultural adaptations are enmeshed enabling man to multiply his numbers so that hamlets, villages and towns could rise as dynamic patterns of adjustment of large populations to the resources of the region.

Relations of Magic and Religion to Ecology.

Not merely social organization and traditions but also religious customs and beliefs, focussing and idealising ecological values, came to be implicated in the economic development of the Neolithic man. In the forest environment of early man, totemism and the cult of animal guardian spirits are the earliest spiritual expressions of man's ecological alliance with plants and animals that surrounded him and captured his imagination by their economic rewards, by their strength, cunning or any other unique trait. Thus these came to designate human relationships or served as guardians among the casual feeders and hunters in forest and bush-land. Totemism has different roots in different primitive settings, but there is no doubt that the partial or full interdiction against the consumptions of certain totemic animals and plants that are considered sacred may have its genesis in the ecological necessity of assuming the supply of scarce resources for a primitive tribe. Durkheim mentions that old men were freed from the restrictions under which ordinary men were placed and also that elsewhere only a little consumption was permitted. To go beyond that amount was a ritual fault that had grave consequences including death. Spencer and Gillen held that these restrictions were not the remnants of what was once a rigorous prohibition now losing hold, but the beginnings of an interdiction which was only commencing to establish itself.[1] Totemic and religious purposes have also aided the domestication of animals. In South-eastern Asia the pig and the chicken have totemic significance, while the humped bull seemed to have been associated with religious motives in the Indus Valley Civilization as the horse, whose appearance in India was associated with the advent of the Rig-vedic Aryans, had great significance

[1] *The Elementary Forms of Religious Life*, pp. 129-130.

as the sacrificial animal for their kings and warriors.[1] The value and entire development of magic are rooted in man's desire for mastery over the ecological environment. He practised rainfall and sun-rise magic, and the rain fell and the sun rose. In his myths and legends he ascribed the power of flight to his heroes and gods. In his animal dances he imitated the chase and hunting of the fearful beasts and pronounced spells and invocations, gathering courage in his hazardous adventures. He drew the various beasts on a cave wall and made clay models of them for their destruction by magic. All states of tension—fear, anger, love and greed—are dealt with by magic which not only safeguards the emotional stability of the individual but also dramatically resolves the ecologic crisis of the community. Malinowski stresses that primitive religion subserves the most valuable function of releasing emotional and economic stresses and strains connected with the hazards of gardening and fishing. But primitive religion is concerned with every phase of mental life and is not merely cathartic in its aim. Wishing to conquer death, man elaborates mortuary rites, preserving the corpse and muttering spells to revive it. Or he places charmed objects in the tomb assuring a special life for the dead. Again, his religion promises immortality so that he can rise up to heaven in a chariot and enjoy all the pleasures of life there. Health and longevity, wealth and power, love and fellowship all come under the domain of magic. For man wants to believe what he wishes or fears most. It is the acts of magic which fulfil the wish and dispel the fear through supernatural power which super-imposes its quality upon the acts, there being no division between natural and supernatural in savage mind. The interpenetration of ecologic and supernatural realms is the inevitable device of primitive man to control perplexing and unpredictable ecologic forces and realities. All magic, myth and religion of primitive peoples are dramatised resolutions of ecologic tensions, and achieve individual integration and ecologic survival.

The ecologic anxieties and fears of shepherd and pastoral folks are far different from those of hunters and food-gatherers. Magic among the Todas is entirely connected with the rearing and milking of buffaloes. A different kind of magic and religion originates in the course of long marches by day and vigils by night when organised shepherds seek new pasture lands. Organised pastoralism furnishes early man with the ecologic beliefs and values concerning the procession of nature, the sequence of the seasons and the rhythm and order of vegetation. For the ecologic tensions and crises of pastoral existence are ever-recurrent, and depend for their resolution on the herds and men following nature's cycles and sequences. Out of the ecologic continuity of flocks and herds through the generations also arise new beliefs and values of immortality. The autho-

[1] Mukerjee: *The Political Economy of Population*, p. 67.

ritarian head of the shepherd-households creates God's image as the Beneficent Patriarch. The hazardous route of migration through grass-lands and deserts is invested with moral and spiritual meanings. The Way becomes the Path of Salvation. Such a tradition is still strong among many peoples of Aryan descent.

The Ecological Beliefs and Values of the Agricultural Communities

Early man in certain regions derived more ecologic elements and values of his culture from the deciduous forest and bush-lands than from the grass-lands, and passed from the hunting phase to some kind of intermittent agriculture in the scattered settlements of the open plains by skipping over pastoralism. But agriculture could not develop beyond hoe-cultivation before man had learnt the protection, nurture and intelligent use of horses and cattle as co-dominants of the grass-lands. Cultivation and irrigation probably originated and evolved in the margins of wood-land, skirted by the river rather than in the wood-land itself. But permanent cultivation could not be introduced before magic and ceremonial practice associated sowing with the killing of animal or man or with the sexual orgy. The tentative experiments in agriculture are in most countries of the world still dominated by a priesthood devoted, first, to animal sacrificial offerings, and, then, to the observance of a large variety of seasonal fasts and festivities that allay suspense and anxiety immediately before sowing, and elicit strenuous toil during weeding and ploughing operations. If the hunters and savages have their dance festivals, ball games and surf riding, the agricultural folks have their hilarious harvesting festivals which celebrate thanks-giving to nature for the fruition of the toil and moil from seed time to harvest.

The ecologic values of the vast complex of magic, religion and ceremonial practice are closely woven into the warp and woof of his early biological community system with his domesticated plants and animals, such as cereals and draft beasts, and his allies,parasites and scavengers, such as legumes, weeds, rats, dogs and pigs. All are enmeshed in an ecological interchange that man maintains and develops for his own survival and progress. Sometimes there is protection and care of animals and birds such as deer, monkeys and parrots that live in herds and flocks and trespass on and deplete human food supplies. Man in many regions finds himself more at home in the deciduous forest from which he has originated than in the open plain or prairie whose rigours and distances he cannot withstand. Further, as he has brought to the open plain his habit of indiscriminate extermination of wild animals, he has caused the grain and forage-eating rodent populations to multiply to an extent which jeopardises farming and animal raising. Feudalism and the combination of privileges in land-holding with military responsibilities, which serve as the foundation of the authoritative type of state and the class system, represent, however,

original and essential ecologic acquisitions in the deciduous forest environment. These have left an indelible impress on the social development of peoples who sprang from the forests and steppes of Europe and Central Asia. Ecologically speaking, feudalism, as seen in the manorial system, represents an ecologic adjustment bringing about both stability of the rural population and increasing returns from the land. Sociologically speaking, the power and prestige scheme and stress of obedience and protectiveness, loyalty and authoritarianism, associated with feudalism, are distinctive of this higher ecologic phase. By giving protection to groups of cultivators as serfs, vassals or tenants in the forest or virgin prairie, it contributes to replace intermittent cultivation by intensive agriculture, and encourages both increase of population and a higher level of living and standard of moral behaviour within the framework of a social hierarchy. The contrasts of ecologic habitat, forests, grass-lands and open plains even now decide many of man's distinctive preferences and cultural traits rooted in his ecological balance and solidarity.

A denser growth of population quickens the march of peoples, and they extend further and faster from the forests through grass-lands to the open plains and marshes down the course of the river and its tributaries. The village community now originates as a universal ecologic pattern in the spacious river valley, subjected to population pressure, for regulating the streams and distributing their water for irrigation serving the holdings that are scattered in different blocks of the agricultural settlement. It controls both arable lands and pastures as well as sources of irrigation. It equalises the opportunities of agriculture for all, prevents the rise of a class of have-nots, and enforces a routine of farming which looks to the interests of the later generations. From this economic management also develop the Council of the Five, and the rudiments of village and communal government. Such institutions are ubiquitous, and even now preserve their greatest strength and vitality in vast open river valleys which have witnessed the gradual expansion of agricultural tribes. The stabilised, cultivating ecologic animal, as he first leads an organised social life and multiplies in numbers, prepares for the future and has a plan. His magic, religion and moral beliefs become different. To obtain rainfall he sprinkles water on the dry and parched cultivated field or ascends the hill top, sacrifices an animal and flings rocks and boulders down the hill slope so that rain may follow the continuous rumbling roar like that of thunder. Or he lights fire so that rain may come out of the cloud of smoke rising to the sky. In the tropical orchards of the Pacific the garden magician with his proper rituals on selected plots imposes upon gardening a time-table and organisation which the climate does not do. Again, the priest offers prayer to the mother deity vigorously sculptured with a rhythmic arrangement of curves and volumes that underlines her fecundity and opulence so that she may bestow a rich harvest. The gods of the sky, wind, and cloud, and of the

dawn, sun and moon also now enter into man's religious consciousness. He invokes even the Earth Spirits for bestowing fertility to his fields and protection against his diseases and those of his domesticated stock. Moon worship and astrology originate for forecasting the periodical inundations of the rivers and the seasons of sowing and harvesting. Thus does early man seek alliance with a much wider range of ecologic forces which surround him and influence and overreach his life. It is the priesthood which forms the link between farming culture and the unseen ecologic forces and realities. They ensure the early farmer knowledge of the sowing and reaping seasons, linked with a crude astronomy they cultivate, and recovery from drought and disease, which are mixed up with their magic, taboo and ritual. Early man's change from casual subsistence to sure and cooperative living in the agricultural community is facilitated by the temple and the priest, and by worship and sacrifice.

The Ecology of Houses and Habitations

Man's pattern of habitations in relation to the ecological area, region and cosmos shows distinct stages in the course of his social development. The first stage is represented by the primitive community's tentative, haphazard and careless transformation of the features of landscape. On the sunny or wind-protected sides of a hill or mountain, in the meadows or clearings of a thick jungle, on the fertile alluvial plains intersected by a big river, and on the ridges of marshy low-lands, we find scattered hamlets of primitive folks and regular compact villages of civilized communities cropping up. Their form and pattern are entirely governed by the conditions of soil, topography, water-supply and agriculture. As long as man's reactions to the Mother Earth—the idealisation of invisible and unpredictable ecologic forces met with in all early cultures—are governed by fear and anxiety, it is these bewildering ecologic forces that are writ large on the patterns of human habitation, whether the Kraal of the Zulus and Bantus, the Igloo of the Eskimos and the pile-dwelling of the South-sea Islanders.

The second stage in the development of man's ecological relationship is represented by rational and systematic adjustment of the environment to his differentiated needs for protection, food, shelter and worship. The villages of all civilized communities everywhere show a pre-meditated plan and pattern, a geometrical transformation of the landscape characterised by the formation of cultivated fields and houses into a systematic unity. Indian, Chinese, Greek, Roman and mediaeval European villages all show a clear and well-defined lay-out, a systematic pattern of the streets and introvert arrangement of the houses built around inner courtyards. Often walls are constructed cutting off the habitation from the surrounding countryside—symbols of self-competence, self-sufficiency and solidarity of the community. The lay-out of human habitations in this phase of social development has a religious and even metaphysical significance embodying the

reciprocal relationship of the microcosm and macrocosm in the living orientations of space and time.

The third stage of the spiritual interchange between man and cosmos is foreshadowed by modern applied ecology which looks forwards to man's future advance through a bio-ecologic cooperation, based on the scientific comprehension of the complex web of Life that comprises both the living and the non-living realms, and this is deeper than, and goes beyond, co-operation merely within the human community.

Such a conception is historically embodied in the pattern of construction of villages, towns and temples in India that are built according to a plan in which the habitations and temples are replicas of the macrocosm, and man in his circumambulation of the village, town or temple follows the course of the stars in the firmament. The metaphysical idea of the unity of the universe governed the plan of city and temple building in India, Tibet, Burma, Siam, Cambodia and Indonesia. The city in its entirety and the temple in its regular hierarchy in its galleries or terraces is a monumental embodiment of the universe-structure. The city is the temple and the temple is the city in India. The plan of the temple is reproduced in the city and *vice versa*. Man's architectural and engineering arts here deliberately produce the illusion of cosmic expanse. The architectural composition of towers in the temple that rise by the side of towers, gradually increasing in height or dimension leads the mind to the wholeness and emptiness of sky—a solid vault which covers the Indian legendary world-mountain Meru that supports the sky or Mount Mandara that is used as a stick by the gods for the Churning of the Ocean. A metaphysical unity in diversity of levels or grades defined the objectives of city and temple planning that gained in social awareness, foresight and coordination across the centuries.

The expansive ruthlessness of the Industrial Revolution with its unparalleled, one-sided exploitation of resources and ecologic unbalance has reached its apogee in contemporary architecture in the sky-scraper that at once embodies and creates intensity, disharmony and confusion. The symmetry and grim exactness of the sky-scraper echo the injustice, irrationality and chaos of the industrial structure, soil exhaustion, rural decay and metropolitan concentration that have held the masses in their grip with the underlying canker of insecurity, unemployment and maladjustment. The modern sky-scraper, whether in Europe, America, India or China, is built entirely out of the common man's economic reach and moral stature. It also involves stupendous and profound change in man's use of resources through a primarily quantitative expansion. It lays upon man at its base an inhuman driving pressure and urgency that all the more signalise the frustration of his goal and satisfaction. Like the Egyptian pyramid of old, the sky-scraper overwhelms, demoralises and conquers his personality by engendering fear and awe through exploiting the economic and political

power implicit in the social organisation and producing an unexampled ecologic maladjustment of man and resources.

The Ecological Unbalance on a Global Scale

Two major processes have been operative since the middle of the nineteenth century in bringing about ecological unbalance, unsettlement and calamity on a global scale. Since the Industrial and Commercial Revolution in Europe and the European scramble for territories, raw materials and minerals in the various continents, the world has been witnessing an unprecedented exhaustion of natural resources and destructive erosion of soils. These are now proceeding in such an accelerated tempo after the two world wars as to seriously threaten the standard of living of the future generations of mankind. Industrialization has spread throughout the world and is linked up with commercial agriculture that has expanded everywhere, leading to increasing depletion of the world's soils, grasses and trees. The increase of world population which has been also phenomenal in this epoch has also aggravated this quick one-sided exploitation of nature and loss of ecologic balance, aided by modern agricultural engineering and technology. Many undeveloped countries in different continents have come under the ambit of world science, technology and industrialization. These had evolved habits and customs with reference to sex, marriage and reproduction that established some kind of a balance between birth-rate and mortality. The spread of modern medicine, control of diseases and public health measures have reduced their death-rates so markedly that ancient customs connected with marriage and reproduction have now become serious misfits. Both the artificially bolstered-up industrial standard of living and man's indiscriminate multiplication have been destroying the wise and durable patterns of farming of old civilizations and the synecological values associated with it. Modern industrialism with its myths of more consumption and more production have shown a characteristic insensitiveness to ancient agricultural ways and values. As this spreads throughout the world it transforms traditional forms of land utilization based on foresight and moderation, pinning its faith in an infinite capacity both to produce and to consume that is regarded as the sole remedy of an accelerated tempo of population growth, heedless of the depletion of nature's resources.

Each region of the world embodies a specific pattern of maintenance of its edaphic, hydrographical and vegetative cycle for its stability and a separate pattern of technical and social measure for the basic improvement of the living standard of man. Everywhere on the face of the globe the Industrial and Technological Revolution proceeding on a world scale is leading to a wanton destruction of resources. Everywhere, and especially in ancient countries having large sedentary populations, the roots of the region's life are being sapped, destroying the balance and rhythm of nature which alone can safeguard the stability of human culture. To the ancient

recurring catastrophes of famine and pestilence is now added a state of chronic famine of wood, coal and oil without any remedy or substitution. The Western mission of developing the under-developed economies of the world through the introduction of tractors and fertilizers upsets the wise native system of crop rotation. Horticulture through the use of the spade and hoe and the succession of legumes with cereals that kept alive the soil fertility at a stable, though moderate, level in India and China are superseded by the application of modern technology that sacrifices future prosperity for quick and immediate gain. Engineering devices, dam construction, flood control and river management in the areas of the Niger in West Africa, the Sutlej and the Indus in the Punjab, the Damodar in Bengal are not enough to prevent the recurring ecological calamity that had led to the ruin of many ancient cultures such as Harappa, Mesopotamia, Kapilavastu, Palestine, Angkor and Gaur. There is great risk that India's vast multiple river valley schemes may be jeopardised without afforestation and adoption of conservative methods of agriculture and grazing by small forest users, farmers and graziers in the upper catchment areas of the river valleys.

Technology is futile unless it is strengthened by a change in the system of land tenure, in the practice of bunding, terracing and conservative agriculture and in the programme of rural democracy working out a new balance of soil, water and farming, area by area. Hydraulic engineering projects are bound to fail if these are not integrated with ecological programmes of water-shed management. On the whole, the conservation practices that are recently introduced are of the nature of mitigating "biotic" injuries and sufferings. The art of producing land health, wholesomeness and vigour through a system of ecological knowledge and foresight has not yet emerged. The world needs a new ethic and aesthetic under which man may transform the ecological creed of science into a normal and religious obligation to the future generations. Without the virtues of thrift, humility and foresight mankind cannot bequeath a good earth for future prosperity nor discipline the modern industrial mood engaged in artless destruction on a global scale.

The Ecological Unity of the Earth

Applied ecology can show the way towards inter-regional cooperation and the solution of many inter-racial conflicts. Through the processes of competition, specialisation and migration, the entire earth has been divided into economic regions, such as pioneer zones of forestry, mining and plantation, agricultural zones and zones of manufactures. Each zone of settlement presents its characteristic population distribution, its distinct pattern of social composition, stratification and constitution. As in the plant world, the fringes of the different vegetation regions are ever being invaded by the surrounding vegetation, similarly the seeds of dominant civilization move out to neighbouring regions and germinate. From the

centres and foci of the old agricultural settlements peasant colonies spread out to the grass-lands, sand-dunes and forests from the manufacturing zones, pioneer entrepreneurs, financiers and traders move out to mining and plantation zones for supplying their homelands with raw materials. Between the homeland and the new frontier of civilization, there is a give-and-take of the human material as well, the homeland being used both as a reservoir for fresh supply of migrants and a refuge for those who fail in struggle and adaptation. The struggle and adaptation in the frontier zones are both climatic and social. The capacity for quick change of position in the social hierarchy and the occupational pattern and the capacity for quick acclimatisation mark out the successful migrant in the pioneer belts of settlement.

In the early stages of settlement, the pioneer invading stocks persist in a one-sided exploitation of the backward group or region, and maintain superior political power and prestige as well as economic and social status, which cannot easily be challenged by the education, efficiency or ambitions of the backward groups. The social structure shows an unbalance like a pyramid standing on its apex where the dominating ethnic groups, numerically the fewest, are concentrated. In the intermediate stage the social structure of the settlement is characterised by territorial, social and occupational segregation of the different ethnic groups, gradual levelling up of culture and efficiency and a constant upward pressure from the base of the occupation pyramid to the apex. In the last stage, the division of labour and social control patterns are governed entirely by the needs of conservation and development of the resources and inhabitants of the region; and ethnic groups and individuals keep changing positions and occupations until the different parts of the social structure approximate a symbiotic relationship maintained on the basis of the integrity and uplift of the ecologic order itself. Political power and economic prestige are shared by the superior and inferior groups; cultural distance is bridged; and the transition from a pioneer and backward zone of settlement to a mature zone with its modern technical and cultural equipment, distinctive of change of the ecological base, is accompanied by an occupational and spatial redistribution and a new occupational balance, which conserves the resources of the region.

The trend of inter-zonal ecologic cooperation on the earth is from a relationship based on a one-sided parasitism arising out of difference in levels of equipment and culture to one based on territorial division of labour in a uniform level of efficiency. World ecology lays bare the danger-spots in human demographic distribution and exploitation of the earth, and in each new economic zone or frontier belt of civilization points the way towards the establishment of the balance of population, occupation and culture, based on a symbiosis between the more efficient and immigrant and the backward resident groups, and the conservation and development of regional resources from the standpoint of its original or permanent resi-

dents rather than from that of the intrusive and immigrant non-residents. The physiological equipment, dietetic standard and incapacity for manual toil of the latter often make them less fitted, like exotic plants and animals inappropriate for ecologic aims, to profit best from the inheritance of the region. The present mal-distribution of world population and resources; the accompanying unbalance of agriculture, manufacturing and extractive industries; the social mal-adjustment and chaos characterised by the disparity of social status, prestige and power; and the exploitation of underdeveloped regions by dominant cultural groups, all these are the root-causes of world poverty in the midst of plentitude of resources. In no epoch in the history of human space distribution and exploitation of the earth, have an ecological goal and programme been in more urgent and widespread demand than in the modern age with its economic nationalism splitting up the ecological unity of the earth, and its economic imperialism disintegrating the accumulated force of region and tradition.

CHAPTER V

BEYOND THE PRIMATE : GRASS, TOOL AND HUMAN NATURE

Homeostasis and Evolution of the Human Mammal

Man as a mammal lives and thrives both in his external geographical environment and also in his internal biological environment. Or better, the human mammal's biological functions are divided between his external and internal environments. His internal environment comprises his system of blood circulation, secretion and lymph and the ramifying nervous organization. In his case both the external and internal environments smoothly act and react upon each other, maintaining his bodily and mental health, and regulating all his transactions with both the physical and the social environment. His biological adaptation to the natural environment, with which there goes on a constant interchange of materials and energy, is in fact mediated both by his overt responses and internal adjustments—the self-control and regulation of water, sugar, salts and temperature, among other adjustments. His living parts are bathed by the circulating fluids, especially the blood stream. He does not exist in the atmosphere which surrounds him but is separated from the latter by a layer of inert material. He exists in a fluid matrix which provides him with his private internal environment. Just in so far as this internal environment or fluid matrix is kept from noteworthy variations, caused by climate, food supply and excessive toil, there are no internal adjustments to be made; the internal organs can perform their functions undisturbed by the ups and downs of external circumstance or by the possible consequences of his own strenuous activity. The nearly thermostable state, the constancy of the mild alkalinity of the blood and its sugar concentration are examples of this stability. The above brief analysis is derived from the distinguished work of Walter Cannon who gives this constancy, so peculiar to the regulatory processes, a special name, "homeostasis." Homeostasis with a tendency towards dynamic equilibrium and periodicity of physiological activity is the regulation, control and maintenance of conditions for man's optimal existence.[1] The great physiological advantage of homeostasis is that it releases for the exercise of their peculiar services the higher functions of the brain. Man's mental evolution would not have been possible if the functions of his vertebrate body during millennia of evolution were not automatically controlled and liberated from disturbing or limiting external conditions.

A special portion of the nervous system has become established in man that coordinates in an automatic manner the regulatory arrangement for

[1] Walter Cannon : *The Wisdom of the Body.*

preserving steady states in the body, notwithstanding conditions that may hamper or be destructive. His physiological stability and freedom of action are linked with each other so that there is relatively a smooth and easy adaptation to his complex external environment. Further, the structure of the human brain and the nervous organization are differentiated towards larger creative and social use of energy and material, towards more subtle and enduring response to fellow-man grounded in his physiological liberation from external restraints and pressures. His sociality is also very largely based on the delicate and fine adjustment of the brain and the nervous system with their associated freedom and environmental control. The development of the frontal lobes of the brain in particular favour control over the instinctive life, reciprocal behaviour, cooperation and learning. Washburn observes: "Our brains are not just enlarged, but the increase in size is directly related to tool-use and speech, and to increased memory and planning. The general pattern of the human brain is very similar to that of ape or monkey. Its uniqueness lies in its larger size and in the particular areas which are enlarged."[1] According to Rensch, the capacity for learning is proportionate to the fore-brain enlargement. On the other hand, social cooperation heightens the efficiency of the brain and the sympathetic nervous system and renders more certain the selection for survival of socially advantageous brain qualities. The use of force or cunning in dealings within society, as in theft, robbery or exploitation or between peoples and nations as in war, cold or hot, expropriation and genocide, is inimical to the evolution of mental life, and therefore upsets the age-long evolutionary process which has selected man for the highest social destiny.

The Human Mammal's Brain and Hand—Major Instruments of Evolution

Ever since man's fore-runner differentiated himself from the anthropoid stock, and made his fateful descent from the trees to the *terra firma*, not only intelligence, cleverness and insight but also gentleness, kindliness and sociability were imposed upon him.[2] All the terrestrial creature's bodily and physiological features were making him more and more social and moral. The hominid's bodily development in the terrestrial habitat assured his further advance as it moulded a human nature, its "humanness" differentiating itself from the nature of all other animals.

Already the human mammal's bodily modifications during his arboreal apprenticeship enabled him to carry a brain that became the prime instrument of selection, survival and progress. Among the ape-men the hands, completely freed from locomotion, became the flexible, adaptive instruments of the mind feeling their way through life's new tasks and adventures in the

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[1] Speculations on the Interrelations of the History of Tools and Biological Evolution in Spuhler (Ed.): *The Evolution of Man's Capacity for Culture*, pp. 27-29.

[2] Compare Montagu: *The Direction of Human Development* and Julian Huxley: *Man in the Modern World* and *The Uniqueness of Man*.

terrestrial environment. Man's plastic, generalized, manipulative hand is the anatomical mould and model of all major tools, weapons and machines discovered by him. G. Révész observes: "The clenched fist represents the hammer, the grasping hand one-half of a pair of tongs, the curved hand the spoon and the spade, the hand with fingers spread out the fork and the rake, and lastly the thumb and index finger in opposition to each other represent the fixed and valuable instruments for gauging. Even the most complicated machines imitate the position and movement of hands and fingers." Tools, weapons and machines are the unprecedented biological extensions of the fateful human handedness enjoined in man's manipulative, controlling functions with his big brain and stereoscopic eyes. The big and fine brain was well adapted for inquisitiveness and productiveness as well as for the control and manipulation of the hands wielding a variety of tools for delicate and complex adjustments. Stereoscopic colour-vision also aided a precise and meaningful picture of objects and events. The closeness of the human brain-hand-eye nexus is abundantly demonstrated by modern neurology.[1] Without a proper appreciation of the biology of tools, the tool-making and tool-changing animal's control over the external world and the transformation of his body and mind in the process cannot be understood.

Interacting Factors in the Size and Growth of Brain

The extraordinary development and transmission of man's extra-corporeal tools largely dispensed with bodily adaptations to the environment in his evolutionary scheme. As artificial tools and weapons were used, the need for natural tools and weapons for offence and defence—the teeth, and especially the great eye-teeth, and the finger-nails of the primates dwindled. As a consequence the upper jaw shrank, enabling man to produce effective speech, and the muzzle was also converted into a face leaving ample room needed for cranial cavity. Some physical anthropologists consider that Java man with his huge jaws, heavy with large teeth, was not a speaking animal. His brain size is intermediate between that of ape and man. The brain, skull and chin all grew longer and the eyes were projected forward in emerging man and his face was fashioned by the new way of life in the terrestrial habitat. It took a long time for the human countenance to develop its characteristic features. That evolution began with man's arboreal ancestors among whom vision was at a premium and the eyes underwent a big improvement. Both the development of the eyes and facial muscles stimulated social communication and intercourse. The expression of such basic emotions as love, anger, fear, pleasure and pain by slight facial modifications proved in particular invaluable for the development of a complex variety of social relations and behaviour. Above

[1] *The Evolution of Human Nature*, p. 386.

all, the reduction of the size and heaviness of the jaws permitted the characteristic enlargement of the human brain size. As man used and manipulated tools and words, his brain also grew. According to the wellknown neurologist Herrick, "the human brain is the most complicated structural apparatus known to science. If all the equipment of the telegraph, telephone and radio of the North American continent could be squeezed into a half-gallon cup, it would be less intricate than the three pounds (1400 cubic centimetres capacity) of brain that fill your skull and mine. More than half of this brain tissue is cerebral cortex and parts immediately dependent upon it. The most ungifted normal man has twice as much of this tissue as the most highly educated chimpanzee." The larger and heavier the brain, the greater the intellectual activity and voluntary control of behaviour. This is a broad generalisation. For the weight or size of the brain is only a rough indication of mental activity. Scientists mention that Anatole France had a brain of only 1100 cubic centimetres i.e. half a pound below average. It is noteworthy that the brain of a human idiot is of the same size as that of the chimpanzee and of the early fossil man-apes. Herrick points out that the enlargement of the primate cortex was rapidly accelerated at the transition from ape to man, and this acceleration did not precede but followed the bodily changes associated with the erect posture, and the shift from arboreal to terrestrial environment. The cortical differential of man followed changes in the skeletal and muscular systems in adaptation to the changed patterns of behaviour in his terrestrial habitat. "The ape became a biped before he became a man."

Man's upright position is as basic and original as any fundamental instinct. The straight and supple pillar of the human body, the spinal chord, enables it to carry a weighty brain-case easily at both rest and movement. The erect posture, the pair of sprinting feet with their supporting heels, the broad pelvic bones and the swelling buttocks, thighs and calves differentiate humans from other creatures and are all the outcome of his desperate need to run for sheer survival. These progressively developed on the grass-lands. Like his quick movement, his needs of vision, alertness efficient discrimination and quick thought were also far greater due to the reduction of security which the loss of his climbing powers implies. The evolution of his preferred erect posture in gait had, according to George S. Klein, enormous consequences for his perceptual potentialities and discriminative capacity in relation to objects around him. He observes: "It may well be that spatial perception depends much more on the vertical orientation than is appreciated. In making possible new discriminative sets it perhaps also made possible man's developing many more intentions and claims upon objects than he could have without it."[1] Active and effective discrimination of friends or enemies and favourable or dangerous

[1] Perceptions, Motives and Personality in McCary (Ed.): *Psychology of Personality*.

elements in the environment enabled the ape-man to come more to the open grassland with wide horizons and facilitated his shift from foraging to hunting which was crucial in man's emergence. Sewall Wright has recently shown that man's ways of living not only gave him an erect posture, emancipated his hands and altered his physique in many other ways but also changed the matings and therefore the evolutionary process.[1]

Interacting Factors in the Individualization of Man

Biologists and physical anthropologists show considerable differences of opinion as to how, why and when certain subhuman creatures were modified in their bodily and mental traits until they assumed their characteristic human pattern. They are apt to stress the role of one single factor or set of factors and overlook the congruence of influences and changes at different levels that fashion a human structure and nature. There is no single or simple key to the complex phenomenon—the emergence of Man and of a Human Nature. There "converged" the influences of complex factors at different dimensions, anatomical and physiological, ecological and economic, psychological and sociological and demographic. Of these, the outstanding ones which may be selected as responsible for the differentiation of human from anthropoid structure and nature are :

1. Anatomical and physiological : man's erect posture, emancipation of hands from the function of locomotion, movement with the aid of legs and feet, and increase in the quantity and complexity of the brain and nervous system, favouring cortical control of sex and other emotions and invention of tools and speech.

2. Ecological and economic : his adoption of the hunting way as adaptation to the grass-lands with abundant game, use of tools and implements, division of labour, economic cooperation and migration.

3. Psychological : his enduring sexuality and association of sexes, prolonged dependency of offspring, parental tenderness, and general sociability and educability.

4. Sociological : his monogamous mating and stable family, large compact and heterogenous community, use of words and other symbolic devices and permanent social heritage.

5. Demographic : his moderate density of population due to the aggregation of families into large communities which establishes the genotype through a quick selection of physical and mental traits of selective advantage, and accelerates evolution in adaptation to the changed habitat, needs and ways of living.

All the above factors and influences were interdependent and congruent occurring in the fateful process of transformation of primate into human

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[1] Quoted by Gardner Murphy in Psychology and the Knowledge of Man in Leary (Ed.): *The Unity of Knowledge*, p. 106.

ecology. But the central factor and influence was, of course, the remarkable growth of the brain and nervous system.

Man's brain is not a mere thinking organ. It also controls and co-ordinates the movements and activities of the hands and other organs of the body. J.B.S. Haldane considers that between the two super-animal activities of the human brain, manual skill and logical thought, the former is the earlier acquisition of the two and the capacity of language and thought has grown up around it.[1] Washburn also says that it is possible that tool-using may require much less brain than does speech and might have started as soon as the hands were freed from locomotor functions. "Oral traditions, essential for complicated human society," according to him, "were not possible with less than 700 to 800 c.c. of brain, and there is no likelihood that elaborate traditions of tool-making are possible at lesser capacities, although simple pebble tools might well be."[2] Man's learning and capacity in the grassy open country to use at least simple tools and implements were prior to his use of words, signs and symbols. It was the tool-using and tool-changing tradition which was the first to develop and be transmitted among his social heritage. Wits and grass lands encouraged omnivorous and hunting habits. Combat against the big carnivores that surrounded the incipient humans necessitated quick physical movement as well as mental alertness, strategy and foresight. This favoured the invention of both tools and speech.

All ape-men had to become tool-users because their finger-nails and teeth were such as could not tear the hides and skins of animals they hunted for food in the open territory. Gradually tools of increasing variety and complexity were discovered. On the one hand, speech enlarged the brain and mental possibilities and stimulated the invention of tools. On the other hand, an elaborate tradition of tools of complex range and variety was correlated with human speech. Both tools and speech made human hunting on a large scale possible.

Hunting and Human Evolution

The hunting mode of life in the grass lands with a variegated supply of small and large grazing mammals as game resulted in a larger community through a more abundant food supply, and fostered an intimate and intelligent interplay of communication and cooperation, correlated with an increase of population. Speech grew into language in an atmosphere of consensus and accord between the leaders and the led in the hunting pack and between the parents and offspring in the family. The hunting pack could not continue the harem system of the apes. Monogamous mating, growth of psycho-biological inhibitions of sexual out-

[1] Human Evolution, Past and Future in Burnett, (Ed.): *This is my Philosophy.*
[2] Washburn and Avis: Evolution of Human Behaviour in Roe and Simpson *Behaviour and Evolution*, p. 432.

burst in the family group and care and solicitude for the young by both male and female parents were linked and established together and tended to spread. There was no future for those with whom cortical control of sex did not replace hormonal control, nor could repress strong emotional outbursts of anger, rage and aggressiveness. Not only the pugnacious, aggressive and uncooperative individuals but also those who could not make much of their wits and tools went hungry and could not reproduce nor survive. Among the living apes and monkeys who are all vegetarians in their forest-habitat, the adult males though they may direct food expeditions do not share the booty nor show division of labour within the troop. The ape-man's hunting ways introduced an elaborate economic cooperation, the practice of food-sharing and a social hierarchy. This transformed his impulses and habits as well as social life and relations. Primate terrestrial instincts were replaced by gregarious and migratory impulses and habits as the incipient humans herded together and traversed much wider areas than did the forest-dwelling apes. Their wider range of operations and greater mobility led to greater division of labour and social cohesion stablilizing social relations and organization.

Social feelings and sentiments of a flexible and expansive rather than rigid instinctive kind waxed stronger and stronger, came to direct all fundamental drives and crystallized themselves into enduring social values. To be human meant to be loving and tender, talkative and cooperative. The new ecological conditions and way of living in the grasslands fashioned a human nature out of the ape's nature. At the foundation of development of a puny creature, endowed only with brain and hands, lies the quality of social feeling which creates and maintains the most diverse patterns of social relations, values and organisation under different kinds of environmental pressure.

Man retains several qualities of the ape such as strong family affection, playfulness and curiosity, but with the hunting ways and habits entrenched in his nature he has renounced the latter's fearfulness and helplessness. Perhaps he has an over-dose of anger, rage and aggressiveness which the hunting way of living for eons has built into his hereditary make-up. It is possible that the fusion between the timid, defensive and herbivorous ape and the combative, pugnacious and omnivorous ape-man is responsible for the ambivalence of fear and aggressiveness, tenderness and cruelty in human psychology. Clinical investigations have shown that overt aggression and inner fear often go together, perhaps echoing man's mixed descent. No doubt the fusion between the aggressive and the tender feeling or behaviour is inadequate and imperfect in man who adopted a way of living far different from that of his vegetarian ancestors.

The incipient humans though relatively vulnerable yet adopted predaceousness due to their carnivorous predilections in the grass-lands and plains that they invaded. They could roam in all directions, though not

without fear and danger, and made tentative experiments in the family and the social organisation, responding in novel ways to unfamiliar external conditions. Plasticity of responses and behaviour replaced the old rigidity, especially because the life of the incipient humans alternated between carnivorous aggression and fight in the hunting pack and protection and care of the young ones in the well-knit family group. Man is not predatory by instinct and long tradition. He took up hunting only in the later phase of his evolution, after the development of upright posture together with his invasion of the grass-lands where he could run for offence and defence. Accordingly, unlike bitch wolves, human mothers did not run with the hunting pack but tended their offspring in the cave-shelters. As much as the hunting ground, the "hearth and home" were the cradles of human psychology. Without the economic interdependence between man and woman and their offspring and the emotional interchange within the family there would have been no man. It was the family which tamed at once the male human beast's fierceness and aggressiveness so that he could bestow tenderness and affection on the children. It also curbed the hormonally determined male lust or female heat so that the family did not split up due to chronic sexual contests and bickerings, and the subordinate males could cooperate with the parents in raising and training the young.

Evolution of the Social Impulses

The social affections had survival values in the evolution of early man who was selected and adopted to think, feel and behave as a social animal. Without his basic genetically determined social impulses with their complex interwoven strands of love, tenderness, foresight, compassion and altruism, neither the compact stable family could be founded, nor the cooperation of individuals in clan, tribe and community for offence, defence and food-acquisition, nor again the perpetuation of accumulated tradition were possible. Constant selection favoured the propagation of the social impulses and the modification of ego-centric impulses in the genetic system among larger groups and over longer periods of time than the individual and his life. The human animal came thus to be hereditarily endowed with a much larger measure of the social impulses than his ancestors and colleagues, first in the family, then in the larger kinship group, and finally in the community and culture in ever-extending circles. Such psycho-social adaptation was the direct consequence of natural selection and evolution of heredity.

Gregariousness, moderate size of population, and permanent social traditions were linked with one another, furthering more aggregation, better social organisation and more protection to individuals. Geneticists point out that evolution is rapid in any species distributed in partially isolated "demes" but is accelerated in moderate-sized rather than in very

small "demes."[1] The size of larger human inter-breeding communities such as clans, tribes and folks aided the selection of characters of smaller biological advantage and the stabilization of the genotype of the species. A large and homogeneous population sorts and sifts, and keeps under control gene-variations so that these latter may be selectively advantageous. The continuity of the genotype and the stability of the social heritage must have aided each other during the evolution of man. Migration between the "demes" and occasional fusion of the "demes" maintained the genotype. It also furthered the processes of man's social integration, promoted collective enterprise and adventure and improved his stock of tools, weapons and implements and ideas, values and symbols. With the improvement of habits of association and cooperation, leadership and obedience and general conformity to stereotyped patterns of behaviour, larger groups could be formed aided by language and enlarged kin sympathy. Gradually there developed not only a "consciousness of kind" within the tribe, folk and people, but also a stable heritage of tools, territory and traditions bequeathed from one generation to another—the beginning of the human culture.

Tool and Human Evolution

Man's ecological hunting habits and use of tools dominated the latest phases of his evolution. The emergence of *Homo sapiens* was synchronous with the cycle of cold creeping out of the Arctic zone. A relatively hair-less, tropical animal as he was, he sorely needed shelter and clothing to carry him through the long winters. For this he found most serviceable his long, mobile and manipulating hand which wielded and made tools as well as spun and wove and constructed shelters. On the one hand, the ape-man's flexible, manufacturing hand, freed from use in locomotion, favoured the development of his brain and central nervous system. On the other hand, his brain governed the use of his hand in complicated movements within sight of his exploring and scrutinising eyes, and constituted him not only a tool-using but also a tool-making and tool-changing animal. The ape became a tool-user before he became a man.

Australopithecus, sometimes called Near Man of Bechuanaland and Transvaal, had brains no larger than those of chimpanzees or much exceeding those of gorillas though he could walk on two legs in the grassy open country, and had teeth more closely resembling those of men than apes and made tools. It is probable that when the anthropo-hominids came down from the trees, and became scavengers and hunters their legs and jaws evolved in advance of their brains and that they learnt to use and make tools for defence against the carnivores. According to Leakey, tool-using man

[1] Carter, *Animal Evolution*, and The Theory of Evolution and the Evolution of Man in Kroeber, *Anthropology Today*, p. 340.

originated in Africa, the fossil remains of the earliest man being found by him recently in Tanganyika where he lived 700,000 years ago. (*Zinjanthropus*)

Tool-making, which evolved as a social heritage when the hunters lived in close cooperating groups, must have stimulated increase in brain size and development of the nervous system—the transition from the small-brained *Australopithecus* (skull-capacity, 600 c.c.) to the larger brained *Pithecanthropus* (skull-capacity, 775 to 900 c.c.) and then from *Pithecanthropus* to the even larger-brained *Homo sapiens* (skull capacity, 770 to 2000 c.c.). *Homo rhodesiensis*, found in Rhodesia, made tools by grinding or hammer dressing, rather skilled and advanced techniques. *Pithecanthropus* found in Java (900 c.c.) and China (1300 c.c.) who shows a greater admixture of the traits of apes and modern men than the former, used tools made of quartz—a difficult though not efficient material. *Homo neanderthalensis* who flourished in western and southern Europe about one hundred and fifty thousand years ago was also *homo* but not yet *sapiens*. He showed a definite advance over *Pithecanthropus*, but the gulf between him and *Homo sapiens* was also yawning. Both *Homo neanderthalensis* and *Homo sapiens*, two ultimately distinct forms of the human species, must have sprung from the genus *Pithecanthropus*. The Rhodesian man and Solo man from Java are regarded as regional end products of the *Pithecanthropus* stage, having many common features both of Neanderthal and *Sapiens* variety, both early and late. About fifty to hundred thousand years ago *Homo sapiens* emerged and dominated everywhere displacing Western Neanderthaler, Solo man and Rhodesian man. Due to his sensitive and adaptable body and mind, use of a large variety of tools and capacity for collective action, *Homo sapiens* could easily exterminate all non-*sapiens* populations and endure successfully the rigours of climatic oscillations of the last glaciation. *Homo sapiens* showed a decisive mastery of the entire world environment. The distinguished paleontologist Chardin after his life-long study of fossil men concludes: "Judging by the impressive and constantly increasing mass of old Paleolithic industries which is being continuously unearthed in Central and South Africa, it appears very possible that the Dark Continent will be recognised "tomorrow" as the main laboratory in which man, after having been first formed as Homo, finally succeeded in reaching the level of *Homo sapiens* just before the dawn of the Upper Paleolithic times."[1] The physical anthropologist asks, tools or brains, which came first? The answer, in view of the discovery of the Sterkfontein accumulation of tools made by the pigmy and small-brained Australopithecines in South Africa, is that perhaps tools preceded brains.[2] They were able to discover and use tools though having the brain size of the apes. Their jaws, limbs and pelvis, however, showed more human than anthropoid features.

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[1] The Idea of Fossil Man, Kroeber (Ed.): *Anthropology Today*.
[2] Kenneth Oakley, *The Listener*, Dec. 19, 1959.

Modern palaeo-anthropology is now reexamining the various hominid fossil evidences now available from the beginning of the studies of human evolution. The data of the construction of tools, ceremonial burial of the dead, symbolic representation of animal or fossil types, control of fire and organisation of certain activities on a communal basis suggest that by the middle and late Pleistocene period a number of fossil forms, many of whom were not entirely human in structure, acquired a regular capacity for conceptual or "reflective" thinking and behaviour and use of signs and symbols. Thus some fossil hominids could develop and bequeath an external social heritage, similar to that of *Homo sapiens*—indisputable evidence of the beginning of the transformation from ape nature to human nature.[1] A human nature as well as a human structure are co-products of evolutionary processes under divergent ecological conditions.

The Adaptability of Human Nature and Behaviour

Man's fitness in the long selective process through which he has evolved has depended as much upon his large and fine brain as upon his whole human nature fashioned early by the use of tools as well as by true speech and symbolic representation. His body and mind are so constituted that he thinks, feels and acts with the whole of his brain, and with all his tissues and organs which achieve extensions and enlargements in his equipment of tools. Human nature grows as a whole. Tools, speech and long-term social relations add new components to it. As the early humans hunted, conversed and played together, drew cave-paintings and manipulated tools, their brains expanded forwards. And with mental development they could use and change more tools, achieve more marked control over environmental conditions, and inhibit instinctive and emotional reactions more effectively for harmonious social living. Human nature and behaviour became more plastic, adaptable and learned, and this had obviously greater survival value. With the establishment of learning capacity and behaviour human evolution took the form of the development and transmission of the social heritage rather than of further genetic change and elaboration of instinctive patterns. Man now developed and transmitted true traditions of various types of non-biological or symbolic activity that had no organic purpose or direction. His greater adaptability, sociability, logical thinking and educability, which are primarily due to his prolonged infancy; his richer and stabler emotional life, which springs from the primate interdependence of woman, child and man; and his symbol-making on the basis of words, images and gestures, which is both the cause and effect of his permanent social heritage, markedly differentiated him from his nearest simian kith and kin. But these were all slow growths and products of his

[1] T.R. Williams : The Evolution of a Human Nature, *Philosophy of Science*, January 1959; Boule, Marcellin and Vallois : *Fossil Man*.

larger, heavier and finer brain. It was the combination of these mental strands that ushered in a truly human nature—a distinctive human way of knowing, feeling and behaving, based on a genetically determined disposition for symbolisation.

Man's upright position, stereoscopic colour-vision, omnivorous diet and intellectual curiosity, coupled with his movement far and wide in the grass-lands and plains, stimulate an intelligent interest in things and happenings, and develop an ever-expanding world-perspective. These are correlated not only with his complex traditions of tools and techniques which subserve his biological and economic adaptations, but also with an elaborate tradition of words, signs and symbols achieving non-biological or symbolic values and behaviour.

Rudimentary Values and Symbolic Behaviour among the Higher Apes

Recent studies and experiments among the higher anthropoids show that they can create, and are guided by rudimentary values and symbols. They collect all kinds of objects, especially attractive ones, and carry them in their arm-pits as they walk about. This is an inchoate perception of "aesthetic" value. In their collective food-quest, migration, offence and defence chimpanzees and howler monkeys are governed by a well-defined system of serial subordination—dominance roles and statuses, grounded in acquired but inarticulate value experiences with a multitude of variations and shadings according to ecological and social conditions. They show a crude and viable, though not a stable and delicate balanced system of values, as postulated by Nissen. The latter apparently holds that, like men, chimpanzees have many values only indirectly related to primary needs, as food, sex and knowledge.[1]

With inchoate, undifferentiated and rudimentary values are linked rudimentary symbolic acts. The higher apes show fairly well-defined gestures of abasement, humiliation and 'sense of guilt' as they are caught by the leader of a band or troop in acts of encroachment upon sexual rights and accept punishment. Punishment is often symbolic in the sense that instead of inflicting serious injury the leader merely nips him painfully. In the division of food the male chimpanzee would show deference to his female companion even after she is pregnant and is not available sexually. Crawford mentions chimpanzees summoning one another by means of self-initiated gestures such as gentle taps on the shoulder. When shoulder taps become insufficient or slow in producing cooperation they would pull or act forcibly.[2] The chimpanzee can, therefore, use gestures symbolically, not as signs of action but as meaningful and directive cues. He can even

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[1] Problems of Mental Evolution in the Primates in Gavan: *The Non-human Primates and Human Evolution.*

[2] The Cooperative Solving of Problems by Young Chimpanzees, *Comparative Psychological Monographs*, Vol. XIV, 2.

construct some kind of a self-image as he indulges in phantasy-making and plays with what appears to be an imaginary pull-toy which is towed around an imaginary string.[1] In their play and teasing behaviour, Hebb and Thompson stress, primates show a capacity for abstraction and conceptualisation freed from the immediate situation. They observe: "The aggressive pretences that mask aggression, so evident in the chimpanzees, show an ability to separate a certain type of vocalisation of gesture from particular emotional states."[2]

Finally, territoriality is well developed among primates. A complex system of territorial behaviour is learned by them that reinforces monogamous habits and dominance roles and statuses, integrate bands or hordes within a certain area, and provide psychological and social advantages by favourably affecting goals and rudimentary values as well as dynamic actions and interactions many of which are acquired.

But even the natural cousins of man, due to their incapacity for abstraction and objectivisation of the symbolic processes of the mind as well as the absence of speech, cannot use sounds and gestures symbolically for communication except in a very limited way and in a small group.[3] Nor can they have any sense of self-awareness, self-valuation and self-transcendence. These latter enter into the core of the human personality structure. Values and meanings can develop only with the capacity of the mind for conceptual processes and the use and manipulation of symbols in speech, the two being linked with each other in mental and behavioural evolution. Only man can communicate his complex inner world through his speech, and share meanings, values and purposes with fellowmen separated by time and space through the symbol complex. He develops, therefore, a new dimension of psycho-biological adaptation, and his adaptation is to a world that is unlimited psychologically. Only rudimentary and fragmented self-awareness and values are discernible among the apes.[4] Self-cognition, self-valuation and self-transcendence are unique in man due to the enlarging role of his central cortical function, and become increasingly significant in the general evolutionary trend. Imagination, intuition, and valuation and symbolic intellectual, aesthetic and religious response to the cosmos as a whole constantly enrich man's cosmos-view and enable him to be at home with the cosmos. A symbolic world of non-biological ideas, values and experiences is super-imposed upon his biological and economic world, and changes altogether his psychology and dimension of living and evolution.

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[1] Hayes: *The Apes in Our House.*

[2] The Social Significance of Animal Studies in Lindzey: *Handbook of Social Psychology.*

[3] See also Hallowell: Self, Society and Culture in Sol Tax (Ed.): *The Evolution of Man,* pp. 351-354.

[4] See also Thompson: Social Behaviour in Roe and Simpson: *Behaviour and Evolution,* pp. 293-294.

Human Adaptation, Essentially Symbolic

Man is unique among the animals in his capacity for associating certain tags, signs or symbols with natural objects, events, behaviour, values and experiences. Furthermore, he has evolved certain cognate or subsidiary dispositions viz., of making use of his voice to initiate or play with sounds of his own and of the world around him, and of his gestures and movements for reproducing the recurrent rhythms of nature and generally exploring, manipulating and controlling sounds, lines, surfaces, colours and tones of the environment for his sensory and motor satisfactions. On these super-animal sensory and motor ranges of experience is reared the rich and vast super-structure of his aesthetic values and symbolic thought and living which indicate the potentials of a true human nature. From the dawn of human evolution up till the present, man's extra-organic symbolic complex of devices and appurtenances, abstractions and concepts integrated into values beliefs and traditions, supplement his physiological equipment and behaviour, and undoubtedly play the major role in accelerating and directing its trend. Such mechanisms of pre-adaptation and directiveness are sometimes called "neurobiotaxis" and are favoured by natural selection and the evolution of heredity.

The evolution of mind and the evolution of society and values, mutually reacting on each other through the symbolic medium and procedure, and the selection of the environment by the group, community or genotype gradually develop a well-nigh common human nature, with similar genetically determined modes of response to internal needs and external stimuli. In spite of differences in their patterns and combinations, there are common inherited racial instincts of man. A human nature is both genetically and culturally determined.

As anticipatory and directive symbols and values emerge in man, these not only transform his nature and proclivities, but also become a part of his genetic heritage. Due to natural selection, he develops predispositions to stable and dependable sets of symbols, values and traditions in his social milieu, full of conflicts and hazards. Symbols, values and traditions are internalised as his conscience, and also conserved and organised in his external cultural inheritance that plays a more significant role in promoting his survival and progress than his genetic inheritance. As values are learned, acquired and transmitted through education and socialisation, these foster and guide an ever larger and more complex range of cooperative activities, building up and integrating the social community. Man's predilection for stable and shared values, and his capacity for their intelligent manipulation and transformation by association establish and maintain enlarged and intensified communion and cooperation in society, and promote the extension and survival of his group that comes ever more to comprise mankind-as-a whole.

Person—Values—and Society are inseparable, and develop together through a ceaseless dynamic interchange, being different facets of the general evolutionary trend. Values, as these have their primacy for man subjectively and their objective utility in the survival, expansion and total well-being of the human community, leap beyond biological and social opportunistic ends. The differentiation between instrumental and intrinsic ends and values is crucial in the long-term evolution of mankind. In his constant endeavours to attain and promote intrinsic and transcendent values man remoulds his own nature and remakes society. He seeks to establish an ever greater and richer harmony with the cosmos-as-a whole, constantly recreating what he has learned, changing his modes of social adaptation and reorganising and achieving his potentialities. This is the only way of his evolution.

CHAPTER VI

BEYOND THE MAMMAL : RETARDATION, DEPENDENCY AND SOCIETY

Homo's Brain and Retardation

The human child's long infancy and slow somatic, mental and behavioural growth were crucial for the emergence and development of a human nature. It is man's uniquely long infancy, prolonged childhood and youth and delayed puberty which have been an indispensable psycho-biological basis of Homo's development and individualization. For the sake of the largeness of brain-size his infancy is extended, puberty delayed and youth and life as a whole lengthened. Of all mammals, he shows the longest period of both pre-natal and post-natal helplessness and dependence of which the bio-psychological and social significance is being just discovered.[1] Human mind, society and values are all born of human retardation, and prolongation of human dependence, nursing and immaturity beyond natural limits.

The improvement of the size of the brain had been correlated with the slackening of its rate of growth and the prolongation of childhood in the natural history of the primates. The embryologist Berrill points out that man's infancy is not only projected into his later life but he carries his pre-natal condition through into childhood. This applies to both his hairlessness and the retarded development of his brain. Shortly before birth the embryo of the chimpanzee shows almost a bare skin but in the final month it has a hairy development and is born a typically hairy animal. The human embryo sheds at birth most of the original fine coat of hair all over. A small and decidedly foetal type of face and a much thinner skull are also consequences of the brain's expansion in the growing embryo. These are as pre-natal or foetal features as the hairless skin leaving the brain region largest in the embryo resulting from the squeezing of initial space. Other characters in which man resembles the foetal rather than the adult mammal are the late closure of the sutures of his skull, the posture of his head, the form of the ear shell and the supposition of the jaw under the forehead. Man is unique in retaining in his adult body many pre-natal or foetal features which constitute the basis of his being human.

First, man has lost most of his hair, according to Berrill, as an incidental accompaniment of his brain expansion, yet to some extent part of this expansion comes directly from the loss of body hair. Second, the

[1]Countt: *This is Race*; also Keith: *A New Theory of Human Evolution.*

large size of the brain is promoted by the relative reduction of the area left for the face and the bony substance of the skull in the embryo and is restricted only by the pelvic opening of the mother. Due to the limitation imposed by the skeleton of the mother much of the growth of the human brain takes place at a late stage of foetal growth and is also postponed until after birth. The study of pre-natal human behaviour by Hooker and Herrick shows that it is only at fourteen weeks of foetal life the higher integrating apparatus of the thalamus and perhaps also the thalamo-cortical connections reach a stage of differentiation marking the beginning of functional capacity. Herrick observes: "These higher levels of the brain mature much later than do those of lower brain stem and the complication of their internal structure continues for many years after birth probably as long as learning capacity lasts."[1] The sequence of development of the cortical associational tissues which are the last to become functional is not yet fully known. After the birth of the human child the prolonged period of careful nursing, protection, sleep and rest enables the brain and the organised system of nervous elements to develop with ever-increasing intricacy and subtlety of neural connections, together with the branching of the nerve-fibres and the elongation of the branches. Retardation facilitates the development of the apparatus of nervous integration, including learning capacity and behaviour. The largest and finest brains belong to those human infants with their greatest growth yet to come. "Such infants," remarks Berrill, "are inevitably those that are most infantile at birth using the term in its literal and complimentary sense."

Physiologically speaking, the lengthening out of growth of the body permitted an enhanced and a more complex and adaptive brain development. Man's largeness, nakedness and immaturity at the time of birth are correlated with both a large brain size as well as the prolongation of the later phases of brain elaboration, fineness and sensitiveness. Kummer shows that the human skull cannot be considered simply as a product of "foetalization of the anthropoid skull. Rather it is differentiation in another direction, owing to the increase in size of the brain and the neurocranium."[2] Berrill observes: "Inasmuch as a highly intelligent brain must be both fairly large and decidedly adaptable, the longer the delay in attaining the final state the better the brain will be. There has been as much incentive to prolong the later phases of brain growth and differentiation as there has been to grow one larger and larger."[3]

Comparative Retardation in Man and Ape

We already see a retardation of development in the case of the apes—

[1] *The Evolution of Human Nature*, pp. 310.
[2] Quoted in Bertalanffy: A Biologist Looks at Human Nature, *The Scientific Monthly*, 1956.
[3] Berrill: *Man's Emerging Mind*, pp. 115-118.

a longer period of gestation as well as of childhood as compared with other mammals. Not only is the number of offspring reduced, but the period of their dependency and nursing prolonged in the case of all primates. Man's retardation is much more marked than even in the case of latter. The slowing down of the development of higher mammals and in particular of the apes and man is called "retardation" by the Dutch biologist Bolk.

While man's development from ovum to birth requires about 280 days, the same development in the chimpanzee takes only 251 days. While the period of human pregnancy is about 266 days, the period of gestation for the chimpanzee is 231 days and for the lower monkeys between 150 and 160 days. Schultz estimates that the duration of post-natal growth in man is 27 times the pre-natal growth, whereas in the macaque, for instance, it is only 15 times greater than the pre-natal growth; for the chimpanzee it is 15.7 times.[1] Hooton comparing the infantile situations of higher apes and men also points out that man grows very much more slowly than the apes and that growth takes place in the chimpanzee and orangutan at a moderate rate until about the seventh or eighth year when the apes begin their pre-adolescent spurts. He observes: "With the further prolongation of foetal development, the number of offspring produced at birth is still further diminished, because the continued intra-uterine growth of the foetus demands more and more space in the maternal womb, the expansion of which is strictly limited. The long pre-natal period and the protracted helpless infancy of man and the anthropoid apes are pre-requisites for the ultimately high development of the nervous system and of the mental powers of these families."[2] The inferiority of man's constitution and the retardation of his growth permitted the conjunction of several factors and trends that interacting with one another contribute to the individualization of man and the uniqueness of his goals, values and inter-personal behaviour.

Retardation and Human Variability and Educability

First, the slow post-natal development permits the growth and ramification of man's intricate, complex and plastic brain and nervous system. The evolution of the human mind is now attributed by many biologists, neurologists and anthropologists to the law of "retardation", "foetalization" or "neoteny," in Bolk's expressions. In the course of evolution the learning period of apes, ape-men and men underwent a slackening in rate and an extension in time. The learning period of a juvenile chimpanzee lasts only about one year. During this period the juvenile ape develops mentally much more quickly than the human child of the same age. Man shows the capacity for educability right into the adolescent and adult phases of development. This is correlated with the fact that the human brain

[1] Quoted in Muensterberger: On the Biopsychological Determinants of Social Life in *Psychology and Social Sciences*, Vol. IV, p. 18.

[2] *Up From The Ape*, p. 264; Compare also Howells: *Mankind So Far*.

continues to grow and develop throughout the first two decades of life. Ashley Montagu observes: "At birth the human brain is only 23 per cent of its adult size, and by the end of the first year the human infant has achieved 55 per cent of its total brain growth; by the end of the third year some 83 per cent. In the great apes the major part of the growth is achieved within the first year. In the rhesus monkey and in the gibbon 70 per cent of the brain growth has been achieved by birth, and the remainder is completed within the first six months. In the great apes the active period of brain growth occurs during the first eleven months, and in man during the first thirty-six months. Complete growth of the brain in man is not achieved until the end of the second decade of life."[1] Arthur Keith points out that in this prolongation of cerebral growth and development we see an important, "if not the most important, feature of human evolution—viz. the time taken to assemble and to organize the myriads of nerve cells and of nerve tracts which enter into the structure of man's brain." McDougall suggests that the time required for the nervous system to develop may be as important as the total complexity achieved. The improvement in both size and complexity of the human brain in which are rooted man's mental capacities is, accordingly, what the biologists such as L. Bolk and G. R. de Beer call a "neotenous" phenomenon.

Secondly, this accounts not only for man's superior intellectual and learning capacities, but also for the flexibility of human nature, marked by a much greater range, subtlety and variability of his impulses, needs and values than in the case of his nearest animal colleagues. Rensch shows that changes in the architecture of the human brain provide cerebral areas that can be used for higher functions. It also leads to histological changes and possibly differences in view of instinctive and learning behaviour. Man alone possesses the ventral region of the frontal lobe where is localized the motor speech centre connected with his verbal and symbolic capacities. Both the symbolic functions of the brain and the elaboration and refinement of its association, scanning and feed-back functions comprise qualitative changes that distinguish the human from the ape mind with its increased adjustibility and educability. Gardner Murphy remarks: "The longer the period of immaturity, the period during which the organism is plastic, the greater the number of values it can form, the more complex the hierarchies it can establish in both its intellectual and its emotional life, the greater its opporutnity for experimentation."[2]

Thirdly, we encounter greater range, complexity and effectiveness of social conditioning and learning as well as of means of social control in man that are linked with the time curve of his behavioural development differing strikingly from that of other mammals. The latter run swiftly

[1] *Anthropology and Human Nature*, pp. 325-326.
[2] *Personality*, p. 284.

through the period of their somatic and behavioural growth and soon their sexual maturity is reached. Alex Comfort thus contrasts man and other mammals in respect of their patterns of early growth: "Man is born helpless like a kitten; he grows at about a typical rate for a warm-blooded animal up to the age of four or so. If he followed the same programme as a sheep or puppy, then allowing for the different time-scale he would be sexually mature and fully independent at about nine years old. But instead his growth becomes slower, and a whole extra period of delayed growth and dependence on the mother is put into the growth curve, between the ages, roughly speaking, of four and twelve. Then the tempo suddenly quickens, growth and development become rapid, and adolescence leads on to sexual maturity." A full-grown human still in some respects resembles more a baby ape than a grown-up gorilla. According to Cuenot he can be considered a gorilla foetus whose development and growth have been greatly retarded. The characteristic shape of man's growth curve gives him his uniquely long periods of childhood and youth, and the opportunity for a much longer period of learning and conditioning which is the basis of his distinctive family pattern which is the basis of his social organisation, mental development, psycho-social adjustment and acquisition and experience of values. Bertalanffy considers this as an indispensable prerequisite and basis of human behaviour and culture.[1] Socialisation, education or conceptual thinking in the human species evolve with "domestication" and the increased dependence of the child on the family. These are psycho-biologically rooted in the longer duration of his sexual immaturity and dependence on the mother as well as his life-span than in the case of any other mammal. Youthfulness with associated joy, vigour and intensity of life distinguishes man from the higher apes. Human mind and values have improved as much as have the youthful time, freshness and zest of the life of the individual. The next step in human evolution is to have a longer and more thorough-going youthfulness, gusto and adventurousness in mind and spirit.

Childhood and Human Evolution and Behaviour

Fourthly, the prolonged infancy leads to the intensity of the mother-child relationship whence stems the entire pattern of man's inter-personal relationships and values. It is significant that the human baby needs and obtains extensive paternal care at a time when his sensory and neural equipment is well completed. This is a situation which is not encountered in the animal kingdom, and has important mental and social consequences. The parent's training is imprinted on the child's nervous system that being less differentiated and less diversified than in maturity invests parental values with an absolute, blind and compulsive character (the Freudian super-

[1] A Biologist Looks at Human Nature, *The Scientific Monthly*, Vol. 82, 1956.

ego) and relegates their opposite tendencies into the unconscious (repression). Here we have the biological root of the resolution of value conflicts by the mechanisms of man's conscience at the unconscious level. For man whose impulses, needs and values are far more numerous and competitive than in animal, the mechanisms of interiorisation of parental and social values and of repression of undesirable impulses, dispositions and trends of behaviour in the unconscious comprise an important pre-requisite of his mental and social development. The compulsive submission to certain values conceived in absolute terms not only prevents the waste of psychic energy of the infantile self due to inner antagonisms that are habitual with it but effects socialisation that obtains impulsion from both the conscious and unconscious forces of the mind.[1] Karen Stephen remarks that it is "the super-ego's fantastic slapdash character (that) has rendered man's evolution so miserably slow and full of set-backs."[2] There is no doubt, however, that the tyrannical and unadapted nature of the child's conscience is as important an aid to his mental and social adaptation and moral progress as the "harness" with which he is sometime taught to walk.

Fifthly, with prolonged infancy and dependency the play period is automatically extended in duration. According to Gross, play has important survival values for a species inasmuch as it trains the young ones for the strenuous tasks of adulthood. In the human species, the child's curiosity, play and delight in experiment with its trials and errors are seen to persist throughout life, valuable traits for his mental advancement and control over the environment. Play and make-belief are deliberately cultivated and fostered in the environment of the family, the kinship group and the larger society, eliciting and stimulating not only his intelligence and social affections but also his freedom and creativeness. Play with its collective zest, excitement and irresponsibility is also a direct incentive to symbolic expression, construction and communication. Any kind of spontaneous activity detached from the biological context builds up the symbolic pattern of behaviour on which the entire social tradition and culture are based. Protection from biological pressure together with disengagement and play in infancy, childhood and youth made man the symbol-maker and user—the artificer of the arts of culture—and lifted his learning ability and behaviour to a new dimension. In the dramatisations of childhood and youth he found opportunities not only to learn, explore and experiment in terms of non-biological goals and values, but also to integrate present and past values and experiences, imagine possible and impossible situations and values and indulge in forward-oriented visions, dreams and reveries. The acquisition of both practical skills and techniques and works of imagination and art was possible, due to the release of child-

[1] Mukerjee, *The Dynamics of Morals.*
[2] Waddington, *Science and Ethics*; and Flugel: *Man, Morals and Society*, p. 260.

hood and youth from the tensions of competition and struggle, greatly aiding and accelerating the development of culture. Phantasy, myth and vision detached man from the external world, revealed his inner nature and projected into the external world vivid images from the unconscious—angels, gods and demons which led him in the direction of self-actualisation and self-transcendence.

Sixthly, the production of one human offspring at birth instead of several and the prolongation of its helpless period interacting with each other favoured the development of tenderness in the individual and its evolution in the race. Man's prolonged childhood greatly strengthened the affective ties between parents, child and siblings. It encouraged solicitude and care and made education more important by making it longer and lasting. Parental tenderness and training are linked with each other in the "individualization" of man. Yerkes in his remarkable studies of mental life of the primate has shown how some of the great apes who have a gestation period of at least 7 months and wean their children at about four months show gentleness and care almost on the human level.[1] The orang and the chimpanzee mothers are known to aid their offspring to walk and climb, refrain from doing certain things and encourage them at a later stage of development to do these. Yerkes and Yerkes observe that to "refrain from the use of such terms as educate, teach, train, merely because the subject is infra-human would seem indefensible, since as a fact the chimpanzee mother, apparently with definite intent, encourages and in many ways aids her infant to achieve locomotor independence to walk, climb and eventually to run about and play in a variety of ways and freely."[2] Not before gentleness and solicitude were firmly imprinted on the mental make-up of the human species, teaching and learning could make much headway.

Permanent Sexuality and Stability of the Human Family

The family becomes an enduring and universal institution for the human species due to the above co-acting psycho-biological factors and trends. To these should be added another formative trend, viz. the discontinuance of the periodicity of human sexual behaviour in striking contrast with other mammals. Man has a continuous sex life unlike most mammals. He experiences sexual desire in all seasons, and also takes a long time to reach a period of non-reproductive "post-maturity." All the anthropoids tend towards non-seasonal and active sexuality. According to Yerkes, the transition from a seasonal period of heat to an annual menstrual cycle in the female and a trend of the male's continuous sexual

[1] Social Behaviour in Infra-human Primates : *A Handbook of Social Psychology*, pp. 973-1035.

[2] Ibid. p. 1013.

ardour show the following order: gibbon, orangutan, chimpanzee and gorilla, man representing the anthropoid climax.

Beach describing the evolutionary changes in the physiological control of mating behaviour in mammals shows the progressive phylogenetic decrease in the importance of ovarian secretions to sexual drives in female mammals and suggests that this change in apes and men is directly related to the increasing contributions made by the cortex and the higher nervous mechanisms.[1] Man is unique as both a hyper-sexual and sex-tormented animal, whose period of sexual growth and maturation relatively to his total life span is longer than that of the anthropoids. His permanent sexuality which is a basic factor in his total mental evolution comes inadequately and precariously under the control of his cortical system. Excessive and continuous sexuality and potentially maladaptive sexual behaviour are uniquely associated with each other in man, bearing evidence perhaps of genetic transitional processes in his life-history.

Klaatsch suggested long ago that the permanent sexuality of man has brought about the development of the permanent breast as an important human secondary sexual characteristic. Both these, the permanent breast which is not visible in the anthropoids and enhanced sexuality, are the organic roots of inter-personal interest of the humankind.[2] Secondary sexual characteristics have developed much more in the human species than in any other animal. In no species of apes and monkeys do we come across the permanent breast and wide pelvis as in the human female. Both these characteristics indicate her capacity for reproduction and care for the offspring. The pelvic dimorphism of the human female is related to the large cranium of the infant and also its bodily immaturity; while her permanent breast is the index of its increased dependence and nurture by the mother. The smoothness, plumpness and suppleness of the female body and the permanence and firmness of the female breasts are some of the striking results of the domestication of the human mammal, and the change from forest life. The hairlessness, particularly in woman, facilitated the pleasurable stimulation from intimate bodily contact with both mate and offspring. Both the tender attachment between man and woman and the loving care and protection of the child grew out of the happy physical association. Freedman and Roe observe: "As in some other mammals, man's sexual arousal is not confined to his genitalia but is intensified and dispersed over his body to orifices, breasts and the skin surface. Sight, smell, hearing, tactile feeling and taste may serve as transmitters of stimuli for sexual excitement. This spread and augmentation of erotic excitants is important in man's survival as a species and, as psycho-analysis has shown,

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[1] *The Psychological Review*, 44.
[2] Weston La Barre, *The Human Animal*, pp. 104-108.

in the development of his personality."[1] Sexual stimulation and play, short of copulation, are far more significant forms of sexual activity in man than in the case of any other animal. These are based on the subtle and complex display of secondary sexual characteristics that arouse erotic attractiveness of man and woman which is then subtly blended and integrated with the pattern of reciprocal tenderness and attachment that aids the attainment of full sexual development. In the humankind woman's breasts and lips are cherished instruments of sexual love and protectiveness that eclipse the primate intimacy and attachment. Woman's bosoms that are not directly connected with the sexual act comprise the most prominent and delicate secondary region of love in her body and have acquired a strong love and aesthetic value rather than sex appeal for man even from his adolescence. Human culture makes these the symbols of feminine loveliness and protectiveness—the dual sources of durable marital attachment portrayed and idealized in art and literature.[2]

The Role of Sexual Dimorphism in Human Evolution

In the first place, man's permanent or non-seasonal sexuality means hyper-sexual activity which far over-reaches his needs of procreation. Hyper-sexual man procreates far beyond the limits of his subsistence. Secondly, the increased sexual dimorphism in the human species is correlated not only with the increased closeness of the child-mother bond, but also with heightened interpersonal bond between the sexes. Both among anthropoids and humans sexual and social behaviour intermingles. According to Kohler, sexuality among the chimpanzees serves social rather than mere reproductive needs. He observes: "The sexuality of two chimpanzees is as it were less sexual than that of the civilized human being. Often when two chimpanzees meet one another, they seem to "sketch," or indicate, movements, which can hardly be classed definitely under either the category of joyous or cordial welcome, or sexual intimacy."[3] This is of great import for both anthropoid and human mental evolution. Sex in the human species has multi-dimensional functions and values, viz. the biologic function and value of procreation, the socio-cultural function and value of recreation, and the aesthetic and spiritual function and value of communication and communion. The multi-dimensionality of goals and functions of human sex or its independence of the original biologic goal and function of procreation are due to the biologic fact of man's retardation —his prolonged infancy and childhood and delayed puberty. According to De Beer the human ovary reaches its full size at the age of about five and this is about the time of sexual maturity of the apes and presumably

[1] Evolution and Human Behaviour in Roe and Simpson (Ed.) *Behaviour and Evolution* p. 467.
[2] Mukerjee, *The Horizon of Marriage*, p. 47.
[3] Kohler, *The Mentality of Apes*, p. 303.

of man's ancestors. The human body is, however, not ready for the reproductive gland to function until several years later. The retardation is due to the action of hormones which play an important part in regulating the speed of development.[1] In man there is an activation of sex hormones in the pre-natal stage, but from birth to puberty sexual activity is latent or quiescent with pre-genital rather than genital instinctual aims. This has introduced various peculiarities in human sexual strivings and goals. It was the genius of Freud to discover and expound the psychological and social repercussions of the interruption of libidinal development of the human child by the "latency" period connected with the biological fact of his prolonged dependence and never fully outgrown infantile way of life. The complex sexuality of adult man and woman is now found by the Freudian school to be derived from a number of component tendencies, more or less independent, that are present in the infant and that undergo a process of normal structuring and development.[2] From the age of five when the "latency" period occurs to puberty, the sensual components of the libidinal hierarchy become inoperative. These are reactivised at puberty defined as the stage of "genital primacy" constituting the maturation of sexual behaviour that hides many component tendencies of childhood. These not only underlie normal erotic satisfaction but exercise a most widespread influence in non-sexual behaviour. Imagination, phantasy and sentiment of the growing man play a dominant part in his very complicated and plastic sexual feelings and behaviour. The sexual dimorphism and disparate mental development of man and woman are related to the complex divergent sexual needs and values of each sex, whence stem idiosyncratic modes of sexual expression and play in both normal and abnormal aspects in human culture.

The Civilizing of Sex

The closeness of the emotional bond between woman and child and between man and woman are writ large in their physiques. Civilization is aided by biology that makes woman's breasts conspicuous, and yet not directly provocative of sex. This introduces a wide range of gentle and tender secondary sexual behaviour and sophistication that reduce masculine aggression, slow down the conquest of woman's body and prolong the reciprocal love-play to the enhancement of pleasure of each partner. Man has risen above the mammalian dispensation in respect of sexual excitement at the rutting season. His sex drive is less explosive and more steady and continuous. It can fuse readily and subtly with various other drives. Sex in fact interlaces with the whole range of man's desires, interests and activities, integrating his mental life and leading to higher reaches of ex-

[1] de Beer: *Embryos and Ancestors*, pp. 75-76.
[2] See Roheim: *Psychoanalysis and Anthropology*, pp. 409-413.

perience. Hunger and sex are the major drives of men but it is through strange and devious biological steps that sex has reached its present evolutionary role. Sex in man is much more pliable, complex and productive than hunger. If hunger is the mother of material inventions, sex is the mother of creative spirituality. Human sexual behaviour, grounded in mammalian sex biology, is marked by the subtle integration and mutual adaptation of attitudes of man and woman that evolve and coalesce with many family and social functions and interests in the course of social development. Among the mammals only man, with the sole exception of the domesticated milch animal, has the permanent breast with its mammary glands that undergoing adaptive evolution are at once the cause and effect of the "domestication" of man and the stability of his family. The permanent human breast assures nourishment of the new-born and dependent child. It is favoured by natural selection and is the visible sign of male selection of females.[1] It bears the impress of the progress of sophistication and the decorative arts of human culture.

Art, fashion and tradition in different cultures and epochs select those ideals of physical beauty in both man and woman that cover the entire range of possibilities of bodily form—delicate and tender or full and luxuriant, hard and ascetic or soft and sportive for effectiveness of love play and reproduction. Secondary sexual characteristics, especially the features and expressions of the face, and symbolic gestures and behaviour comprise the chief appeals of human love. An interplay of reciprocally adjusted sensitive sexual responses, both overt and symbolic, subdues the male mammalian fury and subordinates the function and value of human reproduction to those of play, communication and communion. The discipline of sexual behaviour at the biological and sensual dimension which the prolonged learning period of man and his aptitude for inhibition and symbolisation foster, nay enforce, aids the structuring of sexual feelings and emotions into tender affections and sentiments in the family that gradually extend into ever-widening social groups. The polymorphous mammalian disposition is canalised and deployed into socially approved modes of sexual expression and remoulded beyond recognition.

The Tendencies Towards Domestication and Monogamy in Man and Ape

All this has important consequences not only on the stability of the human family but also on inter-personal relations in general. The prolonged and complete helplessness of the newly born offspring and the needs of protection of the pregnant and lactating mother and of nurture and training of the young demand the protective vigilance of the male and stable union of the male and female already visible in some of the higher anthropoids. The adaptation between parents and offspring evolves with—man's

[1] Compare Klaatsch: *The Evolution and Progress of Mankind*, p. 156.

"domestication" and increased control over food and shelter and defence and care of offspring. Among the primates the large size of the baby prevents it from being carried on a hunt and requires the cooperation of both male and female in feeding and care. Such protection becomes continuous as the female continuously bears and nurses an offspring. "Monogamy," observes J. Maynard Smith, "is in the main confined to those vertebrate species in which the activities of both parents are necessary either in feeding or protecting the young, or, in birds, in building a nest or in incubating the eggs."[1] It is found among many species of mammals and nest birds, at least for a single breeding season. The longer periods of lactation and infancy in the case of the primates as contrasted with other mammals favoured a stable union between male and female, which may be regarded as a survival characteristic favouring the stocks which give natural selection the best opportunity for the care and protection of the mother and the rearing of offspring. The orang-outang, gorilla and chimpanzee males have been observed to sit on guard at the base of the trees in which they have built nests for the pregnant females. They are essentially the defenders, although they also assist in the feeding and training of the young.[2] Jennings has rightly observed: "The tendency towards a permanent cooperative life career on the part of two parents is powerfully reinforced by the long period of dependence of the young. Marriage is life-long, even though the care of the offspring is not. Permanent monogamous marriage has arisen independently, through similar functional requirements, in the mammals and the birds: the biological needs giving origin to it being much the more numerous and powerful in the higher mammals."[3]

Contrasted Social Roles and Set of Dispositions in Early Man

Homo sapiens developed a bi-parental, relatively permanent family that had survival value because of the long continued cooperation of both parents in the feeding and care of the offspring it could provide, and the bi-parental family unit tended to be monogamous. Natural selection did not favour polygamy as in the case of some primates because of the difficulties experienced by the hominid male to provide protection and food for many females often assembled in a primate harem. Groups of several families hunted and foraged in the grass-land dividing it into a territory system whose rigidity or flexibility depended upon conditions of food supply and security. The biological rewards of success of a more or less stable monogamous union at breeding and adequate care and training of offspring were reinforced by several significant behavioural adjustments more suited to the brainy ape-man than to any other social animal like the wolf which like him hunted in packs. Carveth Read was the first to

[1] Sexual Selection in S. A. Barnett (Ed.): *A Century of Darwin*, pp. 233-243.
[2] Parsons, *The Family*, pp. 137-141.
[3] *The Biological Basis of Human Nature*, pp. 260.

point out the advantages of pack hunting placing a premium on the types of skill and cunning and cooperative activities that differentiate human from ape behaviours. Pack hunting introduced division of labour and the social tissues of authority and obedience integrating single family units into hordes, clans and tribes embracing several generations. Behavioural controls early developed in connection with the wolf pattern of hunting. The traditions of control and subservience, loyalty and cooperation were nurtured at the pre-cultural ape-man level by the wolf type of expedition. But Carveth Read failed to evaluate the psychological and social consequences of the women with clinging children being left behind by the hunting pack. Grounded ape-women could not leave their offspring in cave shelter and hunt with the pack. The division of labour established between the hunter and the keeper of the "hearth and home" was in fact more crucial for the transformation of primate into human nature. What was initiated because of the psycho-biological needs of care and protection of the human offspring was reinforced because of the intensity of the mother-child relationship, that was in its turn the outcome of the slow human post-natal development. On one side, social selection favoured parental, especially maternal protection and tenderness, contributing towards greater strength and survival of the children. On the other side, the feelings of affection, kindliness, tenderness and sympathy grew stronger because of heredity and difference in training and traditions in the home. Woman's identification with the child and the child's identification with her laid the foundation of human cohesion and intimacy, with corresponding feelings of anxiety and frustration caused by helplessness and loneliness. The woman who wandered with her children about her forest-shelter, gathering nuts, herbs, roots, and grass seeds, probably made the tentative beginning of cultivation by planting seeds. Around the forest-shelter, den and camp-fire with their safety, comfort and intimacy man came to know affections, ecstasies and exaltations in the family that found expression in the illogical and emotional quality of his speech. In the hunting ground he came to experience the wild rage, aggressiveness and joy of fights and combats. The contrasted set of dispositions still governs his ways of thought and feeling. The differentiation of social roles with their patterns of interdependence, love and conflict, rooted in man's bio-psychological composition, was linked with the evolution of human behaviour and culture. The more numerous the hunting community, the greater the cooperation and division of labour and the more complex the economy, involving not only the hunting enterprise but also food-gathering and domestic activities, distributed between the males and females and the various seasons of the year. All this required learning of various kinds that gradually lifted the ape-men from the non-cultural primate level to the lowest cultural level.

Human Origin and Sexual Latency

The climate and environment of learning and acquisition of tools and traditions was obviously provided by the bi-parental, monogamous, primate family with a stable domicile. It was in the domestic life of the primates that important behavioural transformations and acquired mating behaviours were witnessed that shaped and moulded the inter-personal relations of *Homo sapiens*. The investigations of Zuckerman and Carpenter in the wild have shown that among the sub-human primates, due to the dominance of the male leader, the subordinate and younger males are excluded from access to the females. Sexual attractiveness comprises the ultimate bond of individuals in the ape community. The emergence of this feature to prominence in the behaviour of the ape creates and maintains primate social organisation. But Carpenter points out that the sexual bond persists in the present-day species for long periods even without primary or overt sexual activity. The capacity of the subordinate or younger males to control the libidinous and aggressive impulses acquired an evolutionary significance. For in selection those males in the community are favoured who excel in these respects. Those young males who challenge the dominant male not only run the risk suffering defeat and expulsion but also serious impairement of their mating behaviour. Lajos Szekely suggests that in this manner the descendents of the primate troop or herd developed an ego organisation with its inherent hostility to instinct. The regulation of social relations of mature males by the threats and punishments of the high-ranking males met with in all species of infra-human primates accordingly has possibly led to the emergence of human sexual latency (succeeding infantile sexuality and preceding mature genital sexuality unfolded in puberty) and the evolution of the human super-ego system.[1] Freud postulated that a sexual latency period was specifically a human phenomenon and was related to the process of man's genesis. He observes : "The postponement and the beginning twice over, of sexual life has much to do with the transition of humanity."[2] The development of human latency seems to be psychobiologically rooted in the mating circumstances and behaviour of the sub-human primates.

Psycho-biological Roots of Human Morality

The unity and stability of the human family depended upon more powerful constraint as well as forbearance and control on the part of the younger and stronger males in respect of sexual gratification within the family circle than in the primate society. Social selection favoured what later on were crystallized into incest taboos as maintaining the integrity and continuity of the family, and reducing intersexual conflicts, bickerings

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[1] See Szekely; Man's Origin and the Latency period, *International Journal of Psycho-analysis*, 1957.

[2] *An Outline of Psycho-analysis.*

and contests that die hard in the ape community. Such taboos for this species of primate, no doubt, prevented the splitting up of the family, troop or horde when the strength of the chief or leader waned, or when his mistrust arising out of jealousy became anti-social and threatened his troop or horde with destruction. These constitute the psycho-biological foundations of human morality.

Etkins mentions among other human advantages the loss of body hair and the addition of ventral sexual intercourse. The loss of hair eliminated that favourite pastime of lower primates—grooming.[1] Ventral intercourse gave opportunities for reciprocal sex play replacing male sex outburst, and aided the development of amiable speech focussed round communication for sex exploration and amusement. With the elimination of the sexual roots of anger and aggression in the family milieu, facilitated by the definition and systematisation of the incest taboo and the deepening and extension of maternal love, sex occupied a considerable proportion of leisure time. The role of sexual recreation in the development of tenderness, affection, goodwill and "good manners" in early social behaviour can hardly be exaggerated.

All this was stimulated by, and stimulated the development of the forebrain, particularly of the frontal lobes of *Homo sapiens*. Coon mentions that the hominid's capacity for restraining rage reflexes in sexual behaviour and for good judgment, as the universal incest taboo in the integrated family demands, stem from the prefrontal lobes of the brain. Experiments on cats and monkeys show that the area of concentration for the suppression of rage is centred in the amygdala, which is very highly developed in man. Ward performing pre-frontal lobotomies on macaques found that they loss social controls.[2] Boland in a similar body of macaques removed small areas from different parts of the pre-frontal cortex only. Removal of each subdivision of the frontal lobes produces different and characteristic changes in behaviour, learning ability, emotive attitude, or other recognizable effects. The emergence of the tissues of repression and inhibition, on the one hand, and of social control on the other for which pre-frontal lobes of the brain seem necessary, is at the roots of the genesis of morality with a premium paid on prudence, loyalty and fair deal. Anthropoid nature lacks the neurological basis of morality. The increase of brain power and capacity for inhibition, the integration of the family and the beginning of morality through the exercise of prudence, foresight and social control among the ape-men went hand in hand with the discovery and use of tools and fire. Tools and implements increased the efficiency of the male as hunter, while the household fire reinforced the efficiency of the female as domestic and cemented social bonds.

[1] Etkins: Social Behaviour and the Evolution of Man's Mental Faculties, *The American Naturalist*, May-June, 1954.

[2] Coon, C.S.; *The American Naturalist*, September-October, 1955.

Division of labour beginning with the sexes in the integrated family of *Homo sapiens* gradually extended itself to different activities and pursuits for both males and females. It contributed towards the preservation and protection of the young and the aged that stimulated both the discovery of tools and weapons and the conservation and transmission of tools, traditions and techniques. The enlargement of division and specialisation of interests and activities called for an extension of the period of learning that was biologically met by the delay in attaining maturity on the part of the human young, permitting a longer period of learning. The secret of man's superiority does not lie, as we have seen, in the size of the brain before birth. The brain of the gorilla at birth is close to that of human infant. But the sutures of the gorilla skull close early and his brain will develop little more. By contrast the human brain will first spurt and then grow steadily over an extended youth. The price that *Homo sapiens* pays is a helpless childhood, but this is recompensed by its tremendously enlarged mental faculties and capacity for learning. Brains, tools and social ties were linked with one another in emerging man—brains that were adaptable and educable, tools that were transformed and exchanged, and social ties that were enlarged and intensified from the beginning of the grounded life of ape men.

Civilizing of Sex and Aggression in the Human Mammalian Family

Due to the operation of several factors comprising one complex, viz. (a) long oestrus period and continuous attraction and childbearing, (b) permanent and heightened sexuality, (c) cortical instead of hormonal control of sexual behaviour, and (d) dominance of concepts and symbols focussed round the taboos and injunctions against incest, monogamy played a unique role in the hominid's social and mental development. It is possible that mother-fixation and other complexes that drew the attention of Freud are due both to the precarious and retarded sexuality and long period of infancy of human infant, whose sensory and neural equipment matures early and the associated exaggerated tenderness and devotion of the mother to the child. It was the climate of profound bi-parental attachment, care and devotion that was largely responsible for bridging the gap between the man and primate, and for maximising the human qualities of love, tenderness and sympathy that were transmitted in the first instance by the female chromosomes, and in the second instance by tradition from one generation to another. As contrasted with most animal species the father is the ubiquitous member of the hominid family. On the one hand, it was the tenderly loving and solicitous woman who tamed the pugnacious male, the hunting beast. On the other hand, it was the male hunter, fender and provider that alone could train the male children in the masculine arts of defence and warfare. The early woman was the mother of the various arts and crafts such as weaving and pottery, if not agriculture. Training and

education which are the hominid family's universal functions also depended on its moral side largely upon the female endowed with a larger instinctive equipment of tenderness, sympathy and solicitous devotion than the male. Even activities connected with the maternal protection and care of the offspring required learning. Yerkes and Tomlin have shown the inefficiency in maternal behaviour of the primiparous chimpanzee.

It is the complex hominid mammalian family that accomplished the final domestication of the male, fulfilling, disciplining and canalising his heightened sexual and philo-progenitive drives. It played an ambivalent role in early man's development: it both fulfilled as well as shaped and disciplined two of his major urges viz. sex and aggression so imperative in his early natural history. This it could do by continually evolving a web of traditions, meanings and values that effected a compromise however viable between these conflicting but impelling drives that were indeed transformed into man's bodily organs and characteristics and somatized. For while a woman's firm breasts and ample hips fitted for love and reproduction attract man, she is peculiarly fascinated by man's strength of limbs and tall stature fitted for defence and aggression. Thus sexual selection is dovetailed into the transformation of the sexual and aggressive life of man in the milieu of the human family.

The discipline of the sexual life consists in the adult man loving all women except loving sexually the first woman whom he loved in dependent, infantile fashion. This was largely brought about by the universal incest-taboo in the human family that safeguarded the limits of both maternal and conjugal love, and at the same time fostered an emotional climate promoting both affections and security. Without the repugnance and dread of incest that we find in all societies and cultures, sexual jealousy and competition would never have permitted conjugal and maternal love and care of offspring to develop and mature to the human level, and the human family to become the stable and enduring foundation of interpersonal amity and cooperation gradually extending into wider cycles in social development. The discipline of the aggressive life consisted, first, in subduing sexual outbursts within the family so common among the apes; and secondly, in canalising aggressiveness and rage into play, sport and training of the young for masculine cultural skills. It is the mammalian family which man inherited that fashioned human nature, shaping and educating as it did his major drives. So strong and all-pervasive is the process of socialization in the human family that Arthur Keith considers that maternal and conjugal love is an exaggerated form of the social affections. It is from the latter that he considers the former are derived. He gives the evidence that when the sex glands are removed in childhood the social aptitude remains, but the mother's love and the lover's passion are no longer developed. This fact is in favour

of the primacy of social feelings.[1] It is however difficult to accept this interpretation because the entire organic evolution shows the primacy of the sexual and maternal functions.

Roots of Love and Anxiety in the Mammalian Bonds between Child and Mother

Bio-psychologically speaking, the reciprocal emotional attachment between the mother and child at the time of the latter's greatest physiological need, which is so favourable for man's mental evolution, is deeply rooted in the mammalian ties between mother and child. The prolonged breast-feeding of the child and its strong sucking reflex express the symbiosis of mother and child. The same organic inter-individuality is embodied in the heightened (genital) love of the adult man for the woman rooted in life history terms in the heightened oral relationship between mother and child.[2] The child's sucking the mother's breasts is its first step, deeply satisfying both physiologically and emotionally, in the development of interpersonal contacts. The pleasure-giving or rejecting mother becomes the symbol of all future social relationships. Bevan-Brown points out that "it is obvious that a child's mother is, or should be, the first person in the world with whom he associates. She represents the first personal relationship, the first social relationship, the first sensuous relationship; it would be reasonable to assume that this relationship, being the first, sets the pattern of all subsequent relationships".[3] It is significant that neurosis and psycho-somatic disorder often arise due to the early experiences of the child deprived of breast-feeding and the basic emotional satisfaction it implies derived from the pleasures of contact with the mother's body.[4]

The significance of the emotional constellation called the Oedipus Complex by Freud lies in the fear and hostility towards his supposed competitors which a rejected or thwarted child always feels. The Oedipus Complex has many cultural variations, as has been pointed out by Freud's critics. Its psycho-biological roots are embedded in the prolonged dependency of the child upon the parents. Thus the parent's rejection or bafflement of basic desires and activities, both sexual and non-sexual, of the child is accompanied by his anxiety and jealousy directed against one or other parent, who symbolises the irrational authority in the family milieu and engenders in him the sense of guilt. More than the incestuous wish of the child, it is, first, his possessive attachment to the person upon whom he depends for his basic gratification and security and, second, his bafflement in this that explain the universality of the Oedipus Complex and the core of the neurosis. The submission of the child to the dictates of authority

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[1] *A New Theory of Human Evolution*, p. 180.

[2] Flugel, *The Psychoanalytic Study of the Family*, also Wilbur and Muensterberger (Eds.): *Psychoanalysis and Culture : Essays in Honour of Geza Roheim.*

[3] M. Bevan-Brown: *The Sources of Love and Fear*, p. 15.

[4] Harris and others, *The Psychoanalytic Study of the Child*, pp. 9-42.

is, however, easily brought about by the fear of violating the universal taboo against child-mother relationship as well as the happiness derived from social conformity. In infancy both the man and the woman first love the mother dependently (orally). In the process of growth, physical and mental, man who understands feminity through his mother and loves all women as he grows does not love the mother sexually. Due to the universal sex taboo he changes his conception of love from dependency to protection. This is the outcome at once of the early division of labour and the cultural process. Woman, who also first loves her mother in childhood, comes to love both her parents dependently, but can change the sex of her original love-object in order to love all men sexually and dependently. Biologically and psychologically, woman readily extends her all-comprehensive maternal love involving solicitous care, gentleness and devotion to children or to men, and knows more about love than man does. Woman's love is subtler, maturer, more comprehensive and more complex than man's, and reveals the acme of skill, knowledge and tenderness reached by the human species. The anthropologist Ashley Montagu considers that the feminine conception of love shows the highest form of human intelligence, while the masculine idea of love is not very different from that of a gorilla's. Another anthropologist Weston La Barre also agrees with him stressing that there is a psychological mystery in woman's mature love, because some women seem just arbitrarily to love men and it cannot be understood why this should be so in terms of early childhood. The woman who as a child first loved her mother can make the "mysterious" change in the sex of her love-object and come to love her father and hence to be able later to love men.[1]

Consequences of Man Becoming Less Mammalian in his Family

From the biological viewpoint, modern man shows a definite regression from the bio-psychological interdependency of man, woman and child that lies deep-rooted in his mammalian descent and that has been immensely reinforced in his own ancient evolutionary growth. This has shaped human nature and is writ large in the very bodily features of child, man and woman. More than among the primates sexuality and sociability are linked with each other in the human species. The long evolutionary history of mammals, and especially of the social anthropoids and hominids endowed the human parents with hereditary impulses of enduring reciprocal attachment, tenderness and protection and of maternal care of offspring. Constant selection favoured strong and mature mating and philo-progenetive impulses, which extended beyond the individual to their propagation in the community, stock or race and whose efficacy we still discern in all homogeneous rural communities. In the vast heterogeneous bee-hive cities of modern civilization both mating and parental impulses have waned. The instability

[1] *The Human Animal*, pp. 214-216.

of the family as an institution, the break-down of monogamy, the dissociation of sex from reproduction and the loss of that parental solicitude and care for children which near men and their ancestors enjoyed or bestowed are influencing the pattern of genetically determined dispositions as well as sexual selection towards a relative bio-psychological independence of mother, father and child. Both the new highly artificial congested urban environment and the sophisticated, precarious conditions of family life serve as selective forces on larger units and larger periods than the individual and his life. The potential parents of modern cities are less prompted to desire one another, to build a stable home and to nurse and nurture the resulting young than the parents of only two or three generations back. In modern urban communities man is becoming largely polygynous. There is a definite trend towards the loosening of marital bonds and promiscuity that seems to be accepted as an inevitable accompaniment of urban-industrial progress. More and more sex tensions, repressions and conflicts are associated with aggressiveness. In the 20th century the crisis in civilization is connected with the dual expressions of sex and aggression or war and the two are psycho-biologically related to each other. The French sociologist Gabriel Trade reached the same conclusion several decades ago, while speaking of the contemporary exclusive stress of the recreational values of sex and its divorce from life, and cherished the hope that in the future as society develops greater cohesion, the explosive and destructive energy of the predatory human male will be replaced by a sexual pattern fulfilling the highest and noblest responsibilities of life.

In biological terms man is becoming less mammalian than any other mammal. To give an over-all picture of the functional independence that gradually replaces the ancient mammalian symbiosis of mother, child and father in the modern family: the new-born child, bottle-fed rather than breast-fed, and continuously deprived of the warm bodily contacts and affections of the mother becomes frustrated, undomesticated and sick and grows into a neurotic or chronic offender; the mother diminishes her attendance upon the child and chooses a career in industrial establishments, shops and offices with opportunities of extra-marital sexual intercourse; the father decreases his protective attendance of both the mother and child and tends to be polygamous in association with a clientele of maids and woman assistants as his mistresses. The human mammal in a male-centred civilization is losing the innate, organic inter-dependence of child, mother and father and its ancient, deeply rooted socializing milieu of the family which has moulded both human biology and psychology. The interference with the psycho-somatic experience of maternal contact, feeding and tenderness mutilates the child's humanity at the time of his greatest psychological vulnerability. Polygyny and birth-control in alliance with each other introduce new conceptions of sex, marriage and family

that extravagantly stress the recreational aspects of sex dissociated from the immensely ancient claims of parenthood and stability of the family. Even the human female, superior to the male in her psychological understanding of the modes and the means of love and its fulfilment, has lowered the standards of sex. Artificial insemination has been introduced, and led to the production of offspring of test-tubes from donors. Such test-tube offspring has been declared illegitimate in the U.S.A, and legitimate in the U.K., even if the father is unknown and the husband's consent is not obtained. The relations between the husband and wife and between mother and child may be altogether transformed and the family may disintegrate further if science makes artificial insemination easier and more widespread, and thousands of babies come to be procreated outside any social, legal or religious sanction and only by the will and consent of medical men. It is estimated that in the U.K. 10,000 "test-tube babies" were born in the past thirteen years. The age of mechanization and disregard of organic processes may also some day discover an apparatus of stereotyped and effortless mechanical orgasm that may abolish the rhythm of bodily contacts and the ebb and flow of human affections.

Man, the Polygynous and Pugnacious Mammal

Man is ending by becoming polygynous, hyper-sexual and hyper-aggressive in his family life unlike the social anthropoids. He is dissipating the mammalian gifts of the psycho-biological interdependency of woman, child and man, and becoming a foot-loose sex adventurer and renegade. It was the deeply-rooted mammalian family which civilized the ego-centric sex drive and was the vehicle of education and transmission of Homo's sociability, tenderness, love and altruism. As Homo became an enterprising migrant and pioneer in new lands and an adventurous nomadic warrior early in his life-history, the solidarity of his family received a set-back, although migrations and wars were indirectly responsible for the enrichment of his genetic and social inheritance. More than any other animal the human mammal shows greater variability of types. This is connected with his stronger migratory habits and greater range of wanderings than any other animal species. His wanderings are largely due to his biological capacity for acclimatization and control over the environment through his social organisation and repertory of speech and artificial tools. Yet in spite of man's divergent evolution producing the very different major black, yellow, white and other sub-species he has remained a single species. There are important social consequences of his variability and migration that are linked with each other, and that are also coupled with man remaining a single biological species without sub-division.

First, man has shown more inter-breeding or crossing than most animals without becoming infertile. This is largely responsible for the variety of human cultures in man's history. Such variety is of course the final out-

come of the change in the dimension of human adaptation from the biological to the mental and cultural level. As a matter of fact the universal incest-taboo in the human family which enforced exogamy was an important factor in the prevention of the evolution of Homo into several separate species on the one hand and the diffusion of language and culture on the other. Very early in the evolution of man a cultural factor intervened that promoted the "polytypicality" of the human species and the development of a common inheritance for different human cultures.

Secondly, man's migratory habits coupled with the possibilities of admixture between distinct types with their social consequences in respect of slavery, miscegenation and extermination has promoted chronic conflicts and internecine wars which have become normal and are of major importance only in his case. There are no animals that show so much interspecies conflicts culminating in the extermination of distinct types. Even today the fate of *Homo sapiens* is hanging in the balance due to the possibility of wars on a global scale with the use of atomic weapons.

Thirdly, because of the fact that the human animal has obtained and maintained his ascendency without splitting, he has also been able to develop a single global human civilization. Many social insects have evolved a more perfect and well-knit social organisation and have shown greater social cohesion. Their patterns of life show a greater responsiveness to the limits and possibilities of their ecological and biological environment but are rigidly circumscribed within their different sub-types. Neither ants, nor bees, nor wasps, though they accumulate and transmit an external social heritage, have been able to create a single global insect tradition. Some biologists consider that the biological evolution of man will be retarded due to the human species rapidly becoming through more or less even admixture a huge, undivided population.[1] But the handicaps due to "genetic *laissez faire*" in a vast homogeneous intermixing type are far outweighed by the social advantages which are more to be reckoned with for man's fresh evolutionary advance. Besides any possible biological drawbacks arising from the obliteration of peculiar local types or combinations of types suited to different biological experiments may be counteracted by measures involving some artificial influencing of human selection.

It is because man is unique in comprising a single biological species and at the same time is divided into diverse sub-types, it is his evolutionary destiny to achieve and maintain one common human civilization on the earth. Representing as he does the acme of organic evolution that has proceeded for more than a thousand million years, it is his prerogative to build up consciously and deliberately a common social heritage that can embrace the earth. The heritage is the experience of love, beauty and goodness and enhancement of human standards of common living that can

[1] H.J. Muller: Man's Place in Living Nature, *The Scientific Monthly*, May 1957.

unite entire humanity in spite of the set-backs of war and hostilities. To the extent that man fails to develop a common world tradition he falls below his mammalian dispensation. The failure of the pugnacious and aggressive human animal to do so is largely connected with his failure to maintain the mammalian interdependency of woman, child and man in the biological family. The rage and aggression impulses and phantasies of the disorganised family and inter-personal relations are some of the root-causes of inter-group conflicts, revolutions and wars.

On the other hand, the extension of the ranges of man's altruism and compassion, his emotions and sentiments of identity with fellowmen in ever enlarging ambits, spring from sexual love, affection and tenderness in the family. Brains, affections and infantile dependence comprise the essence of humanness. All that distinguishes man from the animal in evolution has developed within the family, and man should safeguard rather than fritter away this legacy. It is the family that transforms the explosive mammalian sex impulse into gentle, self-oblivious inter-personal affection and tenderness. The tender and subtle nuances of sexual play and dramatisation in the family setting raise man's sexual selection to the higher plane of unison of emotion, sentiment and behaviour. His basic aptitudes and capacities of repression, sublimation and symbolisation, facilitated by learning and tradition, transform the polymorphous animal endowment into an ever differentiated richer, and deeper pattern of love, that due to the relative freedom from inherited patterns not only becomes different for each man and woman but also becomes a comprehensive compassion and altruism. As a result of sexual education, discipline and symbolisation, frustration and privation do not necessarily result in mental distress but rather redirect love to the larger kinship group, to the community, to mankind at large. Mankind must restore affection, compassion and tenderness in the family and abolish its primitive despotisms, hates and fears before it can expect the ideal and organisation of mankind-as-a whole to appeal effectively to the moral sense of the individual. With the unconscious motivations of hates and jealousies in the family group, the ideal of the brotherhood of mankind can never secure his allegiance, but can provoke his hostility or may be utilised by incurable authoritarians for aggression against the individual and for threatening the solidarity and security of the race.

Human Dissipation of the Acquisitions of the Mammalian Family

Man's nearest relatives, the chimpanzees, as found by Yerkes, Crawford, Kohler, Nissen and Maslow, are among the most peaceful, affectionate, unaggressive and altruistic of animals. Nissen gives a vivid account of a large chimpanzee male rushing directly towards him in the bush without any sign of fear and "saving" a youngster from an imagined attack. Yerkes, who quotes this, remarks that the chimpanzee's solicitude is exhibited also

by various monkeys. "It has repeatedly been observed and recorded. One might define it as group response to a vocalisation whose meaning appears to be danger, help ! The instant the cry is uttered by an individual, its companions almost as one rush to its assistance. Their united attack on an intruder may be both precipitant and violent."[1] Kohler delineates the poignant sympathy of a whole group of chimpanzees towards a sick comrade and their joining together in a demonstration of protest as the experimenter imposes severe discipline on one of them. Sympathy, tenderness and altruism are characteristic not merely of the great anthropoid apes. The Rhesus monkey parents in India show altruism to the extent of sacrificing their lives in defending the offspring against the attacks of human hunters and captors. The Diana monkey mother is known to sacrifice herself to save the lives of her offspring against the carnivores in the tree-tops, the young ones being passed on to a neighbour monkey who runs away to safety with them.

Man is dissipating his mammalian inheritance of maternal love, tenderness and sacrifice characteristic of the great apes and many species of monkeys. Human nature is the product of evolutionary history, covering thousands of million of years, and was subsequently modified during man's arboreal apprenticeship. Having emerged from ape-dom man is losing the tenderness and lovingness, characteristic of the family life of mammals, and especially primates, and endangering his security. Clarence Day, comparing *Homo sapiens* with his fore-runners points out that "primate nature" constitutes the most considerable element of human nature.[2] Man's ancestors first became brachiating arboreal creatures and then descended from the trees 10 to 20 millions years ago. *Homo sapiens* emerged on the grass lands from this group much later—only 50,000 to 100,000 years ago—a very short period in the evolutionary scale. Much that is attributed to the development of human intelligence, reason and empathy or self-transcendence rests on family-oriented sociability and interdependence of mother, child and father, constituting the core of mammal and primate character, now being almost universally corroded. Psycho-biologically speaking, *Homo sapiens* is the family. His evolutionary progress rests on the biological continuity of the family and the social continuity of its goals, values and satisfactions that far transcend the overt economic, social and emotional interchange within it. To squander the birth-right of the family rather than to cherish, elevate and refine it is to tread on the wrong and dangerous track of human regression. *Homo sapiens* is now unwisely changing his dispositions, goals and patterns of behaviour in a direction not adapted for his successful living, and may perish just as many reptiles perished and for

[1] Yerkes and Yerkes : Social Behaviour in Infra-human Primates, *Handbook of Social Psychology*, pp. 10-23.
[2] *This Simian World.*

the same reason viz. loss of parental care and solicitude in the family.

It is clear enough that a refined and elevated family life, originally and psychologically rooted in the primate interdependency of man, woman and child, is linked with human stability and survival. The *Tyrannosaurus rex* had been the most mighty, stupendous and terrible predaceous animal that ever dominated the terrestrial scene. It was the most superbly equipped and successful vertebrate, well-adapted to the conditions of its existence in the Cretaceous Age. One of the causes of the extinction of this species is that it left its huge eggs unguarded and uncared for, and could not establish the family that largely explains the ascendency of the new succeeding race of mammals. But it lived and thrived for at least a hundred million years, while *Homo sapiens* has ruled the earth for only one hundred thousand years. The lapse of the cooperative, tender and altruistic attributes of the mammalian family may spell man's doom. *Homo sapiens* must be a loving, tender and devoted family-man in order to survive.

CHAPTER VII

INSTINCT AND INTELLIGENCE IN HUMAN SOCIAL EVOLUTION

The Stages of Evolution of Sociality

Society existed long before man emerged on the scene of the earth. Many social strands go back to organic evolution both in the plant and animal tracks. Organic evolution in its upper reach merges into and is succeeded by social or conscious evolution. According to J.B.S. Haldane the course of evolution has generally been downwards. The majority of species have degenerated and become extinct, or, what is perhaps worse, gradually lost many of their functions.[1] Julian Huxley also observes that there are grounds for suspecting that biological evolution has come to an end so far as any sort of major advance is concerned. He considers that "it is only through social or conscious evolution that the world-stuff can now realise radically new possibilities."[2]

Ecological communities like species of grasses and forest plants, fungi and bacteria, sea-pens, reef corals and sponges show physical contact which is the basis of aggregation. But this is purely a physio-chemical or climatic phenomenon, giving rise to vegetative societies. The biological advantages of proto-taxis, automatic mutualism or unconscious association are that they help to protect the organisms from damage from ultra-violet radiation and other environmental pressures, and from wounds. All living organisms show an innate trend towards aggregation reaching an optimum population size.

There are certain creatures like mites in a rotten egg, insects around a lamp, rabbits in a warren and parrots in a flock which live a gregarious life but are hardly social. They have developed neither any sense of co-operation nor division of labour. Gregariousness and social life and organisation should be distinguished in the behaviour and evolution of animal societies. Antelopes and wild horses are more social than prairie dogs, and a pack of wolves shows more concerted action than a herd of antelopes and horses. On the whole, as is expected, the more intelligent creatures viz. birds and mammals show social awareness, impulse and integration.

The second stage of development is that of acquisition of a sense of division of labour and cooperation not only in attack and defence but also in other collective activities, such as food-quest, flight and expedition.

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[1] *Possible Worlds*, pp. 303-305.
[2] *Evolution and Ethics*, pp. 122-123.

This is exemplified by birds and herbivorous and carnivorous mammals. Pelicans show a marvellous device of cooperative fishing as they advance, wading across a lake in a semi-circle and closing gradually upon the fishes. Rooks also exhibit a lively sense of cooperation as half a dozen of them stealthily lift with their beaks a half-empty pot of rice from the household and remove it to a safe distance for a noisy, collective dinner. Lions are solitary carnivores. But in Kenya they have, due to reduced supply of game, developed the habit of hunting in a pack with a regular division of labour. The pack spreads out in an enclosing movement in the forest and closes in roaring; while one lion lies quietly in ambush waiting to attack the game as it is driven in.[1] Many species of apes show combination not merely in attack and defence but also in plundering orchards, crossing over streams and nesting in parcels of forests. Migratory birds from the northern climates owe their success in their long flights across continents to their wedge formation which lessens exertion, and develops the responsibility of guidance on the leader who can be changed when the bird gets tired. The most elaborate division of labour is, however, seen among the social insects like ants, bees, wasps and termites. Here the division of labour is due to physiological specialisation which has led to the formation of castes of queens, drones, soldiers and workers. The high degree of social integration based on physiological polymorphism discernible among "sanguinary" ants enables them to undertake long-drawn out inter-species expeditions and wars with almost human preparedness and tactical ability. "We laugh at the ants—the laugh comes back on ourselves."

The third stage of development of sociality hints at the emergence of the social tissues of leadership and subordination, discipline and obedience. Herds of elephants, deer and bisons and troops of apes and monkeys have their scouts, sentinels and leaders, and patterns of hierarchical organisation and social control and participation in various degrees of strength and flexibility have developed among them.

The fourth stage of development of sociality among the animals is that of the evolution and transmission of a legacy of permanent, objective social products such as territory and traditions. For example, the social insects live a community life in their hives and nests, the beavers in their canals and ponds, and the social anthropoids in their forest territories. The young animals in each case have a basis on which to work—an external registration of species gains. The permanent social products of animals as represented by the communal nest, shelter, store, camp or territory must be regarded as the beginning of social inheritance which has meant so much for man's evolution. Elaborate traditions of cooperation centred round the dwelling and foraging territory bind the welfare of one genera-

[1] Linton, *The Study of Man*, p. 78.

tion with that of another and assure the continuity of development of the species.

Finally, the highest degree of sociality is associated only with certain species of animals which exhibit considerable sociability, sympathy and like-mindedness enabling mental and moral qualities to be selected, developed and transmitted to an extent not discernible in other social animals. These animals are, on the whole, more intelligent and have developed a considerable degree of intricacy of the brain and nervous system. Among them there is a conscious beginning of self-subordination and collective discipline as well as learning of behaviour. Plays and sports serve an important role in inculcating like-mindedness and unison, and fostering habits of social action, loyalties and sympathies among the young. The social and biological value of play among many social animals can hardly be over-estimated. These vary from the drilling manoeuvres of penguins and the choruses of some song-birds to the sports and expeditions of monkeys and the active nursery games of lions and tigers. All kinds of animal games favour sociability, instil in the offspring habits of concerted action and discipline them for their social ways of living.

The Role of Kin-signals in Animal Society

The most intelligent among the social animals develop not only collective games but also intricate socially imitated signalling reflexes or organic kin-signals. Smell, touch and voice are used in animal kingdom in divergent manner as means of social signalling and communication. Bees get news from one another by smell. Dancing is also a method by which worker and scout bees communicate news to the hive. Their round and wagging (or figure of eight) dances convey different information to the hive mostly in respect of the direction and distance of food supply. According to von Frisch, "the sweeter the newly discovered food the livelier is the dance; the closer it is the more propaganda is made for it."[1] Ants also communicate through smell and touch. The most important phase of evolution of the kin-signal is however the differentiation of sounds according to various biologic needs. We find the use of voice as a sex-call in most animals from the croaking frogs to the singing birds. We find also among many animals the parent calls to the young ones, as when patridges utter their danger cry that makes their offspring squeal and lie still or the young ones call their parents as in the case of the unhatched crocodile piping from the egg-shell. Many gregarious animals produce sounds in common due to imitation, rivalry in the case of males and the expression of greeting. An ass or pariah dog causes all the asses or dogs in the village to bray and bark. Bats call each other in passing. The roar of a lion causes other lions near by to join in the roaring, often having

[1] *The Dancing Bees.*

no meaning. The howl of monkeys sometimes causes a whole neighbourhood resound in a chorus of challenge, laughter or indignation.

Kin-signals become "symbols" when these do not serve any immediate adaptive requirements. There are no selective reasons for the deployment and manipulation of patterns of abstract "symbols" that comprise a late development from the inherited voice and behaviour patterns of animals and are elaborated in the complex processes of learning behaviour.[1] The uses of kin-signals by animals for defence and attack or in the course of hunting, foraging and migration, and again when these are associated with sex, pain, rage and fear are mostly biological, non-symbolic. An isolated monkey attacked by an eagle may summon its kindred by its moans and entirely alter the crisis. Many small gregarious birds make the hawk's expedition futile by uttering a danger cry. Many birds and mammals, however, make gestures, cries or noises as they play and dance, irrespective of organic needs and contingencies of the biological situation. L. L. Whyte suggests that an unknown Homo who played with organic signals, i.e. used them apart from the corresponding biological situations took the first step in the discovery of language. From the non-adaptive surplus experiments as a kind of symbolic play man's language emerges.[2]

The recent works of von Frisch and Lindaur have shown that bees effect communication by dancing. A part of the interpretation of the performance of their round or figure-of eight dances depends upon the complex inborn behaviour pattern. All young bees, however, must go through a learning process within the hive, so as to properly understand and interpret the relation between dance and "the position of the food source." Scout bees exhibit different kinds of dances, so as to indicate the 'quality' of a new site for swarming, viz., its direction, distance and suitability. von Frisch observes: "The 'language' of the bees is not a verbal one, and its means of expression is not the tongue but the senses of touch and smell. The bees' 'words' are rhythmic movements and scents. The mental principles of communication between bees are quite different from those of the human language. They differ however also from the means of communication between other animals. The calls with which one bird warns or attracts another, or its mating song express only the animal's motivation, which can convey itself to other members of the species. The 'language' of bees, however, transmits the knowledge of "significant facts." Bees use a real 'concept' as they tell completely and accurately by their dances the direction of the feeding place with reference to the sun and its movement in the sky. They have developed what is called "propositional"

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[1] Thorpe: *Learning and Instinct in Animals*. See also Harlow: The Evolution of Learning in Roe and Simpson (Ed.): *Behaviour and Evolution*.

[2] Whyte: *Accent on Form*, pp. 162-163.

language which until recently was considered as the sole monopoly of man.[1] Similarly the notes of birds are usually inborn and fixed, but many songbirds have been observed to "learn" the fine detail, pitch and rhythm of the notes. While in a flock many gregarious birds build up through reciprocal stimulation and imitation a distinct community pattern of chatter that serves as a signal for birds even of different species to forgather. During spring when birds compete with other birds of the same species for nesting and foraging territory, they imitate the notes of experienced older birds or improvise new notes. Many birds are observed to follow their parents or models and adjust themselves spatially by obtaining guidance from the variegated cries or signals of the latter. Some birds are also known to "count" up to seven. Several ornithologists suggest that in the finer details of the elaborate songs of birds we discern the beginning of both true artistic creation and language.

Modern studies in instinctive behaviour and the percepient learning of animals show that their thought processes are far less dissimilar to man's than was once considered.[2] Man's speech is preceded in natural history by the vocal improvisation and imitation of many other animals. These have survival values and also turn out to be their own rewards, i.e. are "symbolic"—instances of "pre-adaptation" to apparently unknown biological situations and not of adaptation to immediate organic needs. In animal evolution instinct and intelligence, the more or less inborn equipment and the learning ability, intermesh. We cannot therefore discern where animal communication becomes "symbolic" and consciously intentional and transmitted as a "tradition" and a "value," developing complexity by elaborate learning processes and by pre-adaptive and non-adaptive surplus experiments that comprise the emerging symbolic play. Hardly can biologists attribute any selective reason for the extreme tonal purity, invention and elaboration of some bird notes and songs that are akin accordingly to symbolic sounds at the human level. Where does this symbolic play of vocalisation emerge? Even for the human species the first words and phrases appear to have fulfilled immediate biological goals and purposes to be transcended later by symbolic functions.

The Discovery of Human Speech

The genesis of human speech is not easy to discover. Man experimented with gesturing with the tongue along with gesturing with the hands, as he gave expression to his emotions. This led to the discovery of words in which lips, tongue and facial and manual gestures are simultaneously employed. It is a small area of the human brain in the front portion of the cortex that transforms the yelp, squeal, squall, howling or bellowing of apes

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[1] von Frisch: *Bees, Their Vision, Chemical Senses and Language* and *The Dancing Bees*.

[2] Hinde and Tinbergen: The Comparative Study of Species-Specific Behavior in Roe and Simpson (Ed.): *Behaviour and Evolution*.

into articulation for words. Words are heard as well as seen, and cannot be dissociated from social situations which elicit them from the very beginning. The vocal noises and facial expressions of early humans gathered precise, meaningful association in the intimate, emotional interplay within the family or any other face-to-face group where these could be easily read and understood. To follow and interpret them quickly, to be able to communicate and hence to cooperate, enabled human groups to survive and carry on the race. Words that are tools of the voice once standardised spread like the tools of the hands. With the use of words, man's mind, behaviour and values attained new dimensions of evolution.

What were the unknown Homo's first words ? Were these of love, danger, command, rage and admonition, or of exuberance of spirits, euphoria, laughter, sport and sheer joy of social communication? Several hypotheses of the beginnings of true speech hold the field. We may as well advance another hypothesis. Early man was not solitary but gregarious, not helpless and passive but courageous and adventurous. He neither ranged over the grass-land silently and stealthily like the great cats and dire-wolves, nor could run fast to escape danger like the antelopes and horses in the open. Most of human words at the beginning must have expressed in some manner feelings at critical situations. Each half-articulated cry or exclamation conveyed a strong emotion at the moment and was as eloquent as the facial and manual gesture. A social predicament or crisis evoked such vocalisation that was shaped into speech by the human brain, and its obvious uses were social—whether hunt, chase and flight, or work, play and merriment in association. Many words must have emerged together according to the diverse emotions and situations which early man with his loose tongue encountered in the grass-lands. Unknown Homos perhaps discovered and spoke the first words or phrases on crucial occasions and for immediate, adaptive group requirements such as the following: alarm signals and cries for help during attack and defence, or when a Homo group lost its way in the maze of the forest; agonising or jubilant yells before or after a hazardous expedition, fight or economic enterprise; and sing-song syllables during strenuous collective toil like log-rolling, expedition like hunting and fishing, and excited movement and dance like those round a captive female or a dead chief. Or the first words may have been Homo's choral shouts of relief, joy and exaltation in games, feasts and corroborees.

From cries, gestures and movements with their meanings fitted into the different situations—non-adaptive, symbolic experiments which now comprise the major part of human speech—there also evolved the magical drawings of the chase. As early man hunted and trapped wild animals of the grass-land and forest, he also created a magic of the chase, an unreal chimerical world led by the magic men or sorcerors, who were capable of

dominating and directing the horde. Without the magic man's intervention, the horde would split up in epidemic fear and stampede. Hunt and magic were depicted in the pre-historic paintings in French caverns, and the yells and hullabaloos of the chase were some of mankind's earliest vocalisations. Early hunters indelibly impressed the memories and reveries of their hunts and expeditions on the first art products, the paintings and drawings on the dark walls of caverns, where they sought shelter from the weather and the beast, and feasted and enjoyed themselves after a successful animal drive. Love and solicitude, happiness and misery, surprise and release from tension and anxiety and mere physical delight and exhilaration, in which the group participated, all found expression in early man's word or phrase that was remembered and became the property of the group, the human pair, the mother and her children, the leader and his horde. The mothers' babbling and chattering to their babies must have invented many words expressive of maternal tenderness, love and devotion. The sturdy, rough fathers coming back to the cave and sitting around the fire adopted them as expressions of generalised feelings. Similarly arduous toil and drudgery in team work in the forests were relieved by early man's rhythmical bodily movements, gestures and choral sounds that also were linked with useful mental sets, goals and activities. These had their survival values in man's evolutionary history.

The Role of Words and Phrases in the Family and the Hunting Pack

It is a social rather than an individual crisis that obviously is the mother of the invention of the word or phrase aiding human struggle and survival. Man is not a solitary animal, living in isolation like a wolf, tiger or kite. We can well imagine how as soon as he completed his arboreal apprenticeship, descended from the trees into the open plains and roved or hunted in a small isolated band comprising the male leader with a few female and young ones, group crises were more significant for human survival than the crises of personal life, connected with the individual's sexual excitement, tenderness, anger, fear and aggression. For the survival of the species the individual obviously is of minor significance. Noises and gestures became words or linguistic symbols as in the initial social situation these elicited similar mental sets and behaviour from a number of individuals, and had the same adaptive "meaning" for all.

Cooperation within the family and the hunting pack was the key to human survival in the grass-lands. This rested on effective communication whether it is a gesture, a signal from the facial expression or a sudden scream, warning and call. The effectiveness of communication of feeling, intention and goal of action decided whether the group and the individuals will eat or will be eaten, will live or die. Speech first developed in the setting of the cooperative hunting group gradually achieving larger and more

effective size in man's struggle for living in the open territory, where the words had to be projected over distances. The empathy of the familial and the hunting group that standardised the voice, sounds and gestures and fitted their meanings to different social situations was the cradle of words and phrases. The communicative group safeguarded the survival of the individual and also provided the training of the young with speech or language as the basis of continuity of traditions and values.

Genetically speaking, the primary quality and role of speech are biological-affective, developed from the cries of defence, attack, flight or movement of the gregarious mammals that arouse adaptive emotional responses and social behaviour in the pack, troop or colony. Gradually language is evolved by which we mean speech and sounds associated with particular objects and situations as well as with concepts and values looking back to the past and forward to the future. Language is oriented towards remote objects and goals and unlikely situations transcending biological needs and functions. In the human vocabulary there are abstract symbols that arise with reference to man's capacity for abstract reasoning and appreciation and achievement of abstract values. It is, therefore, pertinent to distinguish between organic words and phrases that serve a biological function in terms of immediate or somewhat remote contingencies of life, and non-organic and symbolic words and phrases that emerge in the context of man's abstract reasoning and pursuit of abstract values. Man obtains a new kind of joy and self-competence through his use of words, phrases, rhymes and songs for expressing abstract ideas and values—such as life, death and destiny, truth, beauty and goodness. These become reinforced and all the more satisfying as many men can hear these. Happiness, self-esteem and pride, self-actualisation, creativeness and transcendence, all blend in the deployment of abstract language. Correspondingly, there are striking changes produced in the cortex. The human brain is much larger and more complex and plastic than the brain of any apes and earlier types of hominids. Its distinctive area lies in front of the central groove and the cortex which is associated with conceptual thinking, memory, imagination and orientation for future action based on generalisation of ideas, values and experiences.

Animal and Human Vocalisation

Animal speech at its best is to be found among the great apes which have a large vocabulary. Chimpanzees in the forest have been known to express strong feelings of grief or indignation by sounds which being imitated and echoed resound in the entire jungle. Language, like the rudiments of culture in general, has no doubt pre-human beginnings but true language is the unique possession of man. It expresses abstract concepts and enables him to manipulate his ideas, emotions and experiences intellectually

without being bounded by time and space. Animal noises and gestures occur in relations mainly, if not exclusively, to stimuli in the immediate external or internal environment. These are largely passive. Animals have hardly developed articulate sounds as a means of control of the environment and of the behaviour of other animals. For these have no abstract or symbolic meaning nor refer to the past or the future. Such deficiency imposes two limitations of the utmost importance in social evolution. First, communication, social intercourse and cooperation become radically limited in range and depth. Secondly, the development of symbols, traditions and values is curtailed within extremely narrow bounds. Animal vocalisations cannot generalise nor can these have any abstract or symbolical meaning, and value attributes. Not even the great apes have the capacity for abstraction, generalisation and thinking in terms of sounds used as symbols. Since animal speech cannot describe what has happened in the past or is likely to happen in the future, it cannot promote learned behaviour except to a slight degree, nor facilitate cooperation in communal undertaking for remote goals and purposes to the extent that human language ensures. Language requires an elaborate association mechanism to link sound symbols and other signs with intelligent percepts and concepts. In man this involves cortical enlargement as well as different parts of the brain. No such association mechanism seems to exist in the brains of even the great apes. Man's phenomenal expansion of the neo-cortex with its extremely complex and refined archipallial structures and mechanisms is responsible for his verbal or symbolic capacity.

The Role of Language in Man's Evolution

From the moment that man began to express conceptual thought and tradition in language, however feebly, however awkwardly, he began to develop a human nature. On the one hand, society favoured the evolution of communion from communication. On the other hand, language developed "consciousness of kind" and set its seal on the tenderest and deepest social feelings and emotions. Language is an instrument of thought, valuation and social action. It serves as a cohesive force uniting human groups and setting them apart from others. The possession of a common language is an index of the social solidarity of the group. Thus language underlies the evolution and elaboration of tools, territory and traditions, especially symbolic and intellectual traditions which become the most powerful social binders and make one generation solidare with another. Intellectual traditions, as these transmit ideas, beliefs and experiences from one generation to another, greatly facilitate individual learning as well as exploration and discovery in new social situations. As Bernhard Rensch observes, the unique development of human mind is no longer founded on mutation and selection, but on the non-inherited transmission of experience through tradition. "The development of writing and printing permitted

this development of tradition forming to be raised to a higher level than single brains can achieve by individual learning. Through books, extra-cerebral chains of associations were created, with which the human brain can establish connection at any time, and with the aid of which it can achieve super-individual effects."[1]

Above all, it is language which gradually builds up the morality of man who alone among the animal species is subject to chronic mental stresses and conflicts. Through his capacity of expressing value quality and value judgment on the patterns of his behaviour and experience that comprise alternatives he becomes moral. But morality is only a part of man's value feeling and experience. As an evaluating, appreciative, communicating creature, he now comes to consciously direct his own evolution by his norms and standards of truth, beauty and goodness.

Birds and mammals show the rudiments of this value consciousness and experience. Birds adopt a rigid nest or territory system, the trespassing of which is attended with certain patterns of behaviour indicating almost a human sense of guilt. Such "a sense of guilt" is also shown by the social anthropoids caught by the leader of the troop in acts of encroachment upon his sexual rights. The entire scheme of serial subordination and domination of several species of anthropoids rests upon the recognition and discrimination of the "values" of relationship of subservience and dominance. Similarly these animals show evidences of recognition and appropriation of "economic values" embodied in food objects. Chimpanzees in captivity are seen to collect all kinds of objects, especially attractive ones, which they carry about with them in their arm-pits. Here is an evidence of recognition of "aesthetic values." The acquisition of territory for foraging and nesting and defence of a food object, a nest or a territory as well as the enforcement of dominance behaviour are accompanied by attitudes and patterns of behaviour that show rudiments of conscious value experiences with their multitudes of variations and shadings. The educability of the great apes has been scientifically demonstrated. The ape mother teaches her child many life habits both by punishing it with bite and slap, and rewarding it with food and caress as the situation demands. Yerkes describes ourang and chimpanzee mothers systematically exercising and training their infants and restraining them from doing certain things until they have reached a definite stage of development, and then encouraging and aiding to do them. Carpenter also observes that howling monkeys seem to make use of certain noises as meaningful ones in certain situations. Adult males interfere by a kind of growl when they notice that the young monkeys become too wild in their fighting play, whereupon they immediately stop it.[2] Many interesting experiments have

[1] Evolution of Central Nervous Functions in Huxley and others (Ed.): *Evolution as a Process*, p. 198.

[2] *Comparative Psychology Monograph*, vol. X., 1934.

been carried out for the study of conflicts of the "values" of obedience, hunger and sex, among the great apes and the genesis of their psychoneuroses. It is the inadequate mental development and the absence of language which shut out true value meaning and judgment on their part.

Man's capacity for value experience and judgment has evolved from the animal level and is embedded in, and dependent upon, an interlocking net-work of his other capacities in which also he is unique: his use of language, conceptual thought and symbolisation rooted in his progressive cerebralization; his use of tools, territory and traditions; his capacity to inquire and manipulate ideas intellectually; and finally his awareness of self-actualisation or growth. The term self-actualisation is used by Kurt Goldstein, Rogers and Maslow and means man's tendency "to become everything that he is capable of becoming." Cantril calls this the outstanding characteristic of man—his capacity to sense value attributes and emergent values in all situations, activities and experiences. No doubt man's emergent values of life are characterised by their uniqueness and their immediacy. Yet these are shared in common with other men and are relatively expansive and transcendent. As he experiences values and makes value judgments quickly, largely unconsciously, his intelligence is released to deal with the larger range and greater complexity of his environment in his evolutionary development. Thus what are social products—beliefs, goals and values —guide man's selection and survival.

Man's Mental Development Lop-sided

It is only the intelligent animals which with the increasing development of sense organs have also evolved the cerebral cortex that can in some measure experience and transmit values and develop and refine social and moral tissues. The cerebral cortex is the seat of the symbolic activity of man without which neither his intellectual nor his moral and social advancement is possible.

Some years back Morley Roberts suggested that the enlargement of the human brain has gone so fast and so far that the result is actually pathological. It is a sort of "tumourous overgrowth" of the human cortex with its functions out of normal control that is responsible for world-wide exploitation, conflict and war. William James also observed long ago that much human failure is due to the fact that most people do not use half the brain power with which they are endowed. Herrick quoting him remarks: "There is plenty of mechanism available and vast reserves that are never drawn upon except perhaps in explosive emotional outbursts without rational control."[1] A comparative study of brains from the lower vertebrates to man shows on the whole that the marked characteristic is progressive cerebralization i.e. increase in the quantity and complexity of

[1] *The Evolution of Human Nature*, p. 398.

the fore-brain. Man's mental advance remains lop-sided. There is an exaggerated development of the cortex containing some ten billion neurons responsible for his striking intellectual progress and relatively inadequate progress on his instinctive and affective side that might have induced corresponding improvement of his relations to fellow-man. The biologist Bertalanffy has recently stressed that due to this discrepancy not much development is seen on man's moral side since the emergence of the Neanderthaler. He observes, "If moral progress is possible, it seems so only in the way of inhibition and sublimation. The inhibitory action of higher centres on lower ones is a well-known fact in neuro-physiology. It appears that we cannot change the *bete humaine*: we can only hope that the brute in man is better controlled."[1]

Sociality Rooted in Family versus Open Aggregation

It appears that the methods of evolution of sociality have been differentiated among the higher forms of animal life. Among birds, for instance, flocks usually arise more from the aggregation of individuals even of different species than from the fusion of mated pairs or families. On the other hand, among the social insects, higher apes and men, societies rest on the aggregation of family units. The ant society evolved from the family system of the non-social wasps, and the termite society evolved from the family system of the non-social cockroaches.[2] Insect societies are single families writ large, while Yerkes points out that gregariousness and degree of dependence of the individual on the group tend from lemur to man to diminish and at the same time to give place to a more definite and stable social unit, the family. The highest social solidarity and sacrifice of the individual for the common good seem to characterise animal societies integrated out of stable family associations. This points to a significant biological role of the family which human social evolution cannot outgrow. Even in bird life the territory system as well as display of noble parental devotion and sacrifice, which indicate distinct social advances, are associated with the short-lived familial existence, soon to be superseded by open congregations formed by individual birds even from different quarters and flocks. Both among birds and social insects the family is closed. But in the bands or troops of social apes and monkeys and in the human social organization, the family is open, and there are retained primitive aggregative or associative tendencies which, in the words of Wheeler, "hark back to the ancestral fish and tadpole stages." The most stable forms of social life appear to emerge when ecologic, sexual and familial integration has combined together along with the capacity for sympathy and subtle reciprocal response. The social result is a rapid increase of numbers in the

[1] *The Scientific Monthly*, vol. 82, 1956, p. 37.
[2] Emerson: Dynamic Homeostasis, *The Scientific Monthly*, Vol. 78, p. 80.

herd, colony or association, which cumulatively increase the efficiency of obtaining food, establishes a high degree of division of labour and permits tentative new departures to meet environing limitations which the solitary animals could never risk.

Human and Insect Societies

There are profound differences between human and insect societies. First, human societies are open while insect societies are closed. The former are heterogeneous and show far greater genetic recombinations and more numerous mutations yielding a vast variety of genotypes that are tried out in the more complex human environments. Secondly, while human societies like insect societies are rooted in the family, man's behaviour and goals have far transcended the levels of sexual and familial integration as among the primates. Thirdly, the division of labour, social integration and directional evolution in insect societies are largely the outcome of physiological specialization that is modified by ecological factors. In human societies these are largely the outcome of symbolic communication and learned behaviour or culture. Fourthly, the social behaviour of man depends far more on his intelligence, educability and culture and far less on instinctive equipment as in the case of the social insect. The latter depends more or less exclusively on its repertory of a few, sharply differentiated instincts. That is why little or no development has taken place in the social life of insects. Man is more plastic and adaptable. His instinctive endowment is less specialised, and his social life therefore has shown variety and complexity as well as inefficiency and set-back, not discernible in the insect level.

Insect societies in their specialisation and coordination of the behaviour of individuals and castes in the interests of the colony as a whole show the biological triumph of instinct in social evolution. In the world today ants are more numerous than all other terrestrial animals in the aggregate. There are 3500 species of ants adapted to the most varied ecologic conditions of the environment. The enormous ant colonies of the tropical rain forests exhibit patterns of coordinated and regimented behaviour that far transcend any human totalitarian visions. Their enormous nests show an amazing intricacy of physical structure that can only be maintained by the rigid conformity of each caste to hereditarily determined stereotyped patterns of reflexes and instinctive activities. Schneirla and Piel describe an ant nest as "a seething cylindrical cluster, ant hooked to ant, with queen and brood sequestered in a labyrinth of corridors and chambers within the ant mass." Ants are the earth's oldest cosmopolitans and builders of metropolises in which their control of temperature, defence and storage and distribution of food approximate to human conditions.

Divergence in Principles of Genetic Development

H. J. Muller dealing with the extra-ordinary development of social

behaviour among the ants, bees and termites formulates certain genetic principles. Ordinarily the social traits evolve as the result of inter-group competition and this takes a much larger time as compared with the evolution of individually useful traits. The former pass through the sieve of inter-group competition, while the latter become selected both by inter-group and inter-individual competition. The social insects, however, comprise an exception. Muller points out that in ants, bees and termites the group as a whole, consisting of workers that are all the off-spring of a single individual, shares the variations of that parent individual and virtually is that individual in an expanded condition, inter-group and inter-individual selection here being practically the same thing. In correspondence with this we find social instincts and behaviour and social characteristics in general developed to a far higher level among these social insects than in man or any other social mammals or birds.[1] At the same time the socially processed and directed programme of genetic development shows its own inherent limitation viz. inflexibility even in the field of collectivization. For instance, as Julian Huxley observes, while the parallelism in the social evolution of the quite unrelated ants and termites is truly astonishing, the termites have never produced grain-storers or slave-makers, while the ants have no system of second-grade queens in reserve.[2] In the gregarious mammals, birds and humans the evolution of social habits is tardier than in the case of the social insects, among whom these achieved perfection millennia ago; while intelligence and not merely instinct becomes a factor in the social integration of the former.

The Blend of Instincts and Intelligence in the Mammals and Humans

In organic evolution even where the instinctive equipment shows its marvels, learning and a degree of intelligence are not altogether excluded. Human societies in their coordination of the autonomy and uniqueness of individual behaviour with the harmony and cohesion of the community exhibit the triumph of intelligence in social evolution. But even at the human level the role of instincts and habits though much reduced *vis a vis* intelligence cannot be eschewed. Bentley Glass observes: "In the evolution of the vertebrate line, it would seem that instinct and intelligence were rather equally matched for some 400 million years, well into the Cenozoic era. In fact, in only two classes, the Aves and the Mammalia, has one come to predominate over the other. In the birds, the instincts now have the ascendence, in the mammals, the intelligence." Goldstein analysing human behaviour distinguishes between "concrete' behaviour determined directly by a stimulus and "abstract" performances[3] in which behaviour is not initiated by any external agent but by the account of the

[1] *Out of the Night*: *A Biologist's View of the Future*, pp. 99-100.
[2] *Man Stands Alone*, pp. 237, 238.
[3] A Biologic View of Human History, *The Scientific Monthly*, Dec. 1951.

situation which the organism gives to itself. These latter comprise totally different behaviour of the organism. "Even in its simplest form abstraction is separate in principle from concrete behaviour." Accordingly, the contrast between concrete and abstract, immediate and forward-oriented, instinctive and rational comprises two dominating poles of cognitive experience in the kingdoms of men and of birds. In man, intelligence reaches its highest level, and becomes the dominant factor for conscious social manipulation and integration, instinct being moulded and subordinated in the process; while both his evergrowing intelligence and ever-transformed instinctive equipment shape and transmit an increasingly complex social inheritance. The latter in its turn socially conditions fundamental instinctual and intellectual drives and at the same time elicits new possibilities and achievements.

Human evolution is now on an uneven, uncertain track. Several biologists stress the danger that with the advance of a materialistic, overelaborate and technological civilization the human species may show an evolutionary atrophy analogous to the physiological polymorphism and stagnation of the social insects, among whom independent viability is sacrificed to the trends of high specialisation and social collectivization. Man's social integration and control are, however, conscious, resting on the development of his abstract intelligence, educability and altruism that have initiated a deep, refined, sophisticated pattern of socialization which cannot occur in insects. The efficiency of social organisation among the insects depends on the development of physiological polymorphism and modification of genotype in relation to environmental conditions. Obviously the development of social integration in man rests on the evolutionary trend away from insect polymorphism and towards the deployment of language and symbolic communication and expansion of social impulses and sentiments of identity and altruism. Human symbolic communication and sentiments of self-extension and self-transcendence, rooted in his unique bio-psychology, chalk out the development of his adaptive and survival mechanisms through the learning and transmission of ever more comprehensive and intensified social symbols, traditions and values. At the same time these single him out as a victim of chronic and acute pathological symbolic interpretations, maladaptive values and anti-social behaviour that recurrently block his advance. Nothing in the evolution of animal and the psychology of man shuts out the possibility of man's regression and extinction. Simultaneously this cannot also warrant denial of a prospect of his unpredictable evolutionary progress through greater identity and solidarity and higher empathy and morality, along with the viability of mental traits and capacities and uniqueness of intellectual and emotional reactions of the individual in which he is distinctive. Polymorphism among social insects is the recognition of the evolutionary need of a certain variety of gifts and capacities among individuals that contributes to the progress of biological society which

strictly is found only among social insects and humans. But human diversity is most thorough-going, determining both physical and mental inborn differences in faculties of the human individual and levels of achievement of social organisation or culture. The human individual and the social organisation can, accordingly, evolve together in an unceasing, reciprocal psycho-biological interchange revealing new and unpredictable minds, values and personalities as well as novel qualities and patterns of social integration in the unlimited community.

The Variability of Human Potentials

Of all animals man no doubt exhibits the largest amount of plasticity of behaviour due to his being the least endowed with a genetically determined stereotyped set of instincts and dispositions, and differences in instinct and intelligence as between individuals determining a most considerable range of inborn very high or very low levels of performance. J.B.S. Haldane regards man as the most "polymorphic" species of mammal. Human "polymorphism" according to him, means the differentiation of types breeding together in the same area, the differences being genetically determined. It extends from physical and chemical characters such as stature and hair-colour to innate traits and capacities. Psychological polymorphism, according to this biologist, has been a major reason for the success of the human species. A full practical recognition of the biological implications of human polymorphism, favourable to the development of the peculiar faculties and potentialities of the greatest number of human genotypes is essential for safeguarding the future of the species. A social and economic system in which there is neither freedom nor tolerance nor deviance cannot progress. "Liberty is the practical recognition of human polymorphism", observes Haldane. It safeguards the development of the peculiar intellectual and aesthetic abilities and potentials of human genotypes. Any encroachment on individual liberty and potentiality has, accordingly, serious biological implications for human progress and survival. The present trend of the attenuation of liberties in contemporary civilization, if continued indefinitely in the future, will lead to retrogression, biological and psychological. Such is the gloomy biological prospect for man in an over-elaborate, regimented civilization with stereotyped standards of conduct and patterns of thought and feeling that Haldane envisages.[1]

Human Entombment in Mechanisation and Regimentation

Mankind in the 20th century in its attempts to promote economic and social equality and security shows an increasing trend of regulation and diminution of the area of individual liberty and responsibility in the social organisation. This has happened in both totalitarianisms and democ-

[1] Human Evolution: Past and Future, Whit Burnett (Ed.): *This is My Philosophy*, pp. 41-42.

racies with profound impact upon basic personal rights and moral and spiritual values. All modern states as these accept plans for the overhauling of the economic structure and administer welfare services of all kinds in the interests of social security, justice and equality are tending towards totalitarianism. Totalitarianism is not confined today merely to communist countries. Everywhere it assails and obliterates certain traditional rights and privileges of the individual and reduces the social areas of personal choice and freedom. Philosophers like Bertrand Russell, humanists like H. G. Wells, and writers of fiction like C. S. Lewis and George Orwell agree that human social evolution has reached a stage where science and technology will rule most phases of human relations, and though mechanization, regimentation and standardization have their costs and risks these have to be borne. Bertrand Russell, for instance, considers that scientific civilization in the future means a good deal of reduction in individual freedom that is inevitable. He observes that owing to the increasing need of organization, a scientific society, if it is to be stable, will necessarily involve a diminution of individual liberty as compared with the societies of the past. This is regrettable, but apparently unavoidable. There will be, however, such important compensation that, on the balance, we may expect an increase in human happiness.[1]

Roderick Seidenberg in his provocative book, *Post-historic Man*, that gives a new all-inclusive view of human history, has ably and forcefully attempted to show that while human culture is a living synthesis of instinct and intelligence man has now detached himself from the instinctual, the purposeful and the organic and permitted his intelligence to control one activity after another. "Organisation demands further organization; order demands order. Man, the puppet, animated from within by the hand of instinct, becomes a marionette controlled from without by the compulsions of intelligence." With the supersession of the instincts by intelligence as a dominant directive force in human affairs, man develops his civilization at the expense of his culture. The organization of society proceeds to its final fixity and crystallization similar to those of insect societies that have remained stable for 80 million years. Once intelligence finds its perfect solution it will not permit any deviation. Seidenberg's pessimistic conclusion is that the relentless pressure of his dominant intelligence leads man at length to "the icy fixity of its final state in a post-historic age." "In a period devoid of change, we may truly say that man will enter upon a post-historic age in which, perhaps, he will remain encased in an endless routine and sequence of events, not unlike that of the ants, the bees, and the termites. Man may likewise find himself entombed in a perpetual round of perfectly adjusted responses."

[1] *Science in the Changing World*, p. 205.

Combination and Harmony of Adjustment of Intelligence and Instincts

From the evolutionary viewpoint Seidenberg's assumption of the priority of regulation of life by the instincts is untenable. In the humankind the development of intelligence, the articulation, "canalisation," and symbolic fulfilment of instincts and the social integration are interdependent. There is a harmony between instinct and intelligence, between affective and intellectual life which is favoured by natural selection. Among all vertebrates there is a subtle and intricate total adjustment of instinct and intelligence to the needs of the animal in its environment. Recent studies in bird behaviour have shown that many birds show considerable intelligence and ingenuity, and can do quite complicated things without ever being taught. The cuckoo species, studied by Edgar Chance, shows that of all animals the female cuckoo most resembles man in exercising a choice which fixes her offspring's environment.[1] Exposed from hatching to an alien environment for innumerable generations, the behaviour of the cuckoo, its instincts, are determined by its heredity. Its migrations and all its malpractices follow the pattern of a parent it has never seen. Julian Huxley observes that birds have raised the emotion to the highest pitch found in animals. The line of mammals have done the same thing for intelligence. But, he adds that "because birds are mainly instinctive and not intelligent in their actions, it does not follow that their minds are lacking in intensity or variety".[2] The play and courtship of many birds show considerable skill and subtlety, wide range of powerful emotions and sense of enjoyment and even humour. All these indicate a fine blend of instinct and intelligence. Otto Kochler and his colleagues have shown that the number sense can be developed in many species of birds by careful training. Such counting ability hardly offers biological advantages to wild birds. Matthew's recent remarkable studies in bird migrations show that their sun-orientation mechanism shows a remarkable correlation between individual experience and inborn equipment. Migratory birds possess the innate ability to relate a given direction to the space-time standards innately provided and the observation of these standards to the knowledge of general topography and special land-marks gained from individual experience showing considerable intelligence as well as learning capacity.[3] Previous studies in the homing and migration flights of birds were impressed by the complexity of the action patterns of their inborn instincts, and neglected their intelligence and learning faculty. Recent startling developments of ethology show that among the animals birds are equipped with a complex, innate perceptual organization, while the sensitiveness and fineness of adjustment of many organs of special sense of animals, now being investigated, were undreamt

[1] *The Truth About the Cuckoo.*
[2] *Man Stands Alone.*
[3] C.V.T. Matthews, *Bird Navigation.*

of before.[1] Most intelligent animals in fact are no less driven by instincts. The formation of habits on their part releases the intelligence from attention to routine. Trotter who defines instincts as "inherited modes of reaction to bodily needs or external reaction" observes: "Intelligence leaves its possessor no less impelled by instinct, but endows him with the capacity to respond in a large variety of ways."[2] Intelligence devoting itself to the novel and unusual situations gradually develops as the product of natural selection for adaptability to the novelties, complexities and changing vicissitudes of the environment, both physical and social.

Dangers to Man from the Inroads on both Intelligence and Instincts

Man's intelligence thrives on the novelty of the environment as well as on his freedom and opportunity to manipulate it as he chooses. Already the highly centralised, over-elaborate technological community shows signs of incapacity of the great multitudes of men and women with low average intelligence to cope with the intricate problems of organisation. Any diminution of the average level of human intelligence foretells biological disaster. Man cannot be split into a ruling species of highly intelligent, closely inbred people and a subordinate species of robots and morons. A reduction of the level of intelligence at the bottom will, inevitably, bring down the level of intelligence at the top. Man has continuously to push up the standards of intelligence for the many or perishes. The great danger from a highly organized collective society is not the supremacy of scientific, depersonalised intelligence, as Seidenberg forecasts, but the regression or atrophy of intelligence due to the diminution of the areas of individual responsibility and choice. If this continues on a large and intensive scale, the extinction of the human species is inevitable. For it will take millions of years for the human species to develop and perfect instincts and habits for smooth and automatic adjustment to the highly complex scientific and technological society of today. Man who is now intelligent and adaptable cannot evolve an insect society, dominated by instinct and inflexible physiological adaptation or polymorphism, but will have to leave the scene of the earth to be inherited by forms that have perfected instincts, such as the social insects, or by those birds and mammals which have shown a more harmonious integration of instinct and intelligence than he can achieve.

The complexity and efficiency of social behaviour and organisation of *Homo sapiens* were, no doubt, achieved in the evolutionary sequence through a harmonious adjustment of instinct and intelligence. His danger now comes from the inroads of a highly standardised machine technology and a highly organized totalitarianism on *both* his intelligence and his instinctive and emotional life. Intelligence does not tend now to take place of the

[1] Thorpe: Some Implications of the Study of Animal Behaviour, *The Scientific Monthly*, June 1957.

[2] *The Instincts of the Herd in Peace and War.*

instincts. That is not the drift of historic forces, as Seidenberg would have it. More and more the intelligent choice and judgment of modern man are thwarted and restricted in every sector of life by the increasing "conditioning," control and regimentation of society.

The Many-sided Lapse of Human Self-Actualisation and Spontaneity

Regimentation is likely to increase in the future society and reduce man's freedom due to several contemporary economic and social trends. With the spread of modern medicine and sanitation the undeveloped regions, on account of the rapid and substantial reduction of mortality without corresponding diminution of the present high birth-rate, will experience more and more the dangers of over-population and decline in their standard of living. This will lead to an increasing demand for the modification or overhauling of the economic structure and the development of a social welfare pattern of the State administering welfare services of all kinds. As the shortage of food and other consumer goods becomes acute and economic unrest becomes chronic, the pattern of the State will be pushed towards a totalitarian regime. There will be more and more State regulations and ordinances for rationing and regulation of production and distribution in all these undeveloped countries even where a Communist party or ideology may not be strong and well-organised. Totalitarianism with the central government taking over more and more power and responsibility and aiming at a redistribution of property and income in the interests of social security and justice is likely to spread far and wide outside the ambit of communist blocs. Termites tend to multiply beyond the limits of subsistence. Over-population and extravagant depletion of resources drive them out of their nest and colony and disintegrate their social organisation. Bees, splendidly endowed with the acuity of senses, practical skills and social instincts, live completely regimented lives that shut out all evolutionary possibilities. Ants have established much stabler communities and developed more marvellous and divergent specialized adaptations to different possibilities of living than humans. But like bees they also show extremely rigid patterns of behaviour determined by inheritance, and icy fixity and stationariness in their evolution, its unit being the compound colony rather than the individual. Over-population, over-specialisation and over-organisation—the triple biological errors of the social insects—have significant warning lessons for human social evolution. Another social trend that tends to reduce individual liberty and responsibility in human communities is administration by hierarchical systems. With the advance of modern technology the organisation whether of government, industry, agriculture or business tends to become more and more complicated, centralised and hierarchical. Mankind today in its advance from political to economic and social equality and from small-scale and simple to large-scale, elaborate and hierarchical administration in every field is faced with the fateful

choice between totalitarianism and democracy in respect of the pattern of government with its profound impact upon basic personal rights and moral and spiritual values. Impersonal and technological forces are impelling modern man everywhere in the direction of less and less freedom and responsibility and the imposition of more and more control and regimentation. Aldous Huxley asks the question, "In an age of over-population, over-organisation, and an ever-more efficient means of mass communication, how can we preserve the integrity and reassert the value of the human individual?"[1] In his affective and valuational life and experience, modern man on the contrary shows indeed, a remarkable lapse of self-awareness, self-actualisation and spontaneity.

The Primacy of Secondary Human Goals and Satisfactions

In any advanced civilization man substitutes specious and devious gratifications for biological instincts and fulfilments. He transforms, for instance, his hunger instinct into appetite, his sex instinct into romantic attachment, and his satisfaction of his primary wants into standard of comfort and security. A highly sophisticated, civilized way of living tends to replace the natural biological values and norms of racial experience by culturally imposed, symbolic and often arbitrary and irrational values and norms quite out of harmony with the actual bio-social situations to which he must adjust. By superseding his primary, basic instincts and satisfactions by secondary, adventitious, devious and distorted goals and values, he loses normalcy of his mind and becomes a chronic victim of conflict and anxiety.

Yet, in spite of his being the unique conflictful and neurotic animal, indulging in repetitive and maladaptive symbolic behaviour, he can survive. This is due to several bio-psychological factors. First, his prolonged infancy and childhood and retardation of the growth process with the correlated complexity of his brain and nervous organisation adapt him to conditions of daily conflict and frustration in the fulfilment even of the major biological needs and satisfactions. Any imbalance between biological needs and social demands that results from the rigidity of social conditioning and chanelling may not lead to severe distress and pathological symptoms due to the potential mental flexibility of the individual on the one hand and the wide range of alternative goals and satisfactions offered by the social environment on the other. All societies and civilizations condition the human individual for variable degrees of repression and expression, constraint and stimulation of biological needs so that neurosis or psychosis to which he is uniquely prone is minimized.

The Growing Age of Conflict and Anxiety

Secondly, man's adaptation and survival techniques include symbolic

[1] *Enemies of Freedom*,

living, interpretation and behaviour due to which conflict and frustration instead of provoking his aggressiveness may contribute towards sharpening his awareness, stimulating his thinking and imagination, and creating new outlets of productive expression through displacement, transfer, projection, sublimation and symbolisation. Modern studies of animal behaviour indicate striking parallels between the displacement activities of highly motivated animals in conflict or frustration situations and many non-adjusted human actions familiar to psychopathology.[1] Due to the conflict between two competitive drives, or the environment not providing adequate outlets, the pattern of animal behaviour is "displaced" from its original goal and becomes an expressive ritual revealing the tension of the organism and hardly embodying adaptive value.[2]

Thirdly, man shows a polarity or ambivalence of impulses, emotions and attitudes, love and hate, tenderness and aggressiveness, sadism and masochism, life and death. Such polarity or ambivalence enables him to maintain his adaptive balance through displacement and repression of undesirable biological drives, through inversion into their opposites and through their introjection into self. These mechanisms, however, are not completely adequate for the resolution of inner tensions and conflicts due to frustration. Obviously, the large and complex brain of the human species can shape and sustain symbolic non-adaptive, even disadvantageous patterns of behaviour. It is only when these become too numerous and repetitive that man's happiness, wholeness and even survival are in jeopardy. His high intelligence and imagination, his excessive sophistication and inventiveness may, indeed endanger the species through a dislocation between his biological needs and satisfactions and non-adaptive symbolic modes of experience and behaviour. The evolutionary process is yet to test the entirely new symbolic patterns man has now created and multiplied in his fore-brain and in his behaviour and experience.

Accordingly, the chronic internal conflict and anxiety which are associated with a highly sophisticated and pathological culture, marked by persistent and institutionalised dissociation between biological needs and social demands, tend to depress consciousness, lead to illusion and hallucination and provoke fear and anxiety with aggressive reactions. Man's present state of biological evolution and the present highly sophisticated and standardized character of his civilization have made him chronically vulnerable to anomie, neurosis or psychosis. He does not show a dominating intelligence but rather becomes increasingly vegetative and bovine, and also acquires a perverted scale of goals and values that are dissociated from biologically normal goals and satisfactions. The artificial and distorted

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[1] Russell Davis, Some Applications of Behaviour Theory in Psychopathology, *British Journal of Medical Psychology*, 1954, pp. 216-223.

[2] Tinbergen, *The Study of Instinct*.

mores and moralities of modern civilization increasingly replace the natural biological balance which is man's hereditary endowment. It is this dissociation which results in his widespread and increasing neurosis and psychosis. Mankind has, indeed, entered into the Age of Conflict and Anxiety. Trigant Burrow has analysed the "ditensional" conflicts between man's biological or phyletically determined nature and the unnatural and pernicious figments of his cultural codes, and stressed the racial or phylic nature of man's widespread social disorder. He remarks: "Undoubtedly individuals and social communities are in need of a basic alteration in behaviour-adaptation, but they will find this needed alteration only through specific physiological adjustments internal to themselves."[1]

Recovery of Bio-social Normalcy

The neurologist Herrick agrees with Burrow's etiology of bio-social disease. He considers that the most promising approach to the acute problems of human adjustments is, first, to learn what the native capacities of individual persons are and the biological norms of adaptive behaviour for each of these patterns, and then so to train the persons that their thinking and the resulting behaviour will be biologically normal rather than perverted by pernicious ideologies that lead inevitably to inappropriate conduct and often to personal and social disease.[2]

Another necessary approach is that the modern media of mass communication viz. press, radio, cinema and television should be wisely controlled and discriminately used and prevented from conducting publicity and propaganda of any kind, whether for indoctrination with a type of political ideology or advertisement for any kind of consumption goods from a car to a soap. All new techniques of mass communication tend to by-pass man's intellect and appeal to his lower impulses and desires, fears and anxieties, leaving him an impoverished, impulsive, irrational, day dreaming creature. His thinking, feeling and behaviour are conditioned by various social spells and compulsions engineered by pressure groups, by a factitious system of beliefs, goals and values that may be out of accord with the actual situations to which he must intelligently and rationally adjust.

It is hardly realised by the general public how artfully and insidiously the multi-million dollar advertising agencies today manipulate and purchase their decisions and preferences in respect of the consumption of goods through the use of techniques and methods of what business men call 'motivation analysis' derived from psychology, psychiatry and the social sciences. Vance Packard in an interesting study points out how extensively and cunningly advertising agencies are now using psychiatric probing techniques on little children. It is amazing how easily the consumer's

[1] Trigant Burrow, *Science and Man's Behaviour.*
[2] *The Evolution of Human Nature*, p. 182.

thought, emotion and habit can be conditioned by psychological strategies. Packard observes: "Public-relations experts are advising churchmen how they can become more effective manipulators of their congregations. In some cases these persuaders even choose our friends for us, as at a large 'community of tomorrow' in Florida. Friends are furnished along with the linen by the management in offering the homes for sale. Everything comes in one big, glossy package."[1] The role of modern advertisement through the newspaper, radio, film and television is as astute and pernicious as political propaganda corroding the values of individual responsibility and freedom essential for the development of a free society. In fact, advertisement for commercial purpose and political publicity and propaganda are cognate, disguised and meretricious forms of social pressure that are linked with each other, effectively assailing the mental basis for the human individual, conditioned to visual and verbal tricks and symbols calling out his emotional responses that are as artificial as those of dogs salivating at the sound of the tuning fork.

Aldous Huxley forecasts that the dictatorships of the future will be very unlike those we are familiar with in the immediate past as they will adopt no longer methods of terror or physical violence but new techniques and devices of propaganda including 'subliminal projection' and beginning at an early age. Thus children will be 'television and radio fodder' and grow up as loyal ideologists in dictatorships. The techniques of the so-called "brain-washing" applied to political prisoners in the U.S.S.R. and China indicate to what extent man's physiology and psychology can be played upon until he completely breaks down and then a new idea can be planted in his mind. Such methods, when applied for the training of young administrators, may produce a race of completely one-pointed fanatics and missionaries. Huxley also thinks that the pharmacological revolution that has taken place has brought to light certain powerful mind-changing drugs which may be used for propaganda purposes. Physiologically and psychologically these drugs can alter the mental state but leave terrible results morally and in every other way.[2] Psychological technology, like atomic technology, is not evil by itself. But there is great danger that the modern highly efficient devices of mass communication, especially radio, television and subliminal projection may be used harmfully on an elaborate scale for conditioning and controlling the human individual and suppressing his reasonable and intelligent choices and values, whether in respect of consumption goods and services or political doctrines and programmes, insidiously and malignly as experimental work in the psychological laboratory advances in this field.

More and more the intelligent, discriminative and rational man is

[1] *The Hidden Persuaders.*
[2] *The Listener,* September 11, 1958; *The Scientific Monthly,* July, 1957.

converted into the unintelligent, indiscriminative and unwise crowd or mass man due to the misapplication of modern advances in psychological techniques for the purpose of propaganda. Such propaganda is repeated a thousand times and appeals to the lowest intelligence quotient for reaching the mass in space with maximum efficiency. Here is, no doubt, an unprecedented psychological phenomenon of the mass of humanity responding to "conditioning" in the Pavlovian sense with corresponding regression of intelligence. No wonder that man here and there violently reacts to the social situation where his choice and decision are invaded continuously, and his rational behaviour at the symbolic level sought to be replaced by universal conditioned reflex. Such defence reaction is as true of modern civilized society as the chronic abuse of psychological technology. Like personal stress and strain and neurosis and psychosis, "the revolt of the masses" or the proletariat, as has been discerned by Ortega Gasset, Aldous Huxley, Toynbee and Katherine Horney, among others, has become a basic symptom of widespread bio-social disease in modern communities. The chronic restlessness and upheaval of the masses are the outcome at once of the regression of intelligence, due to mass conditioning, and of the regression of the affective life due to the discord between the symbolic universe of man and his biologic instincts and values.

The fate of *Homo sapiens* rests as much on the recovery of his creative intelligence and knowledge, which must depend upon his larger freedoms, responsibilities and opportunities to plan his resources and way of living in his own manner in every field of life as on the richness and manifoldness of instinctive satisfactions, values and meanings he can derive from the concreteness and immediacy of his life experience. It is a paradox that the most intelligent animal on the earth which has experienced an incredible growth of knowledge and increase of power that cross the boundaries of space and time remains earth-bound and time-bound in his instincts and gratifications. Man is a thinker as well as an actor on the scene of the earth. He cannot think, nor in a true sense live and survive unless he achieves a harmony between instinct and intelligence, and builds his experience with reference to the antinomic modes, complementary each to the other, of emotion and reason, value and rational action, immediacy and eternity.

CHAPTER VIII

HOMO INSTABILIS

Man's Biological Future

Modern man exhibits grave disvalues and crises in every dimension of his living, ecological, biological, social and ideal that threaten his survival. The instability of man is due to the composition of human nature itself fashioned in the long course of his biological evolution. This has endowed him with hereditary impulses and strivings that are generalised and lead to a considerable flexibility of his adaptation. He has evolved away from a stereotyped set of instincts and adjustments. The pattern of his instincts, goals and behaviour is largely socially conditioned, canalised and oriented. From the impact of the social environment on his motivations, values and behaviour proceed both his triumph and defeat, glory and degradation. *Homo sapiens* in the twentieth century, i.e. after one hundred thousand years of his emergence, has become *Homo instabilis*.

Homo sapiens is, no doubt, the end-product of the evolutionary process, and in its last phase responsible for furthering it. But his bio-social and cultural back-slidings, defeats and regressions now for the first time engender doubts about the continuity of the species. The Atomic Age which we have entered is fateful for mankind. It is fraught with the near possibility that man, due to his folly, wickedness and violence, may make his exit from the earth, its scene for one thousand centuries, leaving it to be ruled by certain mammals, birds or social insects. This should focus the attention of all human knowledge to human *potentialities* as distinct from human actualities. The social sciences, including even psychology, sociology and ethics, are, however, still mainly concerned with human actualities, and disregard how man, the unconscious or conscious agent of evolution, can develop his possibilities, create higher values and may not abandon his true evolutionary role. Nothing exposes their doctrinaire character and futility than this, since it is quite evident that the progress of evolution in its moral or cultural phase is now seriously checkmated. Not before the social sciences root themselves in a fundamental "general" theory of human evolution can they develop adequate tools and methods of analysis of human nature and potentialities, values and disvalues, and aid man in playing his true evolutionary role. *Homo instabilis* requires urgently a correct natural history of *Homo sapiens*.

A fundamental 'general' theory of human evolution includes the human biological and ecological theories, the psychological theories of persons and values, the sociological theory of dialectic, and the theories of

morals, religion and education, and obviously rests on making values central in the evolutionary picture of Man. Out of his multi-dimensional adjustments in society and culture, man develops values that enhance, elevate and refine social relations and processes making his adjustments easy and smooth. Without meanings and values, human evolution cannot be understood in its true significance, nor subjected to methodical observation, comparison and experiment. Human evolution, in fact, is a deepening, expansion, accumulation and communication of meanings and values—the patterns of wholes, rhythms or harmonies which in the environment where these are set up promote its evolution to perfection. Man alone among the animals has a universe, to use Gehlen's expression. Due to the momentous biological event represented by the discovery and application of radiology each man finds himself today simultaneously present in, and experiencing the happenings of, every nook and corner of the planet. There is no fragment of the universe which is irrelevant to his meanings, interests and values. The reality to which he adapts himself comprehends the entire cosmos. Man precisely because of his deficiency in organic and instinctual adaptation to a prescribed narrow environment is able to enlarge it indefinitely. He creates his own unlimited environment which is called human culture. From the evolutionary point of view, the interdependence between man rising to his full heritage of a world culture and the organisation of mankind as a whole holds the key to the further advance of the human species. Such interchange is represented by meanings, values and faiths rising to cosmic dimensions—the experiences and norms of the ambient world of future man.

For the definition of man's biological future, the general theory of human evolution measures values and also social relations and institutions, regarded as shelters and nurseries of values according to the dual criteria, viz., the maturation and expression of the World Individual and the integration and harmony of World Culture. This corresponds to Whitehead's definition of the epitomised highly general key-values that mankind has created, selected and consolidated through the chequered process of history viz., the full development and expression of human individuality and uniqueness, or love and the generality of harmony, order and peace.

No human desires and strivings, no groups and institutions can be regarded as biologically "valuable" in the present crisis of mankind, if these do not satisfy the dual criteria, viz., the development and integration of World Man and the solidarity of Mankind-as-a whole.

Man's Common Pool of Traditions in relation to His Potentialities

As human evolution progresses, it more and more differentiates itself from the biological evolution through the development of a pool or reservoir of traditions and culture operated by shared and transmissible motivation, value and symbol systems. The common pool of traditions, values

and symbols is in the course of human history indefinitely extended from familism, tribalism and nationalism to a world system, that unites the separate sub-groups or peoples into which mankind is divided, and replace their mechanisms of internecine competition, violence and power by those of mutual understanding, appreciation and cooperation. The gradual accumulation and dissemination of science, arts and knowledge, the rise and spread of a sense of values in the globe, and their translation into action and the conscious policy of peoples and nations towards the achievement of world peace and solidarity build up a common heritage for mankind. These are all crucial features in the new evolution, carrying the means of control over the old evolution.

The French scientist and philosopher Teilhard de Chardin uses the terms "noosphere" to denote the enveloping global cultural stratum within which the mind of the human species dwells as distinguished from the "biosphere" denoting the aggregate of the organic inhabitants of the earth.[1] The human mind with its shared ideas, feelings and values and its standards of truth, goodness and beauty can only exist within the framework of human society and culture that ever enlarge their boundaries. These foster and determine truths, morals and values and are in their turn reshaped by the latter. The universe of the animal's bodily needs and emotions is extremely restricted in both time and space. Man's universe of ideas, sentiments and values, which constitutes the cultural stratum within which he comes into existence mentally and spiritually, is ever extended and enriched as it deepens and refines the mind of all mankind. Hitherto narrow and egocentric, he participates in the ideas, values and experiences of other selves, and not only builds up a society and a civilization that are temporal but creates eternal and universal objects—abstract symbols of the spirit. His primary moral responsibility towards truths and values arises from the fact that in the cosmic perspective of space and time he is the only creature endowed with values and the capacity to choose and strive after them. Value-seeking and value-striving are, therefore, man's cosmic vocations. It is the supreme instinct and capacity of man to live in the ultimate verities and timeless and universal values amidst the finitudes and contingencies, restrictions and distortions of his life. Such verities and values are eternal and ubiquitous elements of the "noosphere" in which the human mind and spirit live and thrive on this earth. With man's responsibility for understanding, appreciation and use of the "noosphere" any action of his that may disrupt it becomes sacrilegious. He can achieve his evolutionary destiny only when he can participate effectively in the entire "noosphere" of the earth, maintain and operate effectively a common world system of human knowledge, appreciation and consecration.

[1] *The Phenomenon of Man*, pp. 180-184.

In the human realm the violent, wasteful and purposeless methods of natural selection operative in organic evolution are largely superseded by the selection of cultural techniques and traditions comprising the human "noosphere." Competition, struggle and mastery are lifted to the dimensions of myths, ideologies and values and the social and economic institutions derived from them. Not the "noosphere" of a particular people or culture, but the whole "noosphere" of the earth acts as the sieve of human selection and survival. Simultaneously man in his person, values and purposes reaches out to the cosmic dimension. Evolution in the "noosphere" as contrasted with the "biosphere" becomes cosmic in its aim, and creates and deploys the instruments and mechanisms of symbols, truths and values that are cosmic and universal.

As more meaning, value and morality come to enter into the relations of men, groups, classes and nations and the cultural techniques overlie and overcome the techniques of struggle, coercion and domination, man becomes more cosmically human and introduces his own directiveness into the cosmic evolutionary process. Having emerged out of cosmic evolution neither as an accident nor as its inevitable product, he has invested it with his own sense of values, goals and purposes. Evolution at the psycho-social dimension has become much more flexible, subtle and inclusive than organic evolution, depending on the acquisition and transmission of knowledge, learning and morality. Man's cultural heritage during the millennia of his life-history has so controlled and modified the mechanisms of his natural selection that these have now become largely retrogressive in their consequences.

The Genetic Handicaps of Man

Human evolution, to be sure, is at present at a stage of critical transition. Mankind is gradually passing from the stage of unconscious, unplanned and haphazard evolution to that of its conscious direction and control. At every step it is, however, handicapped not only by its lack of adequate biological knowledge and experience but also by its excessive hereditary endowments of anger, aggressiveness and sex. Rage and aggressiveness lead to chronic outbursts of coercion, brutality, violence and war. Hyper-sexuality leads to overbreeding, sadism and sexual aberrations of all kinds. Both trends, equally rooted in man's lop-sided instinctive dispositions, are psycho-pathologically linked with each other, and constantly threaten the regression of the species.

Yet civilization implies a deliberate planning of man's advance through steady, thorough-going and effective limitation of his ego-centric antisocial impulses and emotions and the range of his violence, exploitation and deceit. The ego-centric and aggressive dispositions die hard, while though sympathy, compassion and non-violence are largely extended, these trends are not assimilated to the genetic equipment of an appreciable section of

the race. Due to his inadequate knowledge of the mechanisms of heredity and deficiency in eugenic attention and attitude, man cannot adopt the method of genetic change for controlling and directing his evolution. He can and does consciously and deliberately select and breed domestic animals and plants, but with regard to his own genetic characteristics and possibilities he is helpless and heedless. Planned genetic transformation, if it were possible for humankind, would have quickly replaced natural by artificial selection, and led to a conspicuous and rapid improvement of the genetic constitution of the race and the entire level of its achievements and potentials.

Unconsciously, however, mankind directs human evolution through the system of human breeding it adopts that is linked with the status-system of a culture. It is the mating groups with their conventional boundaries of class, status, profession or occupation within the community that through sexual discrimination and segregation select culturally and genetically the patterns of human attributes and values which a particular society or culture favours.

Besides, mankind unconsciously controls human evolution through laws and punishments, medical and educational systems and measures of taxation. As the consequences of such political actions are carefully studied and appraised, a planned direction of human evolution may emerge in the future. Punitive or rehabilitative programmes of punishment of crime affect differently the reproduction of criminal groups. Poor laws and administrative measures against vagrancy and pauperism affect the reproduction of shiftless and improvident groups. Medical treatment of physically and mentally handicapped persons preserves many tainted genes which otherwise would have died out. The preservation for life and reproduction of the hereditary weaklings indirectly promotes the multiplication of children with genetic defects and infirmities, who in their turn would come to hospitals and other agencies for saving their lives and earning their livelihood. The advances in medical science through saving the genetically unfit brings more unfitness into the world and more inheritance of the factors that promote unfitness. Some biologists point out, however, that the rise in the rate of harmful mutations and the consequent increase of the incidence of inherited weakness would take a few hundred generations to produce their full effects. A programme of compulsory schooling and free education at all levels leads to qualitative changes of the population in the long run, while its immediate favourable effects are also discernible on mating boundaries—what are crystallized as exogamy and endogamy in old sedentary civilizations like those of India and South-east Asia.

A system of progressive taxation and a programme of social security in general and family allowances in particular influence differential fertility and mortality. Birth-control and free distribution of contraceptives in

State hospitals and clinics on one side, and a family allowance programme on the other change the motivations in respect of the size of the family within a short period, and produce significant demographic results. Germany, Italy and Japan are glaring instances of countries which have increased or reduced their birth-rates within a short period through appropriate population policies sponsored by the State and accepted as parts of the family mores. A qualitative improvement of population, especially the growth and diffusion of intelligence, may result from the processes of elimination, called "negative" eugenic programmes, aimed at the sterilization of persons with congenital defects, usually feeble-mindedness and mental disorder.

Recent advances in genetics including the study of the inheritance of specific psychological attributes in man are clarifying and stressing the social role of marriages in human advance. Marriages of individuals with various types of physical and mental defects and maladies are already prohibited by legislation in many advanced countries; while public opinion favours marriages endowed with positive potentials for the enrichment of the human stock. This will be evident from the following declaration of the Pope :

"As far as possible, deficiencies already in evidence must be remedied and care must be taken that hereditary factors even of little value be not allowed to deteriorate still further by fusing them with a homozygote partner. On the other hand, it must be seen that positive characteristics at their full value join with those whose hereditary patrimony is similar."[1] We should, however, be a little cautious in respect of the promise of positive eugenics due to the present rudimentary knowledge about it. One of the leading geneticists of the world, J.B.S. Haldane, considers that at present we do not know of a single rare gene in man whose frequency we should increase. He observes, "The discovery of rare and desirable genes in man will need a vast programme of collaboration between geneticists, physiologists and psychologists. Until even one such gene is known, it seems to me rather futile to talk about a programme for positive eugenics."[2] But negative eugenics does promise favourable biological consequences though not to the extent as often imagined. Throughout the world negative eugenic measures are likely to be adopted by Governments, and more and more people with harmful dominants may be persuaded to refrain from reproduction either by continence or by contraception. This may lead to the propagation of intelligence and social feeling but obviously at an exceedingly tardy rate. Artificial insemination that has been already adopted by England may also have a direct consequence on the propagation of

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[1] Quoted in Murphy : *Human Potentialities*, p. 227.
[2] *Human Evolution, Past and Future* in Whit Burnett (Ed.): *This is My Philosophy.*

intelligence.[1] The rigidity of the breeding system connected with the stratification of communities into classes and castes which remain more or less closed groups will no doubt be gradually relaxed in the future as the result of egalitarian social trends especially in the democratic countries. This will improve the genetic attributes of the population. Darlington observes: "Throughout history there has been a crystallization by inbreeding, that is, relative inbreeding of tribes, classes, castes, and races. Ever and anon this crystallization has been interrupted by the opposite process of melting and fusionw hen the barriers to mating, for a decisive moment or for a whole generation or more, break down and new groups are formed following conquest, revolution, famine, pestilence and adventurous migration."[2] The process of democratisation, as it is enlarged and deepened, will lead to the dispersal of the pools of chromosomes. As new mating groups will appear, the patterns of culture will change. Similar long-range or evolutionary consequences may follow in democratic communities from the reformation of classes both culturally and genetically conditioned as were evident due to racial admixture in the New World in the last century. Legislation promoting the decline of illegitimacy is also enacted by many civilized governments. This may also influence the quality of the population favourably.

The Dysgenic Trend of Populations

Very few modern countries consciously adopt and implement a rationally conceived demographic and eugenic policy. The majority of the nations show concern with politics, rather than with the elemental forces of human biology that govern in the long run their capacities and possibilities. By and large, most nations now show on the contrary dysgenic trends of growth. The more intelligent and more capable groups in most cultures tend to have a lower birth-rate than the average people. Both the adoption of contraception and the extension of medical facilities are largely responsible for the dysgenic trend of mankind, viz., the faster multiplication of strains that show lower intelligence capacity and heritable educability. Cyril Burt estimates that by the end of the present century there will be in Great Britain half as many children of scholarship ability as there are at present and twice as many defectives, while the average intelligence of the population as a whole will have declined by five Intelligence Quotient points. The same rapid deterioration of the quality of population will be marked in all advanced countries in Europe and America, especially in those that will show stationary or declining numbers.[3] Darlington remarks: "Races, classes and individuals of technically backward types, which would not be capable of surviving unassisted, are now multiplying out of

[1] Darlington: The Control of Evolution in Man, *Nature*, 1958, 14.
[2] Darlington: *The Facts of Life*, p. 286.
[3] Burt: *Intelligence and Fertility*; also Anastasi: *Psychological Bulletin*, 1956.

proportion to those races, classes and individuals to whose initiative and intelligence they owe their multiplication."[1]

The dysgenic trend is particularly true of Asian peoples who show a higher average birth-rate than the world rate. Biologically speaking, parents of large families are undesirable genetically. Accordingly, the teeming millions of Asia exhibit the menace of both over-population and mispopulation. The races of Asia who with their improvident prolificness already represent more than half of the world's humanity may materially contribute to bring down the world standard of living as well as the quality of world population if they continue their present high birth-rates, at the same time increasingly curbing death-rates by medical programmes. Only a few prolific nations can, therefore, alter the course of history or of human evolution.

Over-population and the Biological Decline of Mankind

Man endangers his biological future more by excessive multiplication than perhaps by any other social process. Most gregarious mammals avoid excessive breeding through a variety of ecological controls such as migration, modification of the system of eating and being eaten and territory system. The social insects practise massacre and swarming along with the adoption of polymorphism and discriminative larval feeding and nurture to bring down numbers. In spite of theo peration of a subtle, inter-weaving chain of ecologic checks and balances that establish an equilibrium, however viable, between animal populations and their environment, an essential condition for organic evolution is the process of natural selection due to animal numbers outrunning food supplies in limited overcrowded environments. In human evolution the same inexorable biological law, so strikingly applied by Malthus, prevails if men persistently outstrip their existing and potential resources, and at the time increase economic pressure and competition through overlap of the environments of different peoples as the result of migration, commerce and scientific and technological advance. On the other hand, it is through the acceptance of controlled parenthood that the human species can direct its own evolution without the dangers of prolificness. Fertility is both the cause and effect of natural selection among plants, animals and humans. An adaptive level of human fertility through a world-wide adoption of birth-control is the only way of achieving freedom from poverty and severe environmental pressure, i.e. from "the law of the jungle" among half, and possibly two-thirds of humanity today. An essential prerequisite of planned human evolution is, no doubt, planned reproduction. This implies that man should civilize sex and develop proper reproductive habits and attitudes that can ensure the optimum size and quality of his family in relation to his material standards and ideal goals

[1] *The Facts of Life*, p. 335; also Medawar: *The Future of Man*, p. 86.

and values of living.

The Need of a Global Population Policy

Population and family planning adopted as a world programme can alone in the present world demographic crisis safeguard the living standards of the species and counteract its qualitative decline, at the same time assuring its economic stability and peace. The economically unified world cannot remain half famine-stricken and miserable, and half affluent and luxurious. The sudden explosion of European population during the last century and half and European colonialism were responsible for an unprecedented disparity of living standards between the privileged and under-privileged peoples of the earth. Two-thirds of humanity now consume less than 5 per cent. of the primary materials. Three-fourths are living below sub-human standards. The privileged minority in order to maintain and develop a highly sophisticated standard of material comfort has been simultaneously depleting the world's exhaustible resources at a most alarming rate. The world's supply of oil and important minerals cannot last beyond twenty-five years foreshadowing world-wide misery for the entire posterity.

The population policy in the modern age must accordingly be global. It should include not only family planning among the under-developed peoples, but also no further increase of the high material standard of living of the affluent nations.

Firstly, an organised movement for family planning supported both by the State and intelligentsia is crucial for the welfare and progress of the under-developed peoples and for world stability. Family planning should be adopted in under-developed countries not as an isolated and piece-meal programme but integrated with an over-all movement of education, social security and equality that may be conducive towards a new outlook in the family.

Secondly, the standard of living of the favoured peoples should have some relationship to their habitat. It should depend not on the exhaustion of limited and irreplaceable natural resources anywhere on the earth, but rather on the preference of flow or revolving to fund or exhaustible resources, even at the expense of economic value, and calling for a sacrifice of the present for future generations. Depletion of scarce resources anywhere is shrinkage of the economic base everywhere.

Thirdly, the affluent nations who are now in a position to satisfy all their felt wants should not further augment their already high standard of material comfort, but divert their surplus savings for the economic development of under-developed regions. This is necessary for the stability of world economy and of their own social structure. It implies a reorientation of the value and culture pattern of affluent societies in the direction more of non-material goods and services, leading to new dimensions and qualities of human

living and adventure.[1] A global population policy will contribute towards the gradual raising of the average longevity of peoples from thirty or less to sixty or more. It will mean that the majority of populations in both old and new hemispheres will show a preponderance of the higher age-groups from forty five and over. A larger and larger number of persons will survive into their seventh to hundredth decade. There will be a far greater social premium placed on youth, and also on the value of peaceful, leisure-time pursuits for an increasing proportion of the population which reaches beyond the young age. This is bound to raise the problem of war and peace most acutely in the biological dimension. While the biological decline of mankind is linked with numerical increase, biological progress is linked with a restrained growth of population. Without the global population being considerably less than at present, an improvement of the human quality is not possible. A hungry, raging multibillion human population, conditioned by diminishing returns and increasing social pressures and constraints, cannot foster the emergent qualities of vigour, longevity and enterprise as well as of mind, personality and values.

Over-organisation and Biological Decline

Equally with many species of animals man brings about his own biological deterioration through an excessive specialization of functions, values and capacities. In animal evolution the excessive specialization of organs and functions, adapted to a particular ecological niche of the environment and to a specific way of living, operates as a bar to further major orientations and advances. Many social insects, for instance, have shown no modification for millions of years though they are most closely adjusted to the specific ecological conditions and pressures of the environment they exploit. The instinctive way of social living is at its best with ants, bees and termites, but it is a rigidly stereotyped and inflexible pattern throughout the entire course of each short life of individuals. Man's complex, materialistic and technological culture, which comprises the world culture of today, markedly increases his regimentation and curtails his creative intelligence, freedom and responsibility everywhere. More and more his goals and values and his behaviour adaptation are also conditioned by various social compulsions. Over-organisation and over-specialization, associated with modern machine technology, and over-conditioning, associated with modern media of mass communication, tend to atrophy human intelligence, and develop habits of smooth and automatic adjustment at the lower instinct and reflex level characteristic of ants, bees and termites. Such trends challenge the harmonious blending of instinct with intelligence, and of emotion with reason, on which man's biological supremacy is largely based. His specialization in the direction of more and more social control,

[1] Mukerjee, *Population and Human Values*, Address before the International Conferenc for Planned Parenthood, 1959.

conditioning and automatism and lapse of his self-awareness and spontaneity spell as much biological peril as the sorts of over-specialization that led to the extinction of many large predatory reptiles.

For human evolution, cultural isolation that arises out of an opposition to contacts with the outside world, sense of racial superiority, chauvinism or an extremely narrow and rigid conformity to certain social and economic systems and ideologies also represent lop-sided specializations in cultural techniques that are biologically harmful and retrogressive. These hinder the interpenetration and cross-fertilization of the noetic system that alone can assure man's further advance. Only a shared noetic system can nurture and develop the unpredictable potentialities of men living within the ambits of different cultures.

The Dual Phases and Mechanisms of Human Evolution : World Man and World Culture

Biological evolution has now come to a dead end except in the human sector. Julian Huxley estimates that the insects reached a dead end thirty million years ago, birds a little later and all the main lines of higher mammals except the primates at about the same time.[1] As long as man does not annihilate himself but continues to exist in his particular life zone, there is no possibility of any other animal to compete with him in intelligence, social organisation and use of tools and to oust him. "Man's general environment," observes Simpson, "was among the last to be filled by life. It is really legitimate to go beyond this and to point out that man's particular adaptive type was the latest to be developed up to now in the history of life, one radically new, never before exemplified, and with extreme potentialities of expansion."[2] It is the depth, richness and creativeness of the human mind, personality and values and the enlargement of the human community that reveal progress in conscious or social evolution. The two are facets of the same evolutionary movement marking a higher stage of human advance. On the one hand, a more integrated, self-actualising and self-transcending man contributes to psycho-social evolution by the increased realisation of his potentialities. On the other hand, a more united world or increased solidarity of the human species makes the evolutionary process operative more consciously, hence more freely and efficiently. The phases or mechanisms of progress in the future for the human sector are, accordingly, two-fold, viz., the building up of a common stock of traditions for mankind or a World Civilization and the development of open, free World Men. These are interdependent. Within the structure of a common world civilization the world man emerges in reciprocally understanding, appreciative and cooperative groups of nations and cultures. Its fundamental mechanism is the assimilation by each and every culture of the intellectual and cultural techniques and traditions of the age that

[1] *Evolutionary Ethics*, pp. 36-37.
[2] *The Meaning of Evolution*, p. 248.

may be unified into a universal symbol system of comprehension. The more a given culture profits from the vast, accumulated and organised knowledge of the sciences, arts and humanities of mankind, the more can it develop the potentialities of the individuals within it as they actively participate in fresh intellectual adventures with their unpredictable values and experiences. Scientific thought and knowledge have been unified today into a comprehensive world picture, embracing cosmic, physical and biological nature that will gradually win world recognition and acceptance. As modern science and technology spread and disseminate, there will be no nations, nor cultures nor social and economic systems left that will be ruled by magic, superstition and purely dogmatic formulations. More peoples of the world will enjoy freedom from want, from ignorance, from fear, from ill-health and from suffering, and will demand more science, more technology, and more knowledge. There will be greater appreciation in the world of the unity and universality of the human evolutionary process with indefinite possibilities of fulfilment yet unrealised by the under-privileged peoples and cultures. Larger areas of the earth and greater numbers of the world population will understand and consciously identify themselves with the integration and progress of mankind-as-a whole instead of acting as hindrances and drags.

Mankind's improved scientific understanding of the cosmos from atoms to galaxies and from individuals to human civilizations reveals the pool of world knowledge as a microcosm which both reflects the cosmos, and controls and directs cosmic, including human evolution. Correspondingly, there is an increase of pressure towards the unification of mankind for survival and progress through world-wide economic and political institutions, and the symbolic agencies of art, morality and religion, equally operative on a planetary scale. The scientific picture of the unity of the earth and the symbolic picture of the moral and spiritual oneness of mankind tend to coalesce. This results in unparalleled vigour and intensity of the system of world symbols, traditions and culture. The latter will absorb and assimilate all individual cultures and transform highly individualized persons of specific nations and cultures into world-individuals. For evolutionary advance of the human species there are two constructive forces of the highest potential : the altruistic conscience and missionary fervour of the integrated, self-transcending world-individual who surpasses the state, nation and culture; and the creativeness and intensity of the system of global understanding, appreciation and cooperation.

Conscience, the Agent and Drive of Human Evolution

Modern exploration of the unconscious processes of the human mind reveals that man can undertake the dominant role in the collective adventure of global unification from the innermost recess of his self. His partnership with fellowman, with the earth and with the cosmos, involving

the participation of the entire species for its evolutionary destiny, can spring from the instinctive unconscious background of his personality. Modern man needs a new tool for dealing with his destiny, a new *conscience* embedded in his unconscious.

Human evolution has introduced into man's instinctive life the superego or conscience as the expression of his sociability. But while conscience is the internalization of social and cultural norms and standards, it also expresses the wholeness of his personality poised in relation to the community and the cosmos that are also wholes. The former is the authoritarian and primitive aspect of conscience, the latter is its mature, creative or altruistic aspect. With the development of the human species the superego or stern and tyrannical conscience is increasingly replaced by the creative conscience, shorn of the primitive aggressiveness and tension of guilt, and assimilating strong positive and intrinsic values of goodness, love and wholeness. Between man's internal moral framework of conscience, which is partly inherited and primitive, and partly adapted, acquired and unique, and his external moral framework, as represented by the legacy of his culture—his myths, values and ideals—that is wholly acquired, there are constant action and reaction, inward and outward.

Man in the course of his mental evolution assimilates, through the dynamic interchange between self, society and cosmos, notions of love, altruism and beauty and disavowals of hate, evil and ugliness into his personality structure as mature, altruistic or humanistic conscience. Altruism is more deeply ingrained and more powerfully developed, and hence more symbolically and normatively elaborated in man than in any other animal. Trotter observes: "Man is altruistic, because he must be, not because reason recommends it. The individual of a gregarious species can never be truly independent and self-sufficient. Natural selection has ensured that as an individual he must have an abiding sense of incompleteness. This is the psychological germ which expresses itself in the religious feelings, in the desire for completion, for mystic union."[1] There are greater sensitiveness to the pain and suffering of fellow creatures, greater tenderness and love, altruism and compassion with human advance. What the Buddha, Christ, St. Francis, Chaitanya, Gandhi and Schweitzer felt through the centuries may come to constitute the conscience of the average man as social evolution proceeds further. In the evolutionary process love, sympathy, compassion and cooperativeness have gradually obtained the drive and impetus of the unconscious. These have become a part as much of man's organic as of his social heritage.

Accordingly as social evolution progresses, the refinement of the moral framework, values and ideals of culture becomes internalized within the structure of the human personality as conscience. In man's mature conscience

[1] *Instincts of the Herd in Peace and War.*

are implicated the whole of his genetic history and social and cultural evolution as well as his transcendent knowledge and experience of love, goodness and beauty. Instinct, which is the gift of animal evolution, and is associated with strong emotions springing from the depths of the unconscious, and learning and faith which are acquisitions of mental and cultural evolution converge in the conscience of man. With an alert, sensitive, mature conscience he can make value judgments quickly and largely automatically, and use his intellect and judgment for comprehending a larger range of inter-personal factors for concrete actions in emerging social situations. The transformation of man from an instinct-driven animal to an evaluating, sensitive, responsible moral person is, to be sure, embodied in his conscience that gradually replaces natural selection as a mechanism of human evolution. Mature, creative conscience takes cognizance of all contingencies of life, internal and external, intuitively apprehended and intellectually perceived, that are implicated in man's choice, and unerringly and unhesitatingly guides and regulates his decision and action. Man is unevenly equipped with conscience as with his impulses and intelligence. But the true and good man's conscience carries with it the wherewithal to transcend himself and the social situation. It is the only tool for evolved man to overcome his depravity, wickedness and regression, and to direct himself towards beauty, goodness and perfection at the cost of much pain and suffering, even death. The evolved man's conscience is the true custodian of human worth, dignity and perfectibility.

With his imagination and intuition man comprehends and appreciates the strange cosmos into which he is born, sees it with greater awe and wonder, and enriches it with new and valuable meanings, values and experiences. In so far as he finds himself spiritually at-home with the cosmos, his conscience responds to it, loves it, adores it and identifies itself with it. Conscience is the supreme guardian of perfection, wholeness and completeness of man and universe. It is the final and impeccable voice of human universalism and cosmic universalism. It fuses the human universe into the infinitely larger meaningful, purposeful cosmic universe. Conscience impels and sustains the endless quest for truth, wholeness and holiness, the discovery of unknown patterns of beauty and significance in the cosmos, the mystical exploration of the unnamable, incomprehensible and sublime and the dedication for altruism and service to all sentience, and thereby make the cosmos more conscious of itself. The goal of cosmic evolution itself is the emergence of conscience which, to be sure, takes charge and directs the course of the cosmic process of evolution that up till then had been uncertain, inconsistent and haphazard. Religion, mythology and philosophy sometimes identify conscience with the unknown God, with the cosmic order and harmony, and with the soul of the All and Being, all of which reveal the full possibilities and implications of the goal of evolution—a collective faith of the human species calling for its

highest intelligence, love and transcendence and directing it to unknown vistas of fulfilment.

It is clear enough that the vital source of all advance in human values and potentialities is conscience, which unceasingly impels man towards wholeness and transcendence, and unerringly and unequivocally prophesises his attitude and way of living. Such are the bio-psychological functions of conscience in the open or transcendent evolution of man. He must look before and after both as individual and as species. He has, therefore, evolved inner mechanisms and functions for forecasting himself and his conduct of life with clarity, sagacity and certitude. The world of physical events and processes is subject to prediction and control by the laws of nature. The world of human values, behaviour and experiences is similarly forestalled and governed by the laws of conscience. In such anticipation and control of his life and fulfilment man intuitively assumes a capacity to achieve beyond the human.

Evolution's latest, noblest, yet most slipshod mechanism is human conscience. Having its dim, tentative beginnings in the directiveness of lower organisms, it is now woven into the very texture of human personality from childhood. The entire animal heritage of man and the inheritance of his millennia-long history and civilization are epitomised in the voice of conscience having the tenacity and impulsion of the unconscious dimensions of his being. It, accordingly, speaks with both unerring certitude and profound intensity of emotion amidst the chronic distortions of values by culture, the clamant and often contradictory demands of group and society and the tragedies of personal life. Conscience, inspired by altruism and guided by knowledge, has now become the trustee and agent of cosmic evolution. Remaining largely unconscious and impersonal, it carries man to the roots of his being, to the very principles of life in general. It opens up unknown and untested modes of human being and becoming, and is analogous to the "pre-adaptation" of many lower animals that is specialization coming in advance of immediate biological needs. Such is the "pre-adaptation" or transformation of local, regional and national persons into Cosmic Persons, and of finite and limited societies, nations and blocs of nations into the ideal Cosmic Mind and Community that humanity now gropes after uncertainly, and yet so persistently. Without these, human progress, and hence the progress of the cosmic process of evolution, will not only be checkmated but enter into blind alleys of defeat and regression.

The present century in which man has become for the first time conscious of his sole responsibility for continuing evolutionary advance should not permit any lapse or feebleness of conscience but rather enkindle it as the basis of rational choice and action. Unfaith and callous and feeble conscience are the outcome of his lop-sided intellectual advance that eschews other areas of normal interests and values. As Jaspers observes: "In

unfaith the human condition becomes a biological fact among other biological facts; man surrenders to what his finite knowledge determined as necessities and inevitabilities, he gives in to a sense of futility, the energy of his mind declines. He stifles his supposed factuality. Philosophical faith, on the other hand, is the faith of man in his potentialities. In it breathes his freedom." The discovery and adequate and effective use of human potentialities make the problem of conscience critical for the destiny of the species.

CHAPTER IX

THE TRANSFORMATION OF HUMAN NATURE AND ENVIRONMENT

Man, the Creature and Master of the Environment

Man, who is the climax and end-product of the evolutionary process, has developed certain faculties and strivings that may and should enable him to become its agent and trustee. This choice and responsibility he has attained through the development of his mental powers and capacities, and the acquisition and transmission of social traditions and values that constitute the non-biological heritage of his acquired environment. As the super-dominant creature of the earth, with his developed brain and mind, language and tools, he has ranged so widely over the various continents, and has been so successful in his acclimatisation and control over physical conditions that he has been able to achieve and maintain a common global tradition. Even the highest social insects, viz., the ants, after about fifty million years of their tenure on the earth, have failed to create a global ant tradition.

Man's physical and mental characteristics seem to be influenced by natural selection in different ways. The configuration of his body, the colour of his skin, the form of his nose, the blood-group and other physical traits possess, or at least possessed in the past, differential survival values in different environments in the course of his adaptation and migration in various climatic zones of the earth. These differentiate in large measure races and peoples. The direct and indirect effects of dietary, type of labour and occupation and pattern of living in particular environments stabilise physical and mental differences among the various stocks of humanity that are sharpened by inbreeding through the generations.

At the same time the course of human social evolution invests man's genetical constitution, not with fixity of behavioural traits within the limited mould of biologically pre-determined responses in specific regions, but with educability, mental plasticity and variability of adjustment as species traits. In man's selection and survival both genetical stability and plasticity are essential; but even more essential are his psycho-social stability and plasticity. As the mechanisms of evolution have in the main become social and conscious rather than blind and automatic, evolutionary progress depends on the reconciliation of tradition with novelty, of stability with change, of security with expenditure of energy and resources and of localism with universalism. Thus alone can man come into increasing harmony with his external social heritage and ensure his biological future.

Human Genetical System and World-wide Environment

Life at the psycho-social level favours plastic genotypes that show mental capacities to re-adjust, improvise and invent responses in terms not only of a particular region and culture or form of social organisation, but also in those of the global tradition, which only the human species creates, maintains and transmits. It is man's greater capacity for learning and mental flexibility which have not only given him dominance in the animal kingdom, but have also built up his unique global social environment to which he is increasingly exposed. Of all living species man can occupy and exploit all parts of the globe. Not only through industry, commerce and migration but also through the dissemination and intercharge of science, knowledge and culture he develops a global tradition which largely determines the conditions of his fuller and more wholesome life and of his further advance. Kenneth Mather observes : "With other species the environment depends little if at all on the individual's heredity. This is no longer true with men, who not only make their own environments for themselves, so that they can live in hot, cold, wet and dry parts of the world at will and now even proposes to devise ways of living in space, but who also make environments for one another." Man represents today a flexible genotype with the capacity to adapt itself to any part of the globe; while his environment is modified and transformed in a measure so as to suit the species as a whole. The global environment, physical and social, comprises the milieu for his selection and survival in the future.

Man's tools, traditions, symbols and culture in any particular region or culture belong to the species as a whole. These promote the dual features of the evolution of man both as individual and as species in different parts of the globe, viz., the mental development of the human individual resulting in the full realisation of his values and potentialities everywhere, and the enrichment of his external social inheritance, both on a shared basis within the overall unity of world knowledge and culture. Biological evolution in man is brought about by the improvement of his genetical system so that he can accommodate himself to different environmental conditions and possibilities, and also develop his unique creative traits, capacities and values on one side, and his control of the environment directed towards making adaptation of the organism to its specific aspects less necessary on the other. Both these make him increasingly independent of the external environment or increasingly capable of maintaining internal conditions in spite of external stresses and strains (homeostasis) and accelerate the rate of his evolutionary change. The genetical system of human population is characterised by greater individual versatility, while its environmental control is more thorough-going than we meet with any other species.

Mankind in the future will be a mongrel breed, even showing greater

disparity ot the traits of the individual, physical and mental. There has been far more racial interbreeding in the century than even in the past. The modern trend is towards the gradual obliteration of regional differences of the so-called races. North and South America are today the melting-pots of genes, and new brands are appearing and stabilising themselves due to the mixing of the indigenous populations, Negroes from Africa and diverse stocks and strains from Western Europe. In Japan there has been recently a mixing of European and Asian strains due to the army of occupation. For centuries in Asia south of the Himalayas and their extension eastward the Ta-shuch Shan ranges racial blending has been silently going on and the new mixtures show intelligence, vigour and comeliness. In a more unified world of the future the differences between the ethnic types, produced by geographical isolation, will fade away and the human species will be tied closer as peoples will show less differences of physical features and none can pride themselves in pure and undefiled ancestry.[1] Yet the mixing of genes will foster variety rather than uniformity. The differences between man and man will grow rather than diminish. While the mental variety and plasticity based on physiological blending will contribute to man's advance through a uniqueness of his individual qualities and capacities, the control and improvement of his environment will be more and more effective through the communication of the results of science and technology on a globals cale.

Man's further biological advance, rooted in the improvement of both his genetic and acquired mental powers and potentialities, largely depends on individual cultures favouring and selecting genotypes with greater and greater educability, plasticity and catholicity of mind and behaviour and on the development of the common social heritage and conscious cooperation of mankind-as-a whole. The progress of genetics, experimental embryology and eugenics suggests that man in the future can modify the biological potential of his succeeding generations in favour of greater open-mindedness, catholicity and interchange of social behaviour and values through influencing the genes. If selective breeding and training had perpetuated caste and class systems among different peoples and civilizations in the past, why cannot mankind hope that biological disciplines may be harnessed in the future into the making of open men and open societies as it takes charge of evolution in its own hands? Only by choosing the open aims and activities of the One-World-Individual and One-World-Community can man transcend the limitations of natural selection that has so far governed his purely biological evolution, and determine the direction of his evolutionary advance, biologically and culturally.

The Global Range of Human Evolution

The human species is now at the cross-roads in its life-history. There

[1] See Boyd: *Genetics and the Races of Man.*

is today an intermingling of the old biological and the new psycho-social evolution in human relations and behaviour. Never has mankind wielded such formidable tools of science and knowledge and of hands that can lead to its self-annihilation in intra-species competition and conflict. Nor has it at the same time acquired such tools of reciprocal understanding, appreciation and consecration of the various peoples that can mould the whole-man of peace, love and compassion and mankind-as-a whole into the brotherhood of the species in very real senses. Mankind's hope and promise of ultimate replacement of the mechanisms of rivalry and struggle of the old biological evolution rest on these. Human civilization, global in its range, aims at the conscious and systematic control and direction of the old biological evolution embodying the ethics of man's survival and the full realisation of his potentialities. Its means are two-fold: the integration and growth of the personality into the Whole or Complete Man as personal responsibility in every culture and the development of mankind-awareness, feeling and cooperation of different States and peoples as collective responsibility. The two are interwoven and comprise the new dual mechanisms of psycho-social evolution superimposed upon and over-riding the old biological mechanisms of constant, relentless struggle for dominance, power and mere survival.

In human life for the first time in organic evolution, the law of struggle and survival is overlaid and dominated by the ethics of cooperativeness, harmony and balance for the individual, for the species and for the whole of life. In fact the bio-ecological laws of correlation, interchange and symbiosis of the diverse forms of life to one another and to their collective environment give a truer picture of the general evolutionary process than the law of ruthless struggle, natural selection and survival. Plant and animal ecology demonstrates the unity and solidarity of life in an ecological area maintained by an intricate web of linkages that interlock the lives of a single plant and animal, or species of plant and animal, and subordinate these to the welfare of the species or the "biocoenosis" as whole. It is in this subtle "web of life" that the great biological gains of the past are in some measure recorded and systematised. In the perspective of evolution the "web of life" becomes more ramified, more intricate and more coherent and comes to direct the progress of the ecological system as a whole with its spontaneous harmony, orderliness and hierarchy of communities. Cannot the human species obtain the biological lessons of its stability and progress in its global environment from the symbiosis, cooperation and the balanced, self-regulating organisation of the life-communities of nature? Biological progress reveals the increasing diversity as well as solidarity of species of life, intricately, coherently and harmoniously adapted to one another so that the total environment becomes more suitable for all species of life.

General Ecology that comprises plant, animal and human ecology today stresses the reciprocal relationships and balances of living communities in the habitat representing an antithesis of the inevitable outcome of a cosmic process of natural selection. The broad ecological trend of mutual interconnectedness and harmony of innumerable kinds of living species, knit together in a harmonious self-regulating organisation, has obtained a unique significance in human evolution. Thus a re-interpretation of the plan of nature formulated by Darwinism is overdue.

Stability and Versatility in Human Social Evolution

Man in the course of psycho-social evolution has reached a stage in which adaptation, stability and versatility as well as control of the environment have changed their forms or patterns for his maximum biological fitness. Adaptation is now lifted to the dimension of adjustment to the acquired external social environment, which has become the more or less durable medium of organic adaptation and selection of individual traits, capacities and achievements. Unlike any other animal, man in some measure modifies through breeding his genetic equipment, and in large measure his non-biological, acquired environment for the purpose of his adaptation. Such control becomes easier where his acquired social environment is not too rigid and restricted by custom and tradition, but is flexible enough for embodying and expressing the idiosyncratic needs and values of individuals.

The old conflict between stability and versatility is renewed at the new psycho-social stage of evolution in a new form. Human advance rests on the balance between old and new goals, values and traditions so that the change may not be conflictful. The genetical and environmental improvement can lead to human advance only if aimed at the right goals and values of life, i.e., the maximum enrichment, creativeness and integration of the human individual, on one side; and the maximum enlargement of his external heritage of acquired social environment on the other. For man's biological progress the increase of individual versatility which marks him out among the animals, must be directed to the qualitative improvement of his unique attributes, goals and capacities that have been evolved by social, not biological, mechanisms, and that fit him in ever-more perfect harmony with fellow-man and cosmos. Stability in the new context is also largely the outcome of the external social heritage. Man has acquired a degree of stability that no other species can equal due to the facilities of symbolic communication of the accumulated traditions and culture through the generations. Stability can be biologically progressive only when it means the perpetuation of the prized human goals, values and achievements for the future generations, while at the same time is compatible with the continuous production of new ideas, goals and values from gifted, even aberrant individuals.

Qualitative Changes in Evolution and Environmental Control

At the psycho-social level both the organism and the environment, both human nature and society, progressively evolve in relation to each other not only along a direction indicating quantitative changes of attributes, but into ever new qualities, values and experiences. The emergences of life, man and mind were themselves successive qualitative changes in the course of evolution which must continue, if life is to continue. Human nature must, accordingly, catch up with the qualitative changes caused by the dynamic reciprocal adjustments of man, behaviour and environment in the on-going process of life.

This is not an extrapolation of human ideas, wishes and values into evolution, but a trend of the more general progress of life itself. Such trend involves progress in adaptation and in control by each individual species of the environment towards its improvement for its long-term goals on one side; and the increase of both the diversity of species and the orderliness, harmony and solidarity of the organisation of life as a whole on the other. In the new context of human social evolution, environmental control includes, first, the conservation and improvement of natural resources and possibilities for the ends and values of the population in the long periods of time. Control of the environment includes, secondly, peace and amity between man and fellow-man, and between group and group within each culture, and the organisation of mankind-as-a whole. Thus man evolves by achieving an increasing harmony with both his living environment—his fellowmen extending into the earth-community—and his non-living environment including the cosmos as he can comprehend and appreciate it.

For the biological progress of man his environmental control oversteps his objective mastery of the external environment that provides the material basis of his advance. It achieves the deflection of his energy and resources from the goals of mere survival and reproduction to the creation, fulfilment and dissemination of higher intrinsic values and satisfactions with the increasing realisation of human potentialities. This alters the entire dimension on which evolution occurs. With the supremacy of mind in evolution, the really significant increase of control and autonomy of man, rooted in the advance of knowledge and depth and intensity of feeling, will be seen to be associated with his intrinsic, transcendent values and experiences—his control and direction of abstract concepts to yield the truths of the cosmos, of sounds, forms and colours to give him experiences of beauty, rhythm and symmetry in the cosmos, and his transcendence of both his external conditions and mental states to give mystical exaltation and ecstasy i.e. identification with the cosmos. At the stage of human social evolution where mind and values predominate, the qualitative improvement of levels or dimensions of adaptation and control and improvement of environment are involved in the biological necessities. Human fitness is not for mere

survival and reproduction, but for the fulfilment of an increasingly higher range of goals, values and satisfactions. Yet we can still speak of these as the natural consequences of evolutionary principles.

Biological versus Higher Needs and Values in Human Evolution

Man evolves not only by the natural selection of his organic traits and dispositions, but also by the conscious selection and transmission of his traditions, goals and values that comprise the acquired medium in which the new pattern of evolution is operative. His fundamental drives of sexual impulse, tenderness and cooperativeness lead him to enlarging ambits of love, altruism and sacrifice. His aggressiveness seeks fulfilment in struggle with, and mastery over, environmental coercions and dangers common to fellow-men. His acquisitive competition leads to improvement in efficiency in the production and distribution of wealth and services and to increase in expenditure of energy and resources for the satisfaction of the higher intrinsic needs and values transcending the needs and values of biological survival. Thus the elementary propensities of sex, aggressiveness and acquisitiveness that maintain severe and unrestricted struggle and competition at the animal level are now moulded and deflected through displacement, repression, transfer or sublimation by new human goals, values and fulfilments. The evolution of a complex human psyche, revolving round the family organisation, results in fostering affection, passivity and cooperativeness and checking animal rage, pugnacity and aggressiveness. Without the intimate and intelligent mental interchange within the family, between male and female, parents and offspring, man would not have been human. The key to man's humanity is provided by the milieu of the family welded by human monogamous mating, and care and solicitude for the young. It is the family which develops not only wits, speech and tools but also tender emotions and sentiments, fashions a human nature and communi cates a human tradition.

Psycho-social selection gives a premium to the tender and altruistic interpersonal components that spread through the processes of learning and social communication and transmission from the family to the community, nation and mankind-as-a whole. It promotes the redirection of fundamental drives along socially constructive channels that lead to the cumulative enrichment and variegation of individual productive traits, capacities and values. It, accordingly, limits the law of natural selection and survival in all possible directions, and constantly and synergestically enlarges its operations through the moulding influences on the individual and through the accumulation and transmission of acquired traditions, goals and values across successive generations.

Modification of Human Nature and the Code of the Jungle

Man's improved mastery over his environment through his science and technology that frees his time, energy and skill more and more from

procuring means of subsistence, struggle and survival, his eradication of suffering and pain and control of diseases, accidents and perils of life, his improvement of the conditions of comfort, leisure and happiness for himself and for his progeny, and his rational, long-range, peaceful methods of resolution of conflicts of individuals, groups and nations are all evolutionary transformations not less significant than the changes in his biologic sexual, aggressive and acquisitive dispositions and behaviour. The former social-evolutionary transformations are registered in his external social heritage that makes it increasingly possible for him to qualitatively improve both his own nature, understandings, needs, values and experiences and his ever-widening psycho-social environment in which he lives and thrives. It is the extra-organic psycho-social heredity, the cumulative expansion, inheritance and transmission of knowledge, learning and morality, peculiar to the human species, which, to be sure, comprise its means of control and purposive direction of biological evolution, with its processes of struggle, coercion and mere survival, and of actualisation of human potentialities for the insights, values and experiences that make the human animal man in spite of his biological ancestry. The psycho-social inheritance of man in his generations ever achieving greater convergence, wider extension and better equilibration and ever replacing competition, conflict and violence in the raw completely transforms the pattern of biological evolution.

The new psycho-social evolution gains in momentum and power as it increasingly enlarges its ambit, and brings within it more and more peoples, cultures and economic and social systems, as it becomes global in its scope. Then can it more consciously and effectively modify and reduce the scope of the old biological evolution rooted in force and cunning, and the law of tooth-and-claw and its derivative, the law of the eye for an eye and the tooth for a tooth in early and less mature human civilization. The mitigation, limitation or abolition of the code of the jungle proceed with the extension of civilized mankind's legacy of culture, learning and morals worked out in the social structures and values of different peoples not through intra-species struggle but through intra-species thinking and consecration. Today the new psycho-social evolution dominates the old animal evolution only, however, in the minds and hearts of the world's elite, and not of the mass of the world population. But science, technology, art, religion and morals, all have in the course of man's social development first sprung from small minorities, and then are gradually diffused and transmitted to embrace the world's population. The decision of the intellectual minorities of the world to unite and their definition of the right direction of social evolution for humanity at large, still under the influence of competition and natural selection only, are fateful for the future evolution of the species.

Global Intra-species Co-operation

Civilized man now does broadly utilize and manipulate the common cultural legacy of the species as a whole, and is more and more learning how to do so for the purposes of circumscribing, controlling and directing the processes of biological competition, struggle and selection. This is nothing more and nothing less than the extrapolation of the social meaning and moral purpose into the old biological evolution, making it less of the unmeaning, planless, materialistic process of which he has been the product. Psycho-social evolution is essentially directive, purposive and ethical, and advances on the basis of the qualitative improvement of the human person and the growth and diffusion of mankind's common pool of knowledge, morals and culture from which are derived the judgments about persons, values and institutions in particular cultures.

Man's intellectual, social and moral attributes, capacities and strivings and his common global traditions have no doubt arisen by biological evolution, but these are no longer defined by it. These have lifted his evolution to another dimension altogether—the dimension of conscious moral choice and cultural direction on a global scale. His fundamental evolutionary advance, which is trans-biological and global, rests on the increasing replacement of natural selection by conscious selection of ideas, values and institutions, and this over the entire planet. The factors of the growth of new ideas and values, their easy preservation, communication and transmission and the natural selective pressure for and against these in different cultures are, therefore, of the greatest significance for human evolution. In human culture the random mutations of new ideas and values, and their linkages and recombinations in the pool of social heredity are far more frequent and propagated far more quickly, leading to spurts of social evolutionary advance. At the same time the social genetic system, like the biological one, is resistant to the assimilation of an acquired character that arises out of environmental stresses. The evolution of mind and values and of social heredity and the control and direction of the environment greatly circumscribe the scope of natural selection in human progress in spite of the fact that the mechanisms of the old biological evolution viz., intra-species struggle and sanguinary warfare have not been superseded by the new mechanisms of human social evolution viz., intra-species conceptual understanding, value judgment and conscious cooperation. Yet the parallelisms between the human and animal evolutionary system are quite close.[1] Although the planned control and direction of social evolution remain indirect and inchoate there is no doubt these involve mankind's biological and moral imperative of the control and ultimate abolition of war that has been the major obstacle to its progress in a long and chequered history and now threatens its very survival.

[1] Waddington : Evolutionary System—Animal and Human, *Nature*, 1959; Darlington : The Control of Evolution in Man, *Nature*, 1958.

War, a Crime and a Perversion

War is at once a biological crime and a psycho-social perversion. It retards man's advance as much through large-scale killings of the best and the noblest stratum in the population as through rending asunder the close-knit fabric of intellectual and moral traditions and values that truly constitute the common human heritage and acts as a sieve of conscious human selection and advance. It deflects the hard-won acquisitions of his skill, knowledge and technology into the channels of mutual rivalry and destruction, rehabilitating the crude and old mechanisms of natural selection by brute force that he has largely outgrown in his evolution. It blocks the trend of potentialities of the human person, society and culture. The give-and-take between a war-like, belligerent society and the socially conditioned pugnacious individual distorts normal mental growth and social integration, and impoverishes the system of values and culture. Unless the clumsy and indiscriminate mechanism of sifting that warfare represents is completely superseded by the pacific, wholesome and rational sifting towards the good, just and humane person and social relations, mankind cannot move forward towards optimum richness and depth of living and experience. That is human evolution in the proper track. War, to be sure, is a flagrant and wholesale denial of values and style of living that go to the making and maturation of normal personality, society and values. Yet mankind so far has entered with deliberation and in terms of long-range efficiency into an excited and irrational adventure that most animals shun, and that it alone knows, leads to its all-round retrogression.

Disharmony Between Old and New Mechanisms of Human Evolution

The struggle for existence in human history, i.e. the human sector of evolution, has manifested itself in a contrasted manner, in both ruthless internecine war and genocide, and silent rivalry and struggle between ideas, values, mentifacts, artifacts and social institutions since the dawn of *Homo sapiens*. Man's ancestral stock branched off from the rest of the anthropoids ten to twenty million years ago, and *Homo sapiens* emerged on this planet about five hundred to one hundred thousand years ago. The period from the beginning of human history to the present epoch is about six thousand years or three hundred generations which may be too short to permit a perceptible evolution of his brain and mind. His improved knowledge, memory, imagination and judgment of the consequences of his actions have eschewed neither aggressiveness and brutality nor irrational, ego-centric enjoyment. Nor have his enlarged capacity for formal education and rich and complex social and intellectual heritage assured adequate control over his instinctual rage, greed, hate and other dispositions and impulses harking back to his animal origins. A good many of his inherited impulses and extravagant and unwholesome pleasures stand in the way of development of the higher needs, values and gratifications, while depen-

dence on mere physical strength and endurance is incompatible with his newly evolved and elaborated mechanisms of control, improvement and transformation of the environment. The external social heritage, which arises out of the interchange of unconscious, organic and conscious social factors, without any determinate relation to his extremely complex and viable needs, values and strivings, and which constitutes the fundamental basis of his new evolution, has also proved inflexible and circumscribed, and as a guide to his evolutionary advance, unreliable. It can neither spread instantaneously, nor combat his elemental drives successfully nor, again, translate his reason, intelligence and imagination into social action effectively at any given moment. Because of the very circumstance that it is in part created, moulded and transmitted by human reason and volition, and in part by instincts, habits and emotions, it may be considerably distorted and channelized in the directions of the use of force and cunning, domination and natural selection—all typical elements in the old biological evolution. A lop-sided, sinister and sanguinary social tradition and organisation, indeed, can and does strongly warp man's needs, sentiments, judgments and values and checkmate his psycho-social evolution.

Human Evolution, Still an Open Question

Man cannot as yet make sure that his psycho-social evolution is bound to occur without deviations, set-backs and back-slidings, even though he has discerned the biological penalty of these latter. Biologically speaking, his evolution still remains an *open* question. Psychologically speaking, he alone among the animals can make the fateful choice of influencing his own further evolution or extinction. This psychological decision is certainly urgent in the Atomic Age but not at all easy, due to the peculiarities of development of his brain and nervous organisation, resulting in a dominance of his instinctual drives, feelings and emotions over his intelligence and directiveness. His mental development shows a serious lop-sidedness towards inadequate inhibition of his aggressive and destructive impulses and irrational satisfactions that now after six thousand years of his culture threatens his doom. Weidenreich finds that the human brain-case attained its greatest evolutionary expansion during the Neanderthal phase and has undergone a distinct diminution since. The brain of Neanderthal man is not more globular than that of modern, but distinctly less so.[1] The slight reduction of brain size and increase in globularity of the brain of emergent man have aggravated the disbalance between the intensity of impulses and emotions embodied in the resurgent aggressiveness and oral capacity of the tool and weapon-making, predatory man and their rational inhibition and restraint. Aggressiveness with the concomitant emotions of anger and rage had, no doubt, its survival value for the hominid whose dietetic predilection and adoption of hunting life exposed him to excessive risk

[1] *Apes, Giants and Men.*

and conflict. The momentous behavioural shift from the defensive and retreating pattern of the arboreal ape to the hunting, attacking pattern of the terrestrial human carnivore favours a level of aggressiveness and destructiveness as adaptive and essential for his survival. Human sexuality involves also elements of aggression as evident in sadism and masochism, and there is no doubt that humans show a stronger and more constant sexual propensity than apes and monkeys. According to Deutsch aggressive drives are especially intensified in humans during menstruation. There is, indeed, somec linical evidence to the effect that aggressiveness in man, whether connected with his sexual dispositions or not, exists as a part of his genetic equipment. His hereditary endowment of aggressive and destructive impulses has now obviously become a psycho-biological handicap for his advance. Inadequately repressed and inhibited, these impulses get the better of his reason, judgment and directiveness. Neither his improving intelligence nor the feelings and sentiments of love, tenderness and altruism, stimulated in his enlarged communities, can adequately check his aggressive propensity and response. The least provocation due to hunger, frustration, deprivation of love, pain or punishment provokes in man strong and dangerous aggressive reactions. In his mental evolution the excessive development of reason and intelligence accompanies a relatively insufficient restraint of aggressiveness, destructiveness and sexual impulse that now constitute a serious biological handicap for his further advance.

The Imbalance between Human Intelligence and Instincts

There has been, no doubt, a marked increase of intelligence, skill and knowledge from the Neanderthal hunter and the Aurignacian cave-dweller to Plato, Leonardo da Vinci, Sankara and Einstein. But there has been no corresponding gain in love, sensitiveness and compassion since the Buddha, Confucius, Socrates and Jesus. Man's emotional and moral immaturity is attached to his colossal and distorted intelligence and technological skill. An exaggeration of the intellectual faculty with inadequate control of impulses and emotions, and deficient intuitive appreciation of the higher goals and values of life, accounts for ever-increasing pugnacity, greed and lust for power in human development. This warps and distorts the channelling and expression even of his normal desires. At the same time, due to the relative under-development of his social sentiment and of aesthetic and spiritual intuition, with associated inward detachment, exaltation and ecstasy, large vistas of experience and fields of endeavour that cannot be thrown open merely by sharp intelligence and reason are excluded.

Man has to wage a dual struggle for his survival: first, against his hereditary sexuality, rage and aggressiveness that have become bio-psychological misfits; and, second, against the excesses, aberrations and deviations of high intelligence that has overshot its mark and hampers social integration

through excessive avarice, ambition and desire for fame, status and domination. Both personal deterioration and social disorganisation, indeed, follow from the inadequacies of love and the "vices" of intelligence. The corrective is, of course, the growth and nurture of expansive, self-transcending, other-regarding emotions and aesthetic and mystical intuitions. These can effectively restrain egoism, aggressiveness, callousness and lust for domination, and positively enlarge and deepen human sympathies and the expressions of human creativity and productiveness. Man can truly surpass himself not with the excessive intelligence of a Pythagoras, a Bacon and a Descartes but with the intuition of a Buddha, a Confucius and a Jesus. The fate of *Homo sapiens* largely depends on the supremacy of the altruistic, aesthetic and spiritual values and experiences over the norms and standards of cold, arid intellectualism.

Causes and Consequences of Hyper-Cortical Activity

Max Scheler long ago pointed out that one of the most significant ways in which the hypertrophy of intellect is proving a hindrance to man's total advance is his loss of capacity for "specialised identification with fellow-beings, characteristic of most animals."[1] Like children, mystics and poets and also several types of neurotics show a greater capacity for sensory "eidetic imagery" than normal persons. This is associated with their greater rapport that extends beyond perception, and enhances the meaning and value of fellow-beings in much larger measure than we associate with normal human feeling and experience. He mentions the pioneer work of Jaensch to the effect that sensory "eidetic imagery" which the average adult has lost and which is still present in children, is a mid-way stage between perception and ideation, out of which the distinction between them seems first to be developed. According to Allport, the true function of the eidetic image is discernible only in childhood when by preserving and elaborating sensory data it enhances the meaning of the stimulus situation for the child and enables him to perfect his adaptive responses.[2] The loss or reduction of capacity for sensory "eidetic imagery" is linked with the diminution of love, sympathy and sensitiveness towards fellowman, and this is noticeable even from childhood. The entire meaning of the man-with-man situation and the corresponding behaviour accordingly suffer.

For an adequate explanation of the above we have to go to neurologists. There is a remarkable disparity between the excessive growth and elaboration of man's cerebral cortex and the relatively inadequate development of that part of the brain and the nervous system concerned with his emotional drives. The latter are mainly glandular, and are not under complete control of conscious direction. Man's roof-brain which stands for knowledge

[1] *The Nature of Sympathy*, p. 31.
[2] Eidetic Imagery, *British Journal of Psychology*, XV.

and reason, and which is uniquely human and relatively new in animal evolution, can govern, as Sherrington shows, his old brain of "affect." But the former has developed to be a hundred times the greater of the latter. To the latter region pertain the bodily phenomena of affect. Also from it, according to Sherrington, issue nerve-paths up to the great roof-brain which correlate with mind.[1] The hypothalamus, lying near the centre of the head, is also an area connected with the emotional life with nerve fibres conducting impulses in both directions. According to Young, it establishes the general attitude or direction of much of brain action—the emotional tone. But "such condition as aggressiveness or irritability though both influence and can be controlled by intellectual life are partly independent of it."[2] Machean holds that while the neocortex which has shown a great proliferative expansion in man and is the mediator of his specialized discriminating and abstracting intellectual activity, his emotional behaviour continues to be under the dominance of a system which lacks abilities for specific discrimination, for verbal or symbolic capacity or for self-awareness. He calls this "visceral brain" that is derived mainly from the old rhinencephalon dominant in more primitive animal forms.[3] Apparently the "visceral brain" is deficient in the capacities of inhibition and control of man's life of impulses and emotions through discrimination, abstraction and symbolisation. Freedman and Roe have suggested that man's prolonged development and delayed maturity are responsible for the persistence of an archaic neurological and endocrinological system partially but not completely under cortical control. They observe: "Retardation inexorably creates a social man, dependent on his social skills and dependent too on a complicated system of symbolic communication based on his superior brain, for survival. Built into this subtle, symbolic, social organism is the affective mechanism of the archipallium, and the endocrine and autonomic systems geared to more primitive stimulus patterns and to kinesthetic and visceral responses."[4] It is suggested by Whyte that due to the discontinuity between cortical and glandular processes man acts impulsively and emotionally, apart from the exercise of his reason and judgment. He reflects, speaks and behaves apart from his elemental instincts and dispositions.[5] The dominant emotions, sex, rage and fear, may function rebelliously, not integrally in terms of the complete situation. Bertalanffy also considers that human progress is a purely intellectual affair made possible by the enormous development of the fore-brain, with no commensurate development on the instinctual side.[6] There are, no doubt, discontinuity

[1] Sherrington: *Man on His Nature*, pp. 232-233.
[2] J.Z. Young: *Doubt and Certainty in Science*, p. 54.
[3] Paul Machean: Psychosomatic Disease and the Visceral Brain, *Psychosomatic Medicine*, II, 328-353.
[4] Evolution and Human Behaviour, pp. 460-461, in *Behaviour and Evolution*. (Ed.: Roe and Simpson).
[5] *Accent on Form*, pp. 132-133.
[6] A Biologist Looks at Human Nature, *The Scientific Monthly*, Vol. 82, 1956.

and imbalance between man's hyper-cortical activity and instinctive behaviour which have a neurological basis. Many of man's hereditary instincts and dispositions such as those of the proverbial ape and tiger and, we may add, of the donkey, and his lower instinctive satisfactions obviously stand in the way of his higher emotions, aspirations and values and fuller social integration and living, and hence of his total evolution.

The Qualitative Improvement of the Human Mind

Man's excessive hereditary endowments of egoism, aggressiveness, anger and greed, the discontinuity between his reflective and instinctive behaviour in his mental development, and his automatic physical strength and prowess are acquisitions of an organic order during the millions of years when he had to hunt or breed other animals in order to kill them for food instead of growing food, and hardly developed extra-corporal sources of power to supplement or supersede his muscles. Civilized man today shows in all regions a progressive refinement of the physiognomy, with diminution of the protrusion and size of the cheek bones, lessening of the size and massiveness of the jaws and teeth, and more generalised beauty.[1] There is a trend towards the globular head, large and high forehead, high brows, narrow noses and prominent chins bringing about a marked refinement of the face and towards tallness and slenderness of the body with longer legs and shorter arms. Many of these changes, which have already become more or less hereditary, are linked with the new mechanisms of human environmental control and improvement.

Biological and Psychological Forecasts of Man

J. B. S. Haldane's biological forecast of man is this : "In the last million years man has become more cerebral, more neotenic and more polymorphic. We should expect our remote descendents to have an appearance that we should describe today as childish. We should expect their physiological, intellectual and emotional development to be slower than our own (neoteny). We should not expect them to be born with an overpowering urge to any particular kind of conduct, good or bad (polymorphism). It is probable that these are desirable evolutionary trends while judgment should be reserved concerning polytypicism and sexual dimorphism."[2] To this we may add a psychological forecast. Man in the future will grow much more tardily, both physically and mentally. A larger and more complex brain, more intelligence, insight and appreciation, a more extended childhood and youth and greater longevity will all be linked with one another. The increased span of life will lead to an extension of the period of education necessary due to the increase and complexity of information

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[1] See Ales Hrdlicka : The Problem of Human Evolution in Anshen (Ed.) : *Science and Man*, p. 36; also Mckinley : *Evolution : The Ages and Tommorrow*, p. 240.

[2] Haldane : Human Evolution : Past and Future, in Whit Barnett (Ed.) : *This is My Philosophy*.

which man must acquire to live efficiently and adequately in modern civilization. This will lead to both a qualitative improvement and quantitative variegation of human talents and capacities. Man will continue to learn till maturity and live for many more decades, having much richer interests, values and achievements to his credit. His muscular power will greatly diminish as his more prodigious extra-corporeal power, derived from nature and improved scientific and technological skill and resources, will give him far greater capacity to control, improve and transform the environment. He will show a much wider range of cognitions, feelings and tastes and variety of values and behaviour patterns than modern man. Since he will probably belong to a mixed racial blend he will be freer from current race and colour prejudices and will exhibit a higher mental plasticity and variability, constituting the foundation of richer human values and potentialities.

Less and less will the man of the future cling to his animal past and more and more will his life, values and achievements be focussed at higher than the animal dimension turning away from food, sex, shelter, fight and manual toil. His life will be more full of novelty, adventure and enterprise in unknown and unexplored realms—space travel to which his body and mind are not yet adapted will be an instance—that will resolve many inner tensions and conflicts due to frustration. In conformity with the trend of mental evolution, he will reveal a marked combination of sensitivity and emotional detachment with higher imagination and intuition and capacity for sustained abstract reasoning and contemplation. He will be far less impelled by the instinctual drives and emotions, by sex, rage, greed, fear and anxiety, and by crowd and mass psychology. Not merely an increase in the length of education but an improvement of its quality and dimension, with the aid of psychology and psychiatry, will eliminate his anxiety and conflict, frustration and aggression, and make him much happier, more efficient, more compassionate and more wholesome. Productiveness, adventurousness and joy, linked with greater empathy of the individual, will add a new warmth and intimacy to collective life. The differences between one individual and another will be magnified. But the improvement of human novelty and diversity, and of the heights the unusual giants of the future will reach, will be accompanied by a greater sense of justice, goodness and love. The latter will be far different from the pattern of standardized sociability into which the children of the present generation are forced. It is the enrichment and refinement of the intrinsic values which will determine the average human quality and hence the future of mankind.

Endless Reciprocity between Changing Human Nature and Environment

Man in the future will, no doubt, be much more rational and intelligent in his judgment about himself, society and cosmos. His knowledge and comprehension of cosmos will far exceed the bounds of scientific

and philosophical imagination of the present. But it is not only, and even largely in the clarity, depth and sweep of his knowledge or in the speed of its acquisition and transmission that he will surpass present day man. For he will create beauty, love and goodness much beyond what we can imagine at present. He will manifest greater aesthetic appreciation, social empathy and mystical exaltation and will be dependent for his intuitions, motivations and values on a more adequate man-and-cosmos orientation. In mind and mind, and mind and cosmos transactions new horizons will be opened out for our descendents calling for dramatic readjustment of human relations and behaviour. This will veritably produce a kind of human nature and human values far different from our own. Altruism will surely and increasingly take the place of egoism,l oyalty of prudence, reverence of equality and justice, and all-embracing love, sharing and philanthropy of limited devotions and loyalties to the family, the class, the community and the nation. Pan-human charity, fellowship, compassion and reverence will have much more extended fields of application in the future social organisation than we can envisage today. Telepathic communication and feeling and para-psychological intimacy will be more widely encountered, representing a new dimension of human sensitiveness and emotions of love and self-transcendence. The Buddha, Confucius, Socrates, Christ, Bodhidharma, St. Francis and Chaitanya of the future, with their unbounded love and compassion for the lowest and the least in society, and their vast reverence for life, will far eclipse the historic figures, and the difference between the common man and these exceptional men of empathy and goodness will be far less pronounced in the future than at present. The cycle of reciprocities between the changing human nature and the changing challenge of the social environment will yield for our posterity a spiral of transformations, the components of which do not even exist in the present generation. Finally, a more intelligent eugenic policy and discriminating sexual selection will establish the superior emerging intellectual and moral attributes as more or less hereditary and among larger numbers of individuals in the community, stock or race in the future. Geneticists anticipate a road to practical eugenics via artificial insemination. Bentley Glass suggests that someday defective human genes may be mixed in the laboratory with healthy genetic material in order to produce normal individuals or that the sex of children may be preordered by a device that electrically separates the two types of sperm. There is some evidence for pre-natal influence by means of the mother's adrenal-cortisone state that suggests hope for changing or controlling the qualities of children at birth.[1]

The Future of Man

Several biologists also think of the possibilities of using certain special

[1] Brosin : Diseases of the Mind in Sol Tax (Ed.) : *The Evolution of Man*, p. 403.

hormones or other chemical products to reinforce man's intelligence and to dispose him to altruism. Certain stimulating or psychogenic drugs are already used to enable mice to find their way about more easily in a maze. These have also been found effective in certain cases of mental backwardness, certain missing hormones can also artificially stimulate the mental activities of idiots. "Thought," observes Carrel, "is the daughter of the internal secretions just as much as of the cerebral cortex," and he adds that the Christian virtues are harder to practise when the endocrine glands are defective. The French biologists Jean Rostand thinks that "super-humanising modifications" can be brought about by chemical dosing. Certain female hormones excite the maternal instinct, tenderness and compassion. "The future," says he, "may bring the use of medicines that would favour social behaviour, kindness and devotion." He mentions the possibilities of DNA (desoxyribose nucleic acid) injections and anticipates a time "when each human infant could receive a standard DNA that would confer the most desirable physical and intellectual characteristics. Such children will not be the offspring of a particular couple but of the entire species."[1] He also discusses the possibility of influencing character through the diet, and quotes Dr. Laumoiner who suggests curing jealousy with milk, anger with fruit, pride with vegetables, vanity with laxatives and avarice with nux vomica.[2] Aldous Huxley appreciating the recent rapid growth of pharmocology and the use of hallucinogens and tranquilizers whose physiological price is exceedingly low considers that pharmocologists will in the next few years be able to give man joy, peace, sense of beauty and loving kindness. Such a gift will not exact the terrible price that he has paid so far for resorting to such consciousness-changing drugs as heroin, cocaine and alcohol.[3] He will in future be able to change his consciousness and relieve his tension without also undergoing any strenuous self-control and spiritual exercises that are now regarded as indispensable and that can only be successfully undertaken by the gifted few.

The advancing knowledge of biology, ecology, genetics, ethology, endrocrinology and chemistry holds out excellent promises of possible alterations in human body and mind for adapting them better by directed mutation to a less conflictful, fuller and happier life in future. If the above natural sciences are rich with possibilities for the production of healthy and well-integrated human offspring, for clinical interference with man's genetic development, and for improvement of his physical and intellectual qualities, the human behavioural sciences, especially child psychology, psychiatry and social psychology, have their profound impacts on the improvement of human relationships and values. The child's development,

[1] Quoted in Brosin: Diseases of the Mind in Sol Tax (Ed.): *The Evolution of Man*, p. 402.

[2] *Can Man be Modified*, pp. 79-81.

[3] History of Tension, *The Scientific Monthly*, July 1957.

physically, intellectually and socially, will be enormously aided in the future by the improvement of mother-child relations in the first years of life and of child-rearing practices. Psychiatric methods and techniques today correct or modify even genetic defects and handicaps not amenable to direct methods. More and more the behavioural sciences reject what Jennings calls "the fallacy that showing a characteristic to be hereditary proves that it is not alterable by environment." The profounder insights of modern psychology, psychiatry and education into the roles of human self-cognition, self-valuation and self-transcendence and the functioning of communication system in social groups comprise the ingredients upon which to build a unified science and art of human fulfilment that are awaiting a Darwin or an Einstein. These will increasingly safeguard future man from unwholesomeness, unhappiness and unfulfilment. That human nature and values are both determinants and products of evolution is now accepted as a legitimate hypothesis of the behavioural sciences. Human evolution occurs on the basis of a silent, ceaseless, fruitful interchange between changing mind and values and changing pattern of the environment. As it proceeds it becomes more conscious, meaningful, purposeful and moral. Knowledge, beauty and love increasingly direct the goal and accelerate the tempo of human evolution. Human evolution, with values, creativity, sensitiveness and transcendence as its expressions, has unknown possibilities.

CHAPTER X

OPEN AND TRANSCENDENT EVOLUTION : VALUES AS LAWS AND DIRECTIVES OF HUMAN EVOLUTION

The Principle of Transcendence in Evolution

The emergence of consciousness in cosmos introduces goal-seeking into the patterns of adaptation and evolution. With mental evolution and the emergence of values and ideals, evolution enters into its highest phase—that of conscious control, integralness and transcendence. The more intelligent animal has its directiveness, and sometimes also its purposiveness of adaptation and evolution. This trend of directiveness and purposiveness culminates itself in man's conscious and self-transcending value-seeking and value-experience. His insights, values and ideals increasingly control and direct evolution in all its phases to transcendent dimensions.

Human understanding which leads to new ways of looking at evolution is a product of the whole mind of man and the whole experience of the species, and not merely of the conscious processes of thought and reason. An increasing purposefulness, wholeness and openness characterise evolution as it goes along; and in man's evolution these are the outcome as much of his intellect, memory and foresight as of his intuition, imagination, conscience and faith. By his moral and spiritual strivings towards the unity, wholeness, harmony and transcendence of existence he introduces an ultimate meaning and goal for the first time into organic evolution, and increasingly defines and determines its course that has so far been rigidly circumscribed, incoherent and aimless. The emergence of the unpredictable and undeducible in human nature, attributes and trends is truly speaking, 'transcendence' in cosmic evolution. Human evolution is *par excellence* open, purposeful and transcendent, continuing at a higher dimension the evolutionary trend of matter and life, and achieving an ever deeper and richer unity, wholeness and harmony in the cosmos. To state the same thing in a different manner, due to the exercise of human imagination, faith and hope, the meanings and values of cosmic evolution become open, purposeful and transcendent. Wholeness, openness, purposefulness and transcendence comprise the very essence of primordial Being or Nature, and of the world process which we call Evolution.

Evolution is a constant, on-going, open process, not a consummation. Its endeavour is ever forward-oriented, transcendent. Bio-philosophy aims at understanding the transcendent meaning and function of evolution, embodied in the structures and activities of manifold life-forms of different orders or dimensions. The change and modification, the rise, defeat and

elimination of the complex patterns of life, filling every nook and corner of the environment, obey the transcendent aim. Such a transcendent aim directs the living creature as a whole, not its particular organs and functions. It was Bergson who was the first to stress that the development of such complex sense-organs as the eye and the wing, and of instinct and intelligence cannot be accounted for by the preservation of random variations useful to the animal in the evolutionary change from lower to higher forms. The whole complicated structure of the eye is assembled in the embryo before birth, at a time when it is completely useless functionally. Thus it is being built for the "purpose" of later use, and cannot be subsumed under an analogous operation of feed back and control according to the cybernetic hypothesis.[1] The organism appropriately adapts itself to the environment as a totality through its whole being, the sensitivity of its total responses to it, its exploration of new possibilities of the life situation and its directedness, independence and transcendence of the situation.

Transcendence is the force behind evolution responsible for the occurrence of mutations, whether useful or dangerous, and for the gradual evolutionary progress to higher organisms endowed with consciousness, values and purposes. Man is not at all most appropriately adapted to the environment. But he is the highest being because he can transcend his existential situation and release his emergent values and possibilities more and more.

Man's Adaptation to Undefined Possibilities

All species of life in the face of hindrances, challenges and tensions occupy themselves with the transcending possibilities of the given, circumscribed life-situations. *Homo sapiens* owes his emergence to his ape-like ancestors because in encountering the challenges and frustrations of the grass-lands and meadows when they had come down from the trees, they subjected themselves to broader and less defined possibilities than what the anthropoid stock had ever acknowledged. He could amplify, variegate and refine intelligently the same mode of behaviour-adaptation of his kith and kin, the Homos, oriented anticipatorily and unconsciously towards his undefined possibilities. The brain of *Homo sapiens* is much more flexible and sensitive than that of the apes and Homo.[2] The flexibility and sensitiveness of the human cortex which have been developed for one million years made possible its free use, transcending the immediate biological and social situation, for shaping symbolic forms and patterns of mind and behaviour, sometimes in complete detachment from the environment. The creative and transcendent non-adaptive activities of the human cortex cannot be treated merely as products of natural selection. These rather embody the univer-

[1] See Elsasser, *The Physical Foundation of Biology*, p. 4.

[2] Simpson: *The Meaning of Evolution*; Dobzhansky: *The Biological Basis of Human Freedom*.

sal trend of evolution to develop new patterns beyond the stability of the organism and its well-adapted mode of behaviour and discover new potentials of life and organization. The symbolic life of man must be seen as a continual exploration and transformation of potentialities of his mind, society and environment that provide ever-new challenges for himself. Because of his upright posture, fine, flexible cortex and range of creation of his symbolising mind and values, no other animal is concerned with a more open, comprehensive, indeterminate and transcendent vista of potentialities as he is. In fact he alone can selectively, purp osefully and unpredictably govern and direct his career in the light of the transcendent possibilities of evolution that the cosmos holds out. The cosmos is not only transformed into ingredients of his external heritage of goods and tools, techniques and institutions, but is also *internalised* in his meanings, goals, values and ideals. With each creative effort and transcendence of immediate existents, he also refashions his nature and strivings, and this becomes the basis of further transcendence of the life-situations and possibilities in a spiral of advance.

It is only a naive biologism and psychologism that circumscribe man's goals, values and adjustment within a limited, immediate and specific biological situation. He seeks goals and values that may not be fully realised. It is his strivings, commitments and aspirations for unattainable, intrinsic and transcendent values that confer unity, freedom and wholeness on his personality, and also establish his meaningful, spiritual interchange with existence and cosmos as a whole. The maturation and integration of the human mind and self are linked with self-detachment, self-extension and self-transcendence rather than with self-love, self-assertion and self-actualisation that the current schools of bio-psychology have so far stressed. Transcendent insights, appreciations and exaltations, belonging to those regions of personality that are neglected by psychologists, are reflected in all aesthetic, moral and mystical strivings and experiences.[1] These open out man-and-society and man-and-cosmos transactions or osmoses ever more sensitively, harmoniously and comprehensively in human evolution. Human genetic change as well as social adaptation, working largely through the mechanisms of the language and symbol system, establish a continuous and ever-expanding whole of society, mankind and cosmos as products of conscious, forward-oriented, transcendent faculties. Both human nature and human evolution undergo radical transformation in the totally new type of evolutionary process, due to the accumulation of transcendent ideas, values and experiences that in turn make possible further transcendent adjustment.

In human evolution we have, therefore, to postulate the human mind's

[1] See Maslow : Cognition of Being in the Peak Experiences, *Journal of Genetic Psychology*, 1959.

unpredictable, transcendent dimensions and processes of thought, feeling and experience. The structure and mechanisms of human life and mind have selectively moved in the direction of greater adaptedness and openness through the system of intrinsic and transcendent values and experiences as an integral part of the human heritage. Neither human evolution nor human values can have final forms as long as man and cosmos transactions continue. It is wrong to think of cosmic evolution without the role of human transcendence in its completion and perfection. It is man's imagination and valuation that by constituting more comprehensive, more harmonious and intrinsically better wholes which keep the cosmos on-going in its infinite ranges of space and time. Transcendence of meanings, values and possibilities is inherent in life and mind, and in the things and eventuations of the cosmos which supply the materials on which the former work. What is transcendent and what is existent in evolution belong to the same stuff. The chain of evolution of matter, life and mind is a chain of growing freedom, wholeness and transcendence. Such is the theory of "open" and "transcendent" evolution.

Man's Approximation to the Transcendent Quality of Nature

Evolution expresses itself in each species of life, each individual, each mind, each personality and each value, but is never exhausted by its specific expressions. It transcends while it infuses them all. It has a perfection of range and scope since the cosmos cannot contain any as yet unrealised, incomplete and imperfect forms of life, mind, value or potentials. The manifold forms and appearances of life, mind and value, each with its individual adaptation or mode of fulfilment with different limits and at different levels or dimensions, are all derived from the primordial Being, whence the impulse of the all-pervasive, ramifying, evolutionary process proceeds. The Being may well be conceived as abstract and impersonal, or having something of that unity and individuality which we associate with mind, values and personality. In each case what is the primordial, universal or transcendent cause becomes the immanent essence of finite, living individuals who are at once creatures and creators, products of, and participants in, the life universal. As Whitehead would say, "the existents in Nature share in the nature of the immanent Eternal Being."[1] The potentiality of Being or cosmos is immanent in the actuality of the form and function of life. Both eternal Being or cosmos cherish at heart most the uniqueness, freedom and creativity of life, mind and purpose for all individual forms, sharing in the unrealised, transcendent values and potentialities of cosmos. Of all life that is individuated human life approximates most to the life cosmic, and is most effectively informed, guided,

[1] *Adventures of Ideas*, p. 166; compare Montague: *Great Visions of Philosophy*, pp. 424-426.

restrained and directed by the transcendental quality and purpose of Being or cosmos.

The Human Instinct and Value of Self-Transcendence

It is clear enough that out of his multi-dimensional environment and experiences of adaptation and development, man develops transcending goals, purposes and values. These are synthetic products of life, mind and society, and sustain, elevate, refine and direct human life, relations and processes at all dimensions and in all sectors. There are, therefore, various configurations of goals and values. But inter-relation, coordination, balance, stability and transcendence are their invariable characteristics, appropriate for the sustenance and furtherance of individual and social living in all its range, depth and togetherness.

Values, purposes and norms, integrative, regulative and transcendent, introduce orderliness into man's social universe and give it a continuous history, meaning and sense of destiny.[1] Values are the "laws," instruments and directives of human social evolution guiding its ascent to greater freedom, wholeness and transcendence. Values are differentiated into instrumental and intrinsic, specific and abstract, existential and transcendent values. The instrumental and specific values are those of health, efficiency, wealth, status and security, concrete and realised. The intrinsic, abstract and transcendent values are those of truth, beauty and goodness, ideal and unrealisable. Man has a natural instinct and capacity for self-extension and self-transcendence. These are rooted in the mammalian, and especially anthropoid, disposition for loving care and sacrifice for offspring, and the unique human foresight, memory and imagination, and enable him to over-reach the finite situation and the immediate goal.[2] His mental make-up is such that he alternates between actuality and potentiality, between immediacy and timelessness, between fractionalism and integralness, and between concreteness and universality in his everyday adjustment to the world and its events. He seizes the eternal, integral and transcendent values by reason of their immanence in the temporal, specific and existential. He lives indeed a dual life, partly in the potential, transcendent and future, and partly in the actual, existential and immediate. Yet the two aspects of his essence and existence are fused with each other. An incomplete blend or unresolved conflict between his actuality and potentiality, between his immediate existence and anticipatory transcendence makes the creature whose peculiar instinct and capacity are those of freedom and transcendence, a psycho-biological misfit and failure. Thus does he experience and realise his adaptation and evolution in terms of both

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[1] Mukerjee : *The Social Structure of Values*; Urban : *Fundamentals of Ethics.*
[2] A. M. Montagu : *The Direction of Human Development.*

his own self-transcendence and the essential wholeness and transcendence of each situation and goal beyond itself.

Value-Scale Fundamental in Human Evolution

A "general" theory of human evolution must, accordingly, be rooted in the differentiation and the hierarchy of normal value experience that orders and integrates the patterns of social relations, behaviour and organisation in a stable and consistent manner. All social evolution is a movement from the immediate, specific and instrumental to the intrinsic, universal and transcendent goals and values. The "field" concept of the interaction or "transaction" between Man—Values—and Cosmos stresses human evolution within a unified system, and self-direction towards a specific coordinated unity of structure and activities, towards self-reflective, dynamic balance, organisation and macroscopic orderliness and interpenetration. This is the kernel of the "general laws" of human evolution that seeks to synthesize the problems of wholeness and dimensions of goals, values and norms of behaviour, which organise and integrate social life and guide the individual to a better and richer adaptation to his physical and social environment and a fuller realisation of his potentialities. In social evolution the development and perfection of the individual become identified with the general progress of society and humanity, and this in terms of intrinsic values and norms exercised in reflective direction and control of human progress. The elevation and refinement of motivation, goals and values means the qualitative advance of man and civilization to an extent unrealised today; while their debasement quickly leads to their degradation and destruction.

The emergence of mind and predominance of conceptual thought, valuation and reflective, purposive behaviour have entirely altered the criteria and mechanisms of biological progress. To evolution as it reaches the human level are now added the criteria and norms of development of mind, values and society. Man's improvement of adaptation and control over the environment consist in the creation, realisation and transmission of his intellectual, aesthetic and spiritual values, both as individual and as species. His independence of the environment is judged with reference to his choice and fulfilment of intrinsic and transcendent values, his self-competence, freedom, poise and wholeness, and his at-homeness with mankind and cosmos as wholes.

Humanity sets up a "natural" scale or hierarchy of goals and values, and true human evolution must be directed to the fulfilment of goals and values in relation to a well-established pan-human scale—the priority of intrinsic, universal and transcendent to instrumental, operational and specific values, of social and spiritual to biological and economic ends and purposes. Such a natural gradation of ends and values of individuals and societies, to which the history of human civilization bears general testi-

mony, is the very essence of human adaptation in different levels and dimensions of environment, biological, social and ideal.

The scaling of values, reflected upon, clarified and approved by social judgment, and cumulatively strengthened and transmitted as ethical tradition, is registered in the moral order of society and in the unity of personality. Values and value-orientation carry with them the resources and responsibility of the moral individual for right choice and social action, and for communicating and embodying these in the ethical principles and norms of the social order.

Evolutionary Transcendence versus *Evolutionary Naturalism*

As new modes of mastery and improvement of the environment, physical, moral and cultural, emerge as a result of communication and dissemination of symbols—devices of pure intellectual construction, modes of aesthetic apprehension, expressions of moral judgment and revelations of mystical self-transcendence—the mechanisms operative in pre-human evolution are entirely changed. The acquired social and moral environment of man becomes the focus and reservoir of all the evolutionary processes of the past working through the present into the unrealised, unpredictable future. The individual's memory, foresight, imagination, conscience and faith are all aided by the cultural tradition as he seeks to transcend himself and fulfil new possibilities. Evolution in man is far less change in the pool of his genes, and far more a change of his complex, acquired cultural environment which effectively transmits the techniques, ideas, habits, values and experiences of the past to the present and future generations for the achievement of new human potentialities.

The aim, direction and processes of evolution are all transformed. It will be more appropriate to say that mind, personality and values entirely change the dimension on which evolution occurs. Man has become the agent and trustee of open and "transcendent" evolution. This is tantamount to the replacement of Evolutionary "Naturalism" by Evolutionary Transcendence, and rejects what Whitehead has characterised as "the bifurcation of nature." Man's evolutionary goals achieve emergent, unrealised, unpredictable potentials of, and for his own nature, and include the qualities of the cosmos-as-a whole as an essential part of his own development.

The current natural science theory of human evolution, as yielded by the biological, psychological and social disciplines, eschews all considerations of goals and values. It ignores not only the basic hierarchy of human needs, goals and values but also the triple dimensions or orders of human environment and adaptation with corresponding differences between the instrumental and proximate values, dealt with by the various social sciences, and the intrinsic, transcendent and ultimate values with which religion, education and morals are concerned. The distinction between the instrumental values of sustenance, status, wealth, power and security, accepted

as the goals of the social sciences, and the intrinsic, transcendent and ultimate values of truth, beauty and goodness and of personality has now become crucial for human survival itself. The complete exclusion of values from the picture of human evolution is largely the outcome of the "scientism" and profound distrust of values and valuations among all social sciences that, truly speaking, are all trans-empirical.

Social Evolution, a Process of Value Creation and Communication

Obviously in the give-and-take between man and his environment, comprising various dimensions or orders, it is the biological goals of the human animal that are transformed into values. Values represent stable patterns of behaviour-adaptation, and at the same time constantly explore new human situations and possibilities. These arrange themselves according to a "natural" scale corresponding to the dimensions or orders of human mind, environment and behaviour. At the same time these spring from, and direct the whole mind, and guide the total behaviour-adaptation to the environment-as-a whole. The unity of man's mind is reflected in the evolution of a unified value system, that, however, like mind itself, constantly discovers new relations, new wholes and new transcendences.

Whitehead observes: "Values require each other. The essential character of the world of value is coordination. Its activity consists in the approach to multiplicity by the adjustment of its many potentialities into finite unities, each unity with a group of dominant ideas of values, mutually interwoven, and reducing the infinity of values into a graduated perspective, fading into complete exclusion."[1] The scheme of values presents itself to man's developing mind and behaviour as a universal, hyper-personal scale, gradation or hierarchy. By participation in values and value-coordination, he achieves peace, security and dignity within himself, and at the same time guides and directs the course of his evolution to its essential destiny. Values and value hierarchy build up groups, institutions, societies and civilizations, and integrate and order social relations, statuses and roles that become themselves seats of existential and transcendent values. These mould the ideal or transcendent dimensions of the personality and the range and depth of human civilization, governing the entire forward-oriented career of the human species.

The process of social evolution is essentially one of creation, learning and communication of values and value-orientation and of the social techniques and means of achieving them. Such achievement confers status, prestige and privilege on the individual from the social side, and self-esteem and dignity from the psychological side. Value-seeking and value-fulfilment pave the way for the creation of more values and higher values. On the other hand, denial or failure to achieve the major values prized by society implies not only loss of social status but also personal disorganisa-

[1] *The Philosophy of Alfred North Whitehead*, pp. 692-693.

tion. Man constantly modifies the acquired values, and learns and also transforms the means of acquiring them. There is a constant interchange between the value-seeking person, the constellation of values and the configuration of groups and institutions that are both foci and aids to the evaluating person in the fulfilment of values. Ultimately all values are judged in terms of their intrinsic or instrumental, existential or transcendent character.

The Genesis of Value-Hierarchy in Human Evolution

A "natural" division between intrinsic and instrumental values, between transcendent and existential values arises due to a dichotomy in human mind and evolution. Man's apprehension and control of the environment operate on a dual basis: first, the development and manipulation of *specific* images, interests and values for facilitating and directing knowledge and experiences of separate events; and, second, of *unified* images, interests and values as wholes or continuums of events, not in their discrete singleness as in the former case but in their collective integralness and transcendence. Psychologically constituted as he is, he wants to understand and appreciate his world both in separate singleness and as whole. This recurrent alteration in the trend of the human mind is the source of the division between instrumental or specific and intrinsic or transcendent goals and values. The mind of the child and of primitive man starts with a consciousness of unity of self and world, conscious and unconscious, individual and community.[1] As evolution proceeds there is an awareness of a split between these dichotomies that were previously fused into a magical and mythical unity associated with bliss. Such awareness of the existential split is subject to a development, which according to Weisskopf, takes place on both phylogenetic and ontogenetic level. There is interrelation between them because the individual repeats the development of the species.[2] The dualism between intrinsic or transcendent and instrumental or specific values is rooted in the split in human experience and thought. Social evolution is a process of the differentiation of values and categories of judgment into the intrinsic and the instrumental, contributing towards the evolution of the mind's plasticity, freedom and transcendence. It shows the progressive creation and realisation of instrumental and existential values through the development of technology and arts of utilisation and proliferation of jobs, occupations and professions; and of intrinsic and transcendent values through the adventures and experiences of knowledge, morality, art and religion. Every civilization, unless it has gone entirely off its feet, achieves an adequate balancing and reconciliation of the pursuit of both intrinsic or transcendental and instrumental or existential ends and values. Every individual, unless he is warped and malformed

[1] Neumann: *The Origins and History of Consciousness.*
[2] Weisskopf: Existence and Values in Maslow: *New Knowledge in Human Values*, p.110.

in his mind and behaviour, develops disinterestedness, flexibility and capacity for abstraction, enabling him to distinguish between instrumental or existential and intrinsic or transcendent values and experiences. Neither existential nor transcendent values can live and thrive in isolation. Existential and transcendent values require and aid one another. But this is not true of all civilizations or stages of social evolution. Sometimes a civilization so develops that intrinsic or transcendent ends and values are not held too dear, and sacrificed at the altar of instrumental or existential ends and values, or the former are transformed in their forms of expression and fulfilment for the resolution of inner tensions and conflicts. Where the civilization or the social situation is such that only a few instrumental or existential values are sought and achieved, and the energies of men are completely canalised for the purpose, social evolution receives a serious set-back. The long-time, exclusive search of fixed, instrumental ends and values becomes self-defeating—a handicap to social adaptation and evolution, an impediment to full understanding and control of the cosmos. Man's evolutionary advance, the progress of mind and society, are an evolution of the *totality* of values that can deal with the entire realm of possibilities in the cosmos. The spurts of his advance are represented by the creation and dissemination of new intrinsic and transcendent values. Through such new values he perceives and conceives the cosmos afresh, for there is no absolute separation between values and cosmos or reality.

The Unification of Cosmos by Values

The vast cosmos whose scope of harmony and perfection is unlimited and unfulfilled, and the human self which seeks and achieves the supreme intrinsic and transcendent values in the most perfect possible unity and harmony with the cosmos are in endless, dynamic infusion and osmosis. The self is possessed of a finite nature, but is potentially the seat and vehicle of the single, all-comprehensive and all-perfect realisation of intrinsic and transcendent values and possibilities, pertinent to other selves and to the cosmos. Due to human imagination and valuation, the cosmos ever seeks the maximum harmonisation of all parts and beings within itself.

The cosmos, in spite of its stubbornness and incoherence,its suffering and evil, presents before man undefined and unexpected possibilities of himself, of his fellow-beings and also of itself. Located within the boundaries of time and space and resisted by things, fellowmen and forces within them, man's evolution, though spatialized and temporalized, extends beyond limited regions and epochs. Its limitlessness corresponds to that of the cosmos, and matches unpredictable novelties and turns in his career, fresh harmonies of his adjustment, and fluent experiences of his goals, values and fulfilments. Human careers, values and fulfilments comprise an experienced whole in which other beings and cosmos are involved—a common pool of values for the sensitive, open community of the cosmos.

Values become absolute, universal and timeless like the cosmos-reality, and promote the experience of cosmos-reality in which he and all fellow-men are maximally integrated, harmonised and perfected. Absolute and transcendent values are identical with the all-comprehensive patterns and possibilities which man had encountered in the previous stages of his evolution and survival. But these were transformed by him into narrow and distorted ends and goals of a limited environment on which he acted. In contrast with the animal, he is permanently bound to fulfil the absolute and transcendent values, to transcend his limited biological environment and immediate life-situation. The self which is superficial, ego-centric and cramped, instead of being resourceful, open and transcendent, is a drag on evolution.

Cosmos infiltrations, infinite in time and unlimited in subtlety and pervasiveness, instil in man ever new impulses and aspirations. Cosmos and man comprise a framework of interwoven processes and values. Due to this inter-weaving and infusion the cosmos with its many potentialities appears as multiplicity, and human value as unity, harmony and coordination.

It is the rhythms and symmetries of the cosmos which elicit and nourish the values and strivings of truth, goodness, beauty and transcendence, emphasizing the essential unity of the many. Both the multiplicity of the cosmos and the unity of values, mutually inter-dependent, are inexhaustible. The cosmos is truer, nobler and more beautiful than man's truest, noblest and loveliest selves. The unlimited and unfathomable cosmos fosters unlimited and unfathomable selves. Man's open, transcending self can not only endure but requires an open, infinite cosmos which he can fill with his insatiable wonder, adoration, sense of beauty, care and solicitude. It is the cosmos which mirrors itself in the incredible courage, majesty and striving not only of the lonely self in its detached contemplation of the cosmos, but also of the many selves that are neighbours, and equally fragments of the cosmos. Man, neighbour and cosmos together constitute an open system of interlocked processes, a unity of multiplicities which is called Evolution.

The rich and variegated texture of Evolution is woven out of the warp and woof of unity and harmony, order and beauty, truth and goodness. The experience of the unity, beauty and harmony of Evolution is grounded on the supreme moral and aesthetic perfection of the self and its identification with the mankind-and-cosmos process as an emergent, harmonious whole. In this manner the open values of the self in the unlimited cosmos exhibit endless possibilities of enhancement and realisation in the infinite multiplicity and complexity of Evolution.

The understanding of Evolution demands the appreciation of both the endless variety and multiplicity of the open cosmos and its unending essential unification and coordination by the open self and values.

Because of the self and values the cosmos cannot comprise any unfulfilled fellow-men or possibilities. Open and transcendent Evolution ever advances towards perfection of harmony and fulfilment which man identifies with Beauty or Goodness. Open Evolution and Beauty or Goodness make each other possible.

CHAPTER XI

THE MORALITY OF HUMAN EVOLUTION

The Genesis of Moral Values

In the track of organic evolution man has emerged as a successful and dominant *social* animal. The transition from the pre-human primate to *Homo sapiens* is brought about by human genes favouring intelligence and educability, symbolic thought and use of tools and language and the development of social feelings and sentiments.[1] Natural selection through thousands of centuries of his living as an omnivorous hunter and food-gatherer implanted in him not only rage, aggressiveness and greed, but also certain feelings of identity and shared emotions and values appropriate for his living in society. At the human dimension, the social is the moral. Darwin himself clearly recognised this. He observed, "The moral sense perhaps affords the best and highest distinction between man and the lower animals; but I need say nothing on this hand, as I have so lately endeavoured to shew that the social instincts, the prime principle of man's moral constitution—with the aid of active intellectual powers and the effects of habit, naturally lead to the golden rule, "As ye would that men should do to you, do ye to them likewise"; and this lies at the foundation of morality."[2] Many moral impulses and patterns of behaviour are forged in the crucible of biological evolution. These have now become a part and parcel of his genetic equipment.

The foundation of human evolution is provided, no doubt, by human genes, but because man's adjustment in his open, man-and-time surpassing environment shows considerable phenotypic plasticity, and is profoundly influenced by the processes of learning and acquisition of values and symbols obtained from fellow-man and cosmos, his evolution is largely *morally* rather than biologically determined. The development of his techniques of adaptation and survival rests largely on the learning and transmission of his unique and complex moral mechanisms and values. These resolve chronic conflicts between instinctual needs and social demands, canalise his basic drives through socially constructive channels and achieve the maturity of rational and harmonious social living. Moral habits, attitudes and values have become, for the most part, the means of psycho-social evolution. Man, however, is no mere biological or social being. He is

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[1] See J. S. Huxley: *Touchstone for Ethics*; and Dobzhansky: The *Biological Basis of Human Freedom*, p. 132.

[2] *Descent of Man and Selection in Relation to Sex*, pp. 494-95.

endowed with instincts of, and tendencies toward, self-transcendence. Seeking wholeness, openness, freedom and transcendence he is something very different from the biological or the social animal. The transcendent creature as he is, he does not seek mere bio-social adjustment and continuity.

Human evolution has safeguarded man's biological and social continuity and dominance, and equipped him not only with tenderness, love and altruism with their ever-widening ambits but also with abstract intelligence and thought and capacity for symbolisation that enable him to transcend himself, his society and his environment. Human values, though instruments of selection and survival, cannot accordingly be derived from biological processes and from organic evolution. These are relative, but their ultimate relationship is to man's evolutionary destiny as a whole. His capacities for conceptualisation, symbolisation and identification enable him to think and adjust himself in terms of his open, unlimited, and imponderable symbolic environment that far surpasses his finite biological environment at any given time. His adaptedness is quite regardless of the natural conditions and aims of selection and survival of selection and survival of the individual and the species. Organic evolution is utilitarian, pragmatic and exceedingly short-sighted. It cannot be planned nor manipulated in terms of abstractions, appreciations and identifications or empathies. Man's self-transcending insights and ultimate values plan and direct his evolutionary development in dimensions and qualities of experience that transcend life and survival.

Human nature and values are a part at once of the biological and the cultural heritage. Organised society and culture aid man in seeking and achieving a given set of intrinsic values, the fulfilment of which becomes associated with his creativity, freedom and transcendence, and not with mere adaptation and survival. Human civilization distinguishes between the proximate and ultimate values, and directs through education, role-and-status system, law, moral code and public opinion that every man should prefer the latter to the former. This is the basic *ethical* process. Evolution at the human dimension is essentially purposive, moral and prophetic. It culminates forwards in transcendent mind, values and morality that fully and perfectly realise the potentialities of the person.

The Ordering of Values in Moral Evolution

Human evolution is an ascent of consciousness and values represented by a well-established priority of the intrinsicalities of truth, beauty and goodness to the instrumentals—biologic and economic goals and satisfactions. This is often aided and secured, however, by the improvement of biological status and economic well-being, i.e. health, efficiency, longevity and liberty, and the many-sided control and amelioration of environmental conditions. An improvement of technic-industrial, housing and living

conditions, relaxation of economic pressure and change in the set-up of economic institutions create new intrinsic values and new patterns of goals and behaviour for the individual. There are re-education and resocialisation of individuals and groups who more and more seek and achieve intrinsic and ultimate rather than instrumental and proximate values. As the personality and modes of social relations and behaviour are transformed through trial and error or a deliberate social policy, the old hierarchy of values with its associated status-prestige scheme, traditions and rights and duties is given up. Intrinsic, ultimate and transcendent values are enhanced rather than reduced through sharing, and become powerful social binders. As these became accessible and achievable goals for a larger and larger number of persons, the entire culture or social situation as an "inter-subjective field", comprising the unity of the value-seeking person, the set of values and the society, undergoes a marked qualitative change for the better. The manner in which the architecture of values develops is a matter of the set-up of social institutions and the ongoing processes of mind, morals and society.

The wholeness and compositeness of values, the hierarchy of intrinsic and instrumental and of transcendent and existential values, and the integral character of the social-moral process alike demand the treatment of human evolution in the background of values and value-orientations. Social evolution calls for ever new adaptations, ever more appropriate human roles and statuses as life-expressions, as discoveries of, and strivings towards greater fullness and richness of value-creation and achievement that determine and regulate the chequered course of human civilization.

Changes in the economic environment and the arts and technologies and social and economic shiftings constantly engender new conflicts and frustrations and demand new values, statuses and obligations that can be comprehended only by the disciplines that dwell on the truths, beauties, goodnesses and transcendences of life. On the other hand, given a knowledge of type-values and of their order and scaling in a given civilization, it is possible to determine their significant social and moral consequences, and predict with a high degree of certainty social and moral changes.

Finally, the biological and social disciplines should recognise man's evolutionary advance through greater freedom and selective and purposive control of the environment as accruing from his choice and attainment of intrinsic, universal and transcendent values in harmony with the instrumental, specific and existential ones. Human progress is measured by man's control and direction of the processes of value-choice and value-transformation of which he is a product. Out of the process of adaptation and control that rises from dimension to dimension emerge his orientation of values, his scaling of intrinsic and instrumental and of altruistic and egoistic

values that he revises and re-interprets as social evolution proceeds. He defines social evolution through his increased rational cognition and control of his environment, and this implies the qualitative improvement of his dispositions and capacities to take into account all the values, all the moral attitudes, habits and norms that he considers worth while and orders them according to a system. The law of morality is that the normal, mature human mind in rationally dealing with the values involved in a given situation chooses the intrinsic and transcendent values that can be most widely shared by fellowmen, such *choice* being inevitable due to the structure of the human mind itself. Such a law guides and directs the mechanisms of the socio-genic evolutionary system, and selects and fosters the human qualities and capacities that the latter brings about. This may be called human 'anagenesis' or evolutionary progress.

Ethics and the Psychological Theory of Value Hierarchy

Both the "field" theory of modern psychology and Jung's theory of the "collective unconscious", comprising the archetypal symbols derived from the intellectual and moral heritage of the race, give support to the assumption that the human mind has some sort of a scale, a kind of hierarchy of values to which his loyalties and allegiances can be related.[1] The preferences not of neurotics but of healthy and wholesome human beings show what is good for the human mind and evolution in the long run. The motivations of sick persons cannot be equated with those of healthy persons. The latter aim not at ego-centric, segmentally motivated goals but at wholesome, shared goals that take due consideration of a totality of beliefs, interests and values. Intrinsic values imply balance, harmony and integration of goals and interests and self-transcendence in terms of a wholeness which potentially pre-exists in the human person. The *bio-ethical* concept of self-transcendence, the *axiological* concept of the hegemony of intrinsic, ultimate and transcendent values and the *metaphysical* concept of human Essence or Being have in common the open, holistic, integrating human evolutionary trend.

Intrinsic and ideal values, no doubt, refer to a wider context, a larger total of meanings, satisfactions and experiences than instrumental values and are therefore superior intellectual tools, in the sense of Dewey, which guide human behaviour and evolution. This also points to the order of "natural" strength and priority of intrinsic values for general self-actualisation and self-transcendence of the person. Human valuation is derived from the fundamental theory or law of priority of intrinsic and ultimate values to instrumental and specific values, just as applied science and technology are derived from the fundamental laws or theories of physics. Modern physics has transformed the external human-world. The science of values,

[1] K. J. Newmann: Tyranny and Group Loyalties, *Philosophy*, July, 1943.

once it is fully comprehended, will similarly transform human values, society and civilization—the internal world of human living and experience, and subtly and profoundly direct human evolution. Human ethics is concerned with both the freedom, wholeness and transcendence of mind or self, and the openness of values, of man, society and cosmos as wholes. From this viewpoint anything that inhibits or thwarts the openness, wholeness or transcendence of self and values is *wrong*, that which fosters or fulfills it is *right*. Such is the prophetic morality of man's evolutionary trend.

Morality as Instrument of Purposive Social Selection

It is clear that man constantly remakes society and civilization and their role-status-prestige scheme, moral code and rights and duties by his value orientations. These relate to his establishment of the "natural" supremacy of intrinsic, ideal or ultimate values over instrumental social values, and of instrumental social values over instrumental bio-ecological values. In the triple dimensions of man's adaptation, bio-ecological, social and ideal or transcendent, value-seeking, coordination and choice constantly go on. This provides, indeed, the major key to the realisation of potentialities of the person and to moral progress. Man's values are enduring and timeless, but they can only be effectively realised in the world of social change. Evolution is ever changeful, full of crises and spurts, but the world of values remains perennial and unchanging, stressing the essential unity of human nature and of man's moral experience. If life requires the fitness of the physical environment for man's organic functioning and growth, human values with their "natural" scale or gradation, rooted in the integrity, creativeness and transcendence of the human nature, are enduring instruments or mechanisms for the control of the physical environment *via* his conscience and cultural and moral heritage. Such instruments or mechanisms largely supersede natural by conscious, purposive selection, and ideally direct human development through the push forward of human nature towards fuller and fuller actualisation of its potentialities. In the world of moral and ideal values we leave the world of adaptation and change and enter the world of permanence and immortality. There is a dynamic give-and-take between the immortal and transcendent world of morality and the finite, temporal world of human relations, behaviour and institutions. All human relations are immortalised as seats of goodness achieved ; the manifold possibilities of moral and ideal eternal values embody themselves in the multiplicity and temporality of human adjustments.

The Ontological Approach to Value and Evolution

Man's value-pattern embodies his enduring experiences and strivings in the course of his adaptation to the cosmos *via* his society and morality. It bears a lasting testimony to the patterns of social and moral communion

that direct, integrate and organise evolution and become expressions of the zest and efficacy of Life and creativeness of Being.

The value system pertains to the coordination and interpenetration of the triple dimensions of his environment and evolution—bio-ecological, social and transcendent. Embodying universal, formative, vital social and ideal tendencies in progressive human patterns, values intermesh. The various dimensions of human adaptation and values overlap, intersect and interpenetrate one another. Each advance in social evolution is the consequence of a better order and harmony and a fuller comprehension of Being, and all values, economic, social, and moral and ideal, are involved in the creative process of Becoming. Stability, consistency, balance, unity in variety and transcendence characterise all value-creation, embodying the goal and purpose of sustaining, furthering and expanding Being and its possibilities. In value creation, choice and fulfilment, moral values are central as these are involved in all human relations and potentialities. It is the ideal, open or transcendent dimension of Being, rooted in human potentialities rather than actualities, and the moral values and norms that largely, consciously or unconsciously, guide and control evolutionary development.

Ethical principles originate during primate evolution but are realised more articulately, consciously and completely in human directioned development towards self-actualisation and self-transcendence. First, the strivings for self-actualisation and self-transcendence in terms of wholeness and communion with the cosmos, and moral strivings and values are dynamically related to each other. Secondly, man in the process of his self-actualisation and self-transcendence develops an integrative and harmonious value system which synthesizes opposites, and affirms and achieves complete freedom and transcendence—the realisation of his essence or Being. In the creative ground of Being all polarities of values and strivings are balanced and reconciled. Human evolution cannot escape from the polarities of existence and values that are aggravated by society and morality, and that can be harmonised only in the higher spiritual dimension of unity and transcendence of Being. The self-actualising and the self-transcending nature of Being is the ontological locus of moral values. The system of values, conscience, faith and transcendence are all derived from the essential nature of man, the structure of the ultimate reality or Being.

The Progressive Pattern in Moral Evolution

We may now survey the various dimensions or stages of human evolution, values and morality that embody a progressive series and are integrated into an open, holistic, balanced, dynamic system :

DIMENSIONS OF MORALITY, VALUES AND VIRTUES

I Evolution	II Values	III Experience	IV Social Integration	V Ethical Norm	VI System Virtues
1. Bio-ecological	Sustenance, Dominance and Continuity	Bio-psychological Control	Interest-Group	Reciprocity	Prudence
2. Social	Status	Social Integration	Community	Justice	Loyalty
3. Transcendent	Personality and Character	Spiritual At-homeness, Self-transcendence	Man-kind-as-a-whole	Love	Reverence

Biologically, life is always maintained by balance, integration and interdependence. In the human body, as in the body of any other mammal, there is sometimes a lag or discontinuity in the adaptation of one part to functional disturbances or changes in another part which is largely corrected by "homeostasis." The large and sensitive brain in man has proved a far more useful tool for the purposes of his biological stability and balance than any physiological "homeostasis" or mutation could be. Human consciousness introduces a long chain of psychological and social homeostases for achieving balances and harmonies out of functional disturbances and maladjustments. Human social evolution and survival depend upon continual homeostatic balance and reconciliation of needs, ideas, techniques and values in different dimensions or orders of adaptation. Morality is the central homeostatic process of man's total adaptation to his conditions of existence and progress in the psycho-social environment. There are no social relations and behaviour that are not moral. The principles of social evolution and the ethical norms are congruent, fitting into the particular context and level of social adaptation and experience. "All morality, be it pressure and aspiration," as Bergson has said, "is in essence biological."[1] All human evolution engenders and transmits values and morality.

Though there are misfits and maladjustments, defeats and backslidings without number, we witness a progressive trend mediated by moral principles and norms which are derived from the impact of the changing external world on the minds of men *via* groups and institutions. Ethical norm emerges with the growth and maturation of mental life that are stimulated by group intimacy and experience. Morality, in other words, springs from man's group connection, his sense of communion and sharing, the feeling that he must transcend his private world of impulses, desires and emotions. A part of morality is internalised in the structure of self as super-ego, conscience and faith that show a qualitative development from the irrationality and ego-centricity of childhood to the rational self-

[1] *The Two Sources of Morality and Religion*, p. 91.

extension and self-transcendence of the adult. This is stimulated and promoted by the transition of the social milieu from the Interest-group through Community to open and ideal Commonalty of Mankind. Another part of morality is embodied in the group expectancies, norms, values and sanctions that socially orientate the behaviour of the individual. The moral mechanisms comprise a natural process of transformation of the individual-in-groups. We can, therefore, correctly grade one type of social grouping as being morally superior to another, and assess moral evolution in the background of the change of social milieu from the Interest-group through Community to (ideal) Commonalty or open society of the earth.

Moral evolution in general depends on the development of psychological mechanisms and techniques of human adaptation to the bio-physical conditions of living and maturation in the psycho-social dimension of the human personality. Human depth, morals and commitment are higher in the Community than in the Interest-group, and the highest in the abstract Commonalty groups or ideal brotherhoods of mankind. Evolution at the psycho-social dimension identifies man's freedom and obligation with the most profound depth of the self and the largest extension of the human community. His transcendence, justice and altruism—in one word, moral ideal—enter into evolution that becomes "open", achieving unknown possibilities of his nature. The successive ethical norms of Reciprocity, Justice and Love and virtues of Prudence, Loyalty and Reverence that emerge in the moral evolution of mankind—in the successive ideal types of groups, Interest-group, Community and Commonalty—comprise the indispensable cultural mechanisms or organs that guide the evolution of the individual and groups—the progressive patterns of impulsion associated with the development of society and the personality of man evolving together by reciprocal transactions into ever new transcending qualities.

Empirical Principles in Moral Evolution

It is clear that from the point of view of the level and unity of organisation we witness a more or less continual improvement in group participation or integration, morale, depth and commitment of the personality, typified by the movement from the Interest-group through Community to open and (abstract) Mankind-as-a whole which corresponds to the ideal of the World Organisation now dawning upon the minds and hearts of men. From the three "ideal types" of social participation that cover all possible stable human associations, and are marked by improvement in the level of psychological maturity emerge the corresponding moral norms of Reciprocity, Justice and Love. These norms are psychological imperatives, derived from the bonds of typical groups in social development, from the nature of evolutionary changes undergone in the personality-social process. These express the direction in which both personality and society develop, the moral principles being identical with the unfolding

experiences of communion, commitment and striving of the individual. From this viewpoint "scientific" ethics roots itself in psychological and sociological evidences for the evolution of moral ideas, values and sanctions. It consists in maintaining or fostering open ethical development of human beings in groups that mediate the movement from Reciprocity through Justice to Love and Sharing, and from Prudence through Loyalty to Reverence. It is phylogenetic, i.e. this development corresponds to the evolutionary direction of the human species itself, aiding its survival, continuity and advance, and fulfilling its unrealised potentialities.

Man's choice of groups, the level of self and communion, the ethical principles of Reciprocity, Justice and Love and the virtues and ideals of Prudence, Loyalty and Reverence, which his divergent group connections involve, enter into the new, specifically human dimension of the evolutionary process. Ethics emerges from the individual's morale, communion and responsibility in the on-going group orientation that clarifies and articulates his moral attitudes, conscience and loyalties. It becomes empirical, and is provided with a dynamic conceptual frame-work by social science; the notions of the Interest-group, Community and Mankind, shifting with man's communion and social participation and guiding his rational behaviour in the changing social scene with its new articulation of human relations, attitudes and values. Thus does morality change its meaning with the transformation of group and individual attitudes and loyalties often without the individual being aware of it.

The treatise on *Science and Ethics*, edited by Waddington sometime back, made out a strong case for the formulation of scientific principles in ethics that may be in accordance with human social evolution and at the same time show that universality in practice which has hitherto failed mankind.[1] This notable collaborative endeavour to reach empirical principles in man's ethical development in the broad perspective of his evolution has not been successful. The controversies and dilemmas that it has revealed are largely due to an inadequate appreciation of the different phases and dimensions of moral valuation. No attempt is made to reach scientific principles of morality based on the developmental processes in mind, groups and values in their successive orders or dimensions.[2]

Human social evolution is marked by the trend of man reaching greater individuation and freedom, more internal than external controls, and higher levels of unity and organisation embodied in values and morality, parallel with the increase in size and solidarity of basic human groups or associations created and maintained largely by intrinsic, ideal and transcendent values, and culminating in the ideal of the open society of mankind-and-cosmos as a whole.

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[1] See also Waddington : *The Ethical Animal.*
[2] My earlier book, *The Dynamics of Morals* (1950) essayed the task.

Mankind-as-a whole and World-Man as Moral Norms

Mankind-as-a whole represents the most extensive human association governed by the highest ethical norm that the individual can realise viz. Love and Sharing grounded in Reverence for Living. The nation, the class, the family or any other social group are by comparison inferior social and moral systems. It is a perversion of values when the morality of the family, class or nation supersedes or counteracts the morality of mankind-as-a whole. The devaluation of humanity is a confusion of moral standards or what Robert S. Hartman calls "the transposition of the moral and the legal." This occurs in a system of thought in which nations are treated as "powers" or physical entities and forces that are in equilibrium or in a vacuum in relation to other nations or "powers". The intrinsic supreme values of the individual as World Man and of Mankind-as-a Whole must be safeguarded in order that collectivities like nations, classes or other groups may not reduce mankind awareness, nor encourage the struggle between peoples and the mass slaughter of atomic warfare in the names of false fetishes loved or adored. As Niebuhr puts it, the crucial ethical problem of the present age is the antithesis between "moral man" and "immoral society". While states and "powers" become cunning, deceitful and immoral, the entire trend of evolution points the way towards mankind functioning as an organized moral whole. This will reduce and ultimately abolish the tremendous conflict between the intrinsic values of the human individual and of mankind, both considered as "wholes," and the instrumental values of groups, classes and nations—the "tribalisms" which the human species has yet to outgrow in its psycho-social development.

The social sciences have now to define and focus the social, economic and political conditions under which moral progress is possible—the advance from the principles of Prudence and Loyalty to those of Love and Sharing, rooted in Reverence—and also the next steps in social integration—the advance from Interest-groups, Communities, nations and blocs fo nations to Mankind-as-an Integrated and Organised Whole. These should also clarify amoral and anti-evolutionary forces, such as the diffusion of false myths of race and colour, the ignorance of the masses in respect of other cultures, the unbalance of world population and resources, the disruptive influence of technological culture and of class ideologies and tensions on the wholeness and balance of man's living, the loss of natural hierarchy of values and the shift from intrinsic to instrumental values. Imagination, empathy and insight as well as social foresight and judgment are all indispensable in the social sciences for the scrutiny of forces which create anti-social attitudes and disvalues and sustain and perpetuate segmented, closed, amoral or immoral groups and associations. Mankind-as-a whole is the highest ethical social grouping. Here man's communion is the deepest and

most universal—the basis of striving for, and achievement of, his supreme intrinsic values of truth, beauty and goodness. The organised realisation of the individual's highest values implies at once the profoundest depth of the personality and the most intense temporal equality and solidarity of mankind. Mankind-as-a whole, psychologically meaningful and ethically obligatory, includes and transcends man's earlier stages of evolution and now provides the basis of his further advance.

Man's Evolution, Trans-Biological and Global

All this entirely alters the *modus operandi*, dimension and perspective in human development. Man's development has become trans-biological and global, embodying ever fuller patterns of experience in an ever wider and more significant cosmos that he conceives. The grand pattern of the cosmos achieves its meanings, values and potentialities by reason of its higher and higher levels of unity and order that man can reach. The metaphysical principles of unity or order ultimately are the laws of human development. This is because man's inner nature itself is unity or order.

The fundamental "general law" of human evolution stresses the multi-dimensionality of human evolution and values as well as the natural unity of the value-system. Each advance in human evolution is an advance of all dimensions or orders of adjustment, of the totality of values..[1] Man, who is unique in evolution and master over all other animals, is, however, too young as species to have fully adjusted his psycho-social environment within a span of only sixty centuries to his hereditary nature and his potentialities. On the one hand, his highly developed cerebral cortex and capacity for symbolic interpretation and communication make him susceptible to choice of disvalues, moral backsliding, and repetitive egoistic and aggressive behaviour and to chronic ego insecurity, anger and hate. These reduce his social though not his biological fitness. On the other hand, his neo-cortex functions somewhat separately, due probably to his prolonged development and delayed maturity, from the more primitive archipallial visceral centres, leading to inadequate cortical control and deployment of his maladaptive sexuality, greed, rage and aggressiveness. In his bio-psychology he has, indeed, shown an uneven, disharmonious and lop-sided development that endangers his stability and threatens his survival. *Homo sapiens* is today *Homo instabilis* driven by aggressiveness, fear and anxiety. It is the profound imbalance of ideas, techniques and values in the different dimensions of his adaptation that makes man's biological future uncertain, even precarious.

Instability of Man

Man as species has yet to establish a stable, harmonious mode of social

[1] Hart: *Treatise on Values*, p. 82.

living approximate to his normal instinctive behaviour and to his species survival. No adequate standards of living, health and nutrition can be maintained in a field of continual ecological depletion or denudation of resources brought about by his improvidence and greed. His higher needs and values are left unfulfilled and his potentialities nipped in the bud where his prolific breeding over-reaches the means of subsistence and brings all-round misery and disease. No society can foster sociability and goodwill, nor stimulate maternal love, tenderness and solicitude where the family which is basic for the fulfilment of his heightened instinctual needs and development of interpersonal relations is disrupted, or where the child is deprived of the mother's nursing and care from birth. Intelligence and aptitudes cannot thrive where man's choice and responsibility are continually invaded by the State or he is exposed to mass propaganda and conditioning to truths and values regarded by the State or any elite group as absolute and sacrosanct. Neither morals nor beauty can thrive where habitations are ugly and overcrowded, and where chronic class conflicts and wars lead to the complete lapse of the intrinsicalities of life. Beauty, love and goodness can expand only in a social world where each individual, irrespective of the group to which he belongs, can make the most of his capacities and potentialities; where his duties and loyalties extend beyond the family and the class to the nations, and to an interdependent world community; and where the fine arts, myth and religion instil altruism, charity and compassion as nobler impulsions than reciprocity, equity and justice.

Biologically speaking, the known hereditary nature of man is improving, though exceedingly slowly, showing new qualities and patterns of experience. But the plasticity, inventiveness or creativeness of his mind and rational behaviour that have won his biological dominance must be used in a manner most advantageous socially, rather than for endangering or destroying himself and his civilization. It is then only that his behaviour, intelligent, imaginative and altruistic, can be biologically appropriate, and ensure and maintain his evolutionary advance. It is possible that his intellectual acumen, synthetic intuition, aesthetic sensibility, mystical self-transcendence, spiritual love, altruism, compassion and reverence for life can improve in the future beyond the present higher levels. The widening of his social awareness, feeling and imagination would be of great evolutionary significane although the current negative, "low-ceiling, jungle psychology", as Abraham Marlow labels it, does not show any interest in this. Similarly telepathic knowledge and feeling and mystical extra-sensory and transcendental experiences that already play a considerable part in human life can also develop and enable man to extend the horizons of his experience.

Cosmic Man, Mind and Culture

In the deeper strata of memory and consciousness man is one with

fellow-man, and his creative imagination builds up mankind-awareness and feeling and ideal of the most extensive human community.[1] But for most individuals the deeper, more extensive and transcending self lies dormant and inactive. Even the commonwealth of mankind remains a mere dream. The evolution of life and mind is blocked for the majority of persons. The conepts of Life, Mind and Values ought to be enlarged so as to include meta-biological and meta-psychological dimensions in order to understand the nature of the Cosmic Man and the Cosmic Mind. These embody themselves in a variety of civilizations and social systems that have their own individuality or distinctiveness, and yet contribute towards a mankind conception and imagination. The human mind ever reaches out towards larger and larger wholes, and Mankind-as a Whole has emerged in this age as an organised integrative moral force.

What James Harvey Robinson observed is true: "One can invent more and more mind as we go along, 'now that we have the trick'." There is nothing fixed and definitive about the biological nature of man; the human mind constantly creates something which is qualitatively richer, deeper and broader and which constitutes the ever-widening basis for his advance. A steadily enlarging circle of psychologists, following the lead of Freud, Jung and other psycho-analysts, is convinced that at the deeper level of the mind mankind is perceived and felt as a whole, though a will toward the solidarity of the global community is far from being manifest. To the extent man cannot move from the immediate, specific and instrumental to the transcendent, universal and intrinsic attitudes and values, and is circumscribed in his habits, devotions and loyalties, he sins against his own self and Mankind-as-a Whole which is found in its unity in each individual.

Human values and personalities show new qualities and modes of experience, circumscribed as these are by genotypes, historical traditions and regional cultures that keep them within certain patterns. Yet man has produced a world tradition. Among the animals he has been the most widely travelled, and the most successfully acclimatised creature; by his migration, trade, colonisation, conquest and adventure he has created a global culture—a unified system of science, knowledge and morality. Human values at their highest produce and maintain a well-balanced, integrated, universal, transcendent self and a unified ethical world community. On the one hand, the inner growth and maturation of personality rest on the creation of more and new intrinsic values that can be shared by larger and larger sections of society and humanity. On the other hand, it is the intrinsic and universal values of a particular society and culture that are selected and prized and become positively significant in the broad march of human progress. These are shared by all mankind. Their

[1] Bucke: *Cosmic Consciousness.*

enhancement is conducive to global unity as well as to the enrichment of the common pool of truths and values for mankind—the global cultural inheritance. The evolution of *Homo sapiens* can now be accelerated mainly by an impingement, interpenetration and fusion of cultures and traditions—the supersession of cultural isolation by a global tradition. Conversely, the trends of evolution in the biological sector can never intermingle nor fuse. The cumulative global tradition increasingly operates as a filter, screen or sieve of the selection of ideas, values and institutions in the shared experience of men of different races and environments, replacing natural selection by the new and more efficient method of conscious selection on a world scale. Many historic civilizations disappeared completely because these were confined to small localities and regions, and to very limited and hence vulnerable sections of the population.

The Dialectic of Ethical Norms in Human Evolution

We may now briefly review the ethical norms and mechanisms of human social evolution that increasingly replace the goals and mechanisms of biological evolution and natural selection. An integrated world individual and a unified world system are the goals of conscious cultural selection of the human species on which rest its survival and progress. The selective systems which yield these goals are three, viz. first, the structure of human personality; second, the pattern of values; and, third, the organisation of man's unlimited, external social heritage—the world tradition. (Column I of Table on P. 187).

The processes of dynamic reciprocal adjustment between the infinitely open, forward-oriented selective systems are rational and purposive, rather than unconscious and instinctive. Human social evolution works its changes on person, values and culture silently, not so much by coercion, violence and war as by communication and understanding, leading towards greater richness, comprehensiveness and harmony than the forms or species gradually displaced as misfits for human adaptation.

We have dealt with these in the previous chapters, but these have never been brought out in a table where we can scrutinise them side by side. Personality, values and world system evolve in their togetherness and reciprocal interchange, each through its own polarity or opposition of modes of chanelling expression (See Column II of Table on P. 187). Man in his personality, his system of values and his pattern of world tradition form unities of opposite tendencies that are all balanced and synthesized on a higher dimension than on the dimension of the opposites, conflicts and dichotomies. All of them have in common a holistic, harmonising character, ever ascending to a higher dimension. The goals of the complex, inter-dependent cultural processes of selection are, first, the gradual evolution of human nature and potentials and emergence of a unified,

transcendent world personality; second, the evolution and scaling of values so as to establish the natural hegemony of the intrinsic, universal and transcendent values; and third, the multilinear autonomous evolution of peoples and cultures within the unity of world science, knowledge and morality. (Column III of Table on P. 187)

The theory of "transactions", which we have adopted throughout, following the mode of thinking of Dewey and Bentley, stresses that there is a meaningful and evaluative congruence between the selective action of the personal, normative and cultural situations and systems. The personality triats and attributes, the scale and orientation of dominant values, and the status-power system in society derived from it, and the cultural pattern saturated by, and in its turn replenishing, the pool of world traditions and techniques, all mutually adapt themselves in the course of social evolution to the survival values of species. The evaluated objects of cultural selection are Personality—Values—and the Cultural Pattern in their dynamic interdependence and interpenetration.

The major schools of sociology and psychology, as they import the theory of natural selection, treat human behaviour as approximating to a pattern of action and reaction of equal, simple and homogeneous forces, as in a "closed system" of classical physics. When human mind, communication and values come into the picture, we have to introduce into the complex pattern of natural selection the concepts of circular, reciprocal, cumulative and spiral interactions or "transactions," as Dewey and Bentley call these, as well as "feed-back" mechanisms of conforming habits and values that are learned and transmitted, directing the adjustments of human organisms to each other and to the environment. New principles of equilibrium and integration, purposive social selection and individual learning largely replace natural selection. The former become the silent, imperceptible vehicles for the norm of natural selection. In other words, the values of life, as these are embodied in the preferences of the individual and internalised in the structure of his personality as conscience and faith, and, again as selected, systematised and transmitted as the institutional pattern and the moral tradition, fuse with survival values. Natural selection cannot be eschewed from any form of life, but is operative on men and peoples *via* the orientation of their dominant urges and motivations, the scaling of their goals and values, the moral order and the set-up of institutions and culture. The goals and directives of human social evolution, no doubt, comprise the fulfilment of the intrinsic and transcendent values of life emerging from the dynamic interchange between Person, Values and World, but these hide in their bosom the bloodshed, pain and suffering of organic evolution.

Man dwells in several realms, the biological, the social and the transcendent, and his career is the meeting-ground of the forces of organic evolution and natural selection from below, and the intrinsic and transcendent

values and satisfactions from above that merge and interpenetrate. In all dimensions of human adaptation, biological, social and ideal, there is a movement from instrumental and specific to intrinsic and transcendent values. In human evolution, the gentle, socially conditioned and directed value experience becomes the locus of the impacts of natural and cultural selection and survival fused together. Behind the bio-psychological demands of the wholeness and transcendence of self, the gradation of human needs and values and the moral imperatives of fulfilment of human potentialities and solidarity of the human species are the sanctions of the norm of natural selection.

The survival of man both as individual and as species depends in the future on a system of ideal motivations and values of pan-human moral obligations and cooperative global endeavours that can impel him towards universal personality, universal values and universal community. The integration of world personality, universal values and intelligently controlled global society will be the result of dialectical processes of opposition and fusion of contradictory and complementary truths and values (Column II of Table on P. 187). Biologists, social scientists and metaphysicians equally agree about the dialectical structure of existence and experience. Biologists move on the level of the polarities of life and environment. Psychologists and social scientists stress the balancing and harmonising of the polarities of impulse and reason, conscious and unconscious, instrumental and intrinsic values, and their balancing in an integrative value system. Metaphysicians assert the dialectical antithesis of all truths and values fused in the ultimate reality.

The dialectic of human social evolution is indicated below:

		Thesis	Antithesis	Synthesis
1	Personality	Self-Determination	Self-Transcendence	Unified Self
2	Values	Instrumental and Specific Values	Intrinsic and Transcendent Values	Natural Value System
3	Tradition	Ethnocentrism and Nationalism	World Community	Multi-Cultural Evolution

The above processes are akin to the bi-polar mechanisms in organic evolution which J.B.S. Haldane has distinguished.[1]

	Thesis	Antithesis	Synthesis
1	Heredity	Mutation	Variation
2	Variation	Selection	Evolution
3	Selection of the Fittest Individuals	Consequent Loss of Fitness in the Species	Survival of those Species Showing Little Intra-specific competition.

[1] *Science and Society*, 1937.

Northrop considers the Hegelian and Darwinian concepts of evolution as altogether antithetical and conflicting. According to him, Hegelian evolution, involving thesis and antithesis and hence called "dialectical," is dramatic and revolutionary; while Darwinian evolution, involving the dynamics of genetical mutations or chance variations, is "gradualistic."[1] This is an unwarranted simplification. The Hegelian theory of dialectical evolution is a metaphysical approach to nature and to history, and its universal logic that refers to principles and propositions and not to physical facts and forces can, by no means, be assumed as postulating struggle and force. It is clear that the Hegelian view of polarity or antithesis, and of the sequence of thesis, antithesis and synthesis underlying the logic of development is applicable equally to the phenomena of life, consciousness, and society. Organic and human social evolution fully affirms the sequence of antithetical goals or theses working towards a final synthesis. It is only the Marxist realistic epistemology, with its substitution of materialistic for idealistic forces, and its importation of the logical supremacy of the external material objects and relations into the Hegelian framework of thought that postulate conflict and revolution in the theory of the dialectical march of society. The logic of dialectical evolutionism is amoral. It reveals the progress of man and society towards higher truths and values, human relations and social arrangements through the unity and harmony of polar principles and tendencies. Man and society, if these elevate one of the great polarities of life as absolute and complete and reduce the other merely to derivative and adventitious, take a self-defeating and immoral course, inhibiting the development of new values and a new moral pattern.

In the on-going course of evolution in man's adaptive life-zone, new types of personality, new patterns of values, new moral orders and new world systems emerge through the appreciation of polar interrelations and ultimate unity, wholeness and transcendence. Man is constantly modifying his dispositions, and showing new moral relations, adjustibilities and potentialities. With new "species" of men, evolution constantly goes on. The cosmos constantly evolves with its new species of societies of societies and new integrations and coordinations of values. Values and evolution are rooted in the ultimate ground of Being whence are derived conscience and the categorical imperative. In Being are finally resolved all contradictions of human facts and values, of impulse and conscience, and of existence and transcendence. Man's mature, creative conscience and the moral law are the only guides to ever deeper and higher dimensions of unity within Being, between beings and with the cosmos. Ultimately Being, values and cosmos become one, and evolution in its various phases or dimensions becomes indivisible.

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[1] *Philosophical Anthropology and Practical Politics*, pp. 143-145.

ETHICAL NORMS OF HUMAN EVOLUTION

I *Selective System*	II *Dialectic of Ethical Norms*	III *Norms of Social Evolution*
1—Structure of Human Personality	Freedom and Uniqueness v. Universality and Impersonality	Integrated Personality of World-Man or Real Being
2—Pattern of Values	Intrinsic, Universal and Transcendent Values v. Instrumental, Specific and Existential Values	Natural Hegemony of Intrinsic, Universal and Transcendent Values
3—World Tradition	Mankind-as-a Whole v. Uniqueness of Specific Cultural pattern	Multilinear Cultural Evolution within the Unity of World Culture

CHAPTER XII

THE VISTAS OF OPEN EVOLUTION

The Emergence of a Cosmic Mind

Man injects his mind, personality and values into every dimension and sphere of his evolution. Evolution in the past did not always produce higher and superior animals, nor even those that were closely fitted to the environment. But the evolutionary process which created the human animal marked a true advance. Biologically speaking, evolution is no longer restricted to certain parts of the animal body, nor to the intractable, mutated body, nor, again, to the limited and specific possibilities that confront the animal body in its determinate environment. It now comprehends not only the whole body but also the whole mind as well as the personality, values and cosmos.

Man's larger, more complex and more sensitive brain and mind, as these have evolved for the last million years, may lead in the future to fresh man-and-cosmos interchanges and interpenetrations, to new human illuminations, appreciations and dedications far beyond anything imaginable at present. In so far as his self and values instead of being too narrow, fearsome and possessive become daring, open and cosmic, and develop transcending qualities independent of the life-situations, which are characteristic of all evolutionary advance, he becomes a complete man and all of the human species from the beginning to the present time. The self-transcending mind of each individual has its opportunity to make a great deal out of human potentialities, to magnify his humanness, and take a forward step in human evolution, and in this it is aided by society, values and civilization.

The Significance of Man's Cosmic Adventure

Evolution is now an open venture—the outcome of transcending mind, meanings and values and the most general and unlimited possibilities of existence correlated with the full range of human mental capacities and promises. Personality, values and potentialities embrace every level and sphere of man's being—the sweep and sensitivity of brain and consciousness, the "propriate" or central striving and transcendence of self, and the goals, purposes and possibilities of all relations and affairs of life, biological, social and cosmic or transcendent. Behind human evolution are now these all-comprehensive forms and patterns of the human mind, the unbounded meanings, values and potentialities of the self-and-cosmos which control man from beyond, and change the pace, dimensions and boundaries of his development, even his very nature.

Whitehead has aptly remarked: "Human life is driven forward by its dim apprehension of notions too general for its existing language." Man's insight into the order and harmony of the cosmos, his appreciation of beauty, his identity-feeling or empathy, compassion and ecstasy and his conscience, faith and hope are marvellous qualities and capacities whose mechanisms and processes as yet elude the psychological sciences. Among other human talents and capacities these can neither be expressed adequately in words, nor defined by understanding and analysis. Yet it is these which determine the worth and dignity of human life and the goal and direction of human evolution. As man's brain through the course of millennia of growth gains a certain size, intricacy and sensitiveness, his mind reaches cosmic dimension and sweep. His transcendent, cosmic mind identifies itself with Life, Wisdom and Beauty that are acknowledged by him as the vital *elan* of the evolutionary process, and of his own human destiny. What are dim outlines and faint glimpses grow into radiant, sharp and steady illumination, and shape, through human faith, conscience and freedom the complete expression of the destiny of mankind and cosmos.

The Infinitely Open, Creative Expressions of Mind

Man's consciousness and understanding of his own transcending, cosmic mind and destiny are yet inchoate, imperfect and inadequate. Yet in the twentieth century he has made appreciable progress in this through the application of the scientific and reflective spirit to the infinitely open, creative expressions of his life, consciousness and values previously unforeseen. The biologist Berrill observes: "As our brains have grown, so has the power of reason and with it all have come these strange new lights we call the spirit. And by this token if our brains continue to evolve in the same general manner as they have in the past, the new capacity for understanding and new illuminations may flood in far beyond anything we can at present conceive. The essential human qualities of the mind are already new in kind. Those that would appear might be just as strange and far more wonderful, while those which are here or immanent may blossom beyond recognition. If such is our destiny, even as a remote possibility, we should never lose sight of it, for as a star to steer by it beckons brightly."[1]

The psychologist Gardner Murphy has also recently stressed the unpredictable self-fulfilment that lies before man through catching and making the most of the potentialities which cosmic structure permits. He observes: "He can fulfil himself, of course, by the principle of emergence—by complicating nature far more than it has even been complicated before. Just as the brain of man, for example, is an elaboration of bio-chemical and neuro-physiological realities to a degree very much more intricate than is known to exist anywhere else in the universe, so it is entirely possible that

[1] *Man's Emerging Mind*, pp. 292, 296.

man's psychological and social nature may represent refinements and elaborations, cosmic potentialities, cosmic trends as yet unparalleled elsewhere in the known universe."[1] Similarly the scientist Oppenheimer thus unfolds the vistas of human advance in the twentieth century : "This is, inevitably and increasingly, an open and, inevitably and increasingly, an eclectic world. Our histories and traditions—the very means of interpreting life—are both bonds and barriers among us. Our knowledge separates as well as it unites; our orders disintegrate as well as bind; our art brings us together and sets us apart. Never before today has the integrity of the intimate, the detailed, the true art, the integrity of craftsmanship and the preservation of the familiar, of the humorous and the beautiful stood in the more massive contrast to the vastness of life, the greatness of the globe, the otherness of people, the otherness of ways and the all-encompassing dark. This balance, this perpetual, precarious, impossible balance between the infinitely open and the intimate this time—our twentieth century—has been long in coming, but it has come. It is, I think, for us and our children, the only way.[2]

Man's Open, Cosmic Mind and Mankind-as-a Whole

Instinctively and unconsciously man perpetually seeks and maintains a biological and mental integrity, balance and creativeness in his cosmos. Even in dream and reverie he creates an order and harmony out of the chaos and confusion of sensory instinctual impressions, desires and feelings, and a stable meaning, attitude and value out of the fluctuating sequential mass of experiences and behaviour. Beauty is born of the harmonious balancing of his organic and mental rhythms of desire and satisfaction, and resistance and mastery, and the ambivalences and conflicts of love and hate, creation and destruction. The apprehension of beauty establishes order and unity of all the given elements of the cosmos and his inner life by their integration and harmony. Beauty is indeed the authentic reflection in the ideal dimension of his psycho-biological integration, balance and homeostasis. His mind, personality and values as these wander from the immediate life-situation into space and time, weave enduring patterns of harmony and beauty in which the various happenings and experiences, past, present and anticipatory, and the various dimensions of meaning, experience and value, biological, social and transcendent, are fused together. There is also another kind of harmonious fusion, another dimension of expression and recognition of beauty, the integration of each man's own meaning, experience and value with those of fellowmen for purposive adaptation, control and direction in the most extensive and open community that he can imagine and inhabit. Due to human memory, imagination,

[1] See *Human Potentialities*, p. 300.

[2] *Prospects in the Arts and Sciences*, Lecture at the Columbia University Bi-centennial Celebration, 1955.

contemplation, aesthetic appreciation and speculative anticipation, human life-situation and adaptation constantly enlarge and deepen themselves in space and time and in dimensions of experience. Man's evolutionary advance implies a push forward in several dimensions of time and experience. All that has occurred, that occurs and that will occur, and that at the biological, social and transcendent levels of adjustment, obtain herein their full meaning and value. His progress is progress in both his inner and outer harmony, in his orderly adjustment and behaviour, as individual, as society and as mankind, and, finally, in his harmonious realisation as the historical individual of the unity and the continuity of the entire heritage of civilization. The integration, enrichment and refinement of human values and personalities, and of specific societies and civilizations embody themselves in cosmic mind and global culture that are the dual end-results of the cosmic evolutionary process. Human evolution, beyond-biological in its dimension and global in its range and scope, is measured by the development of open, cosmic mind in every society and nation, and its full creative expressions in infinitely open, transcending patterns of beauty, goodness and compassion and the integration and functioning of mankind-as-a whole, ethically and spiritually. Only a total advance of cosmic meanings, values and experiences can enlist his full powers and unrealised potentialities: all as integral to the transcendent, cosmic modes of his existence and transformation.

The Bio-Philosophical Theory of Open Evolution

In every field it is not limited, specific, fragmentary or instrumental, but intrinsic, universal and cosmic notions and values that lead to his fresh evolutionary advance through new moral relations, new personality structures, new unifications of cosmic mind. Open, transcendent evolution is the way of realisation of new potentialities of, and for the self-transcending human nature. For human evolution we have, therefore, preferred the phrase "transcendent" evolution to "emergent" evolution.

Contemporary thought, concerning the phenomena of the universe and man's relations to them, is being revolutionised by the philosophies of science and biology. Modern physics now tells us that the events of nature exist as a pattern in the human mind in which the present, past and future comprise a continuum. These are on-moving, having neither a beginning nor an end. The process or activity, physical and mental, is, in Whitehead's famous phrase, the actuality. The organism is no longer regarded as something concrete with specific structure and organisation and with particular physical boundaries, but is a continuous pattern ever transforming itself in a four-dimensional universe. Space and time fuse themselves in the organism, in the human mind, personality and values, and in the cosmos as one all-comprehensive, transcendent whole. The individual merges in society, society merges in mankind-as-a whole, and mankind merges in

cosmos-as-a whole, sequentially extending its horizons in space and time until life and organisation become one all-inclusive whole. Human evolution is an open episode, only a very recent open episode of the whole development of matter, life and mind in which the past is eternally present and the future is always immanent. Fundamentally this is the bio-philosophical theory of open, "transcendent" evolution.

It is much more than a theory, for basically it is human mind's intuitive understanding and aesthetic appreciation of the unity, continuity and transcendence of life in all its dimensions. It is the transcending quality of evolution of matter, energy and life which ever broadens it in space, and deepens and intensifies it in time, so as to create in the human brain and mind the wholeness, beauty and transcendence of the cosmos. Not merely human knowledge and insight but also human love, appreciation and adventure are necessary for a representation, however, imperfect, of this on-going, majestic process of evolution, shaping the order, harmony and unity of the cosmos that are built into the human mind as truth, goodness and beauty.

The Pre-Ordained Harmony of Cosmos and Man

Leibniz conceives of the "pre-ordained harmony" of the cosmos which is also the stuff of the human brain and mind. Oppenheimer, speaking of the unsolved problems in nuclear physics, refers to the maze of findings that cannot be reduced to an orderly concept of the physical world. But he observes that "always in the past there has been an explanation of immense sweep and simplicity and in it vast detail has been comprehended as necessary. Do we have the faith that this is inevitably true of man and nature? Do we have the confidence that we shall have the wit to discover it? For some odd reason, the answer to both questions is, Yes." Unity, harmony and beauty are as much within the human person as in the cosmos. The process which focusses this before human consciousness is open, transcendent evolution. Evolution has no doubt, a cosmic, transcendent quality underlying the whole sequential pattern from the system of atoms and stars to galaxies, and from the system of cells and organisms to human bodies, minds and values. Consciousness recognises, sustains and cherishes as supreme beauty not any particular pattern but the universal, transcending, harmonising or patterning *principle* embodied in the eventuations of the cosmos.

Cosmic Mind and Values

Beauty emerges in consciousness as *awareness*, as *feeling* and as *creation* of harmony or wholeness, which are but three aspects of the fundamental essence of the cosmic that are abstracted separately for convenience by the human mind. Man's experience of beauty in "transcendent" evolution not only enlarges his empirical veracity, but becomes the passion of

his living in hope, love, goodness and compassion. The transcending attribute of cosmic evolution captures, moulds and directs his brain and mind, many of whose activities are, no doubt, essential for his survival, but many leaping to a higher dimension of experience can neither be foreseen, nor predicted, nor defined. Such is the amazing transformation of animal mind and values into Cosmic Mind and Values, achieved consciously in man's evolution and associated with his individual fulfilment, happiness and perfection. "Transcendent" evolution may be accepted as the art and religion of twentieth century man, refining and enriching the creative, forward-oriented and open aspect of his nature and strivings, liberating his mind and spirit from the pressures and compulsions of an all-engulfing social organisation, and the ego-centricity, greed and aggressiveness of his animal nature, and building up an open moral community unlimited in its range and depth.

In contrast with the animal the modes of human self-actualisation and self-transcendence are pertinent not only to man but to mankind and cosmos-as-a whole. The key to transcendent human evolution is Cosmic Mind, Cosmic Purpose and Cosmic Will, man's obligation and adventure to perfect all that there is in the cosmos, to the stuff and substance of which he essentially belongs. His creative, open, symbolising and evaluating mind fundamentally differs from the mind of the animal in that it always transcends the immediate given moment, environment and opportunities. As it matures in response to the wider and wider environment and its stimuli and promises, it evolves into the Cosmic Mind that transcends the conscious mind. The Cosmic Mind is the ideal of the highest possible human wholeness, harmony and beauty, the *summum bonum* which penetrates into the core of human nature. It is no vague fancy, but demands realisation giving a new status and dignity to human values, strivings and evolution. Through the farthest aspirations of harmony, beauty and goodness the Cosmic Mind approximates in contents to the Reality, with which man identifies himself in various degrees according to his mental and spiritual trends and capacities—the harmonious cosmic whole that he can grasp.

Closed versus Open Evolution

Encrusted and governed by the narrow loyalties of his family, class and nation, man, however, sins against evolving open life, mind and society. He then becomes the stupendous burden of the evolutionary process, struggling as he does with all his intelligence and skill to block and circumscribe it. The life of the individual, integrated and deepened, and the life of the cosmic, broadened and intensified, are two facets of the same absolute adventure. Open, transcendent evolution reveals at once a steady improvement in the uniqueness, productiveness and expansiveness of all individuals and the ceaseless unification of the Cosmic Mind. The Bergsonian vision that the human mind transcends immediacy through its

memory of the past and anticipation of the future, and is capable of organising by a kind of integration the environing events and possibilities presented to it, thereby undoing the dissipation demanded by the Second Law of Thermo-dynamics, reveals the true meaning and promise of cosmic evolution. As W. P. Montague puts it, "Nature in the course of evolution is actually attaining a richer and more completely organised system of its energy in the realm of mentality. The day will come when science will supplement its many discoveries of the katabolic processes, which reveal the operation of the law of entropy, by a discovery of the essentially anabolic processes which are at present revealed only in the growth of individuals and only to their introspection. We should then have a second and greater volume of scientific revelation in which the Bergsonian philosophy would be demonstrated."[1]

The Cosmic Mind mirrors the meaning, purpose and direction of transcendent evolution. The evolution of life and the evolution of mind are identical—the fruit of a Cosmic Imagination and Vision. The Cosmic Mind reveals a cumulative system of memories and ordering of the series of episodes of the past, experienced and evaluated together. Due to its capacity to build into itself an ever richer and more extensive organisation in constant interaction with the enlarging environment and its events and values, it keeps cosmic evolution always moving and striving in its unending venture.

Man's Completion of the Cosmos

Life and mind, as we see them in the cosmic evolutionary process, are full of backslidings, defeats and sufferings. On both, life and mind, is imposed the limitation that their fulfilments rest on bafflements, miseries and despairs. Man having reached the summit of evolution cannot forget the anxieties and pains, defeats and miseries of a thousand humbler fellow-creatures that represent the price of his own survival and progress. His own mind, even as it apprehends the endless vistas of cosmic progress, is shot with conscious and unconscious anxieties, frustrations and disillusionments. The universe collects a vast, measureless pool of sweat, blood and tears of sentient creatures that suffer defeat, agony and death in the struggle for survival. Buddhism was right when it declared that in the universe of a single moment the tears of mankind gathered together would be larger and deeper than all the seas and oceans of the earth. Through endless misery and suffering cosmic evolution, however, registers a continuous improvement of dimensions, and patterns of systems that articulate into more complex wholes, richer organisations of life and more inclusive transcendences. Transcendent evolution completely reverses the natural trend towards the dissipation of energy. Inanimate Nature, in the course

[1] *Great Visions of Philosophy*, p. 470.

of evolution, reaches a more completely organised pattern of its energy in the realm of Life. This synthetic ordering, organising and completion of the parts with one another in the realm of Life gives us the patterns of Mind and Value, glimpses of Cosmic Imagination and Purpose regulating the entire on-going process. It is the Cosmic Mind which embodies itself in this universe in the supreme traditional unity of absolute, transcendent values, Truth, Beauty and Goodness. From the cosmic fancy have emerged endless possibilities of material and organic existence, some trivial, others significant, some inept, others efficient, some infertile, others teeming, some parasitical, ugly and horrible, others noble, self-transcending and angelic. Out of these possibilities, the patterns or organisations of life, behaviour, personality and values articulate themselves through the successive levels of matter, life and mind, and this is called Evolution.

The Beauty of Evolution

Evolution transcends itself because of the immanence in it of both past and future. In so doing it discovers and articulates harmony, balance, order and goodness from which the human mind sublimates, abstracts and generalises Beauty. The supreme Beauty of evolution lies in the latter's pledge for the future. The stability, harmony, wholeness and transcendence of the patterns, which, indeed, intimate the potentialities of evolution, are conditions of the creation and realisation of Beauty.

Beauty is the stamp in the realm of organisms of stability and rhythm of their growth and orderly physiological processes and activities that express themselves in arrangements and combinations of lines, curves and colours, often having a biological significance and standing the tests of sifting and selection. There are artistic unity and harmony in the make-up and architecture of an orchid, a lotus, a shell, a coral-reef fish, a butterfly, a peacock, a Bird of Paradise, a rattle-snake or a Royal Bengal tiger. Ugliness and horror are usually associated with the parasitic, the domesticated, the incomplete or embryonic and the diseased.[1] While man's unconscious standards and norms of line and colour, sound and movement are derived from the successful and complete expressions of organic life, growth and maturation surrounding him, he himself is an artist in so far as he must unconsciously or deliberately achieve order and harmony in his own organic and affective life.

Beauty is not a chance by-product of his evoluion, but the perennial and universal echo of his harmonious and integral internal and external adaptedness. It is a thoroughly integral body-and-mind feeling which is associated with essential, formative and transcendent patterns. This integralness of his body-mind feeling in his sense of Beauty explains why the object of Beauty excites his reflective mind as well as the centres ruling

[1] Compare J. A. Thomson: *The System of Animal Nature*, Vol. I, pp. 275-278.

the viscera, inducing a diffused bodily rapture and resonance. Man's visceral needs, the responsive thrill of his psycho-physical processes to the balance and rhythm of the cosmos, his emotional urges of love, creation and fullness, and his intellectual and metaphysical strivings after order and harmony are all involved in his sense of Beauty. In the course of human evolution Beauty emerges as the orientation and elaboration of human notions, feelings and values into the universal, transcendent dimension. These achieve the identification of the human being with all his complex organs, tissues, skills and sensitivities with the structure and rhythms of the cosmos surrounding him. Beauty opens to man at his best something which reason and intellect cannot convey, but an empathic response to the harmony, wholeness and transcendence of cosmos and life. The human body and mind find these as expressions of basic trends in cosmos and in self, both belonging to the same stuff.

Beauty is sensed and created by man not merely in the sublimations of his vision, sound and touch, but also in his meaningful behaviour and experiences, wherever the patterns and movements reveal attributes of wholeness and transcendence. These are the evolutionary goals or purposes sought by the human mind, investing the latter with the teleological and purposive character it manifests.

Man fulfils his nature more and more as he discovers the basic structure and trends of the cosmos, and becomes a macrocosm in many fundamental respects. The supreme revelation of his deep affinities with the cosmos come primarily from the identification of his own meanings, values and purposes with those of society and of cosmos as the society of societies. "The universe," as Whitehead says, "achieves its value by reason of its co-ordination into societies of societies. Also all of these societies presuppose the circumambient space of social physical activity." For the finite mind of man, society is the most complete, yet self-transcending epitome and model of value-creation and value experience. Man who is begotten by society, internalises society in his mind and heart. He perceives its ubiquitous presence in the cosmos in all its dimensions, and projects into the latter all the transcending values that society creates, deepens and expands for him—values not possible for him to experience outside society. Because of society which makes possible all beauties, truths, goodnesses, harmonies and sublimities of life that, otherwise, cannot exist, the universe becomes saturated with patterns, linkages, connections and values.

"Beauty is truth, truth beauty," exclaims Keats. But Whitehead's is a surer judgment, viz., Beauty is a wider and more fundamental notion than Truth. The teleology of the universe, according to him, is directed to the production of Beauty. Beauty is self-justifying; while Truth derives its justification from its service to Beauty; the promotion of Beauty of feeling and goodness is a qualification belonging to the constitution of Reality,

the real world being good when it is beautiful.[1] Man's surrender to Beauty is his affirmation of the universal ordering, harmonising and transcending trends of cosmos, life and mind, and acknowledged by him in his own nature.

The Sense of Beauty as Unity, Sublimity and Compassion

The human body, brain and mind being integral parts of the cosmos as any atom and star, crystal and galaxy, the universal transcendent attribute of evolution is woven into their fabric. Beauty is apprehended both as basic, self-justifying feeling and creation within man, and recognized and appreciated without in life, society and cosmos. It is acknowledged when philosophical or scientific speculation envisages an orderly, indivisible, simplified plan of the cosmos, and this is called Unity, Harmony or Truth. It is perceived when the imponderable rhythm of poetry and music, painting and sculpture, the secret influence of a living Master (Avatara or Guru), the impact of a sacred formula (mantra) and method of synthesis, and the dialectical march of detached, elevated contemplation bring to a halt the ebb and flow of consciousness, and this is called Sublimity. It is realised when love transcending the narrow boundaries of two persons spills into the heart of humanity at large, and this is called Compassion or Reverence. The sense of Beauty gives man direct access to Reality with immediacy of experience in each case, whether as Unity, or as Sublimity, or as Compassion. As Kant says, "Beauty arouses and enhances man's whole psychic life, his emotions, conations and cognitions, in a harmonious integrated way." Man who is the handiwork of God and made in His image becomes at the same time the Divine artist through his contemplation and realisation of the cosmos-as-a whole. The unfolded universe is the reflection of the Divine artist. The Indian sage Sankaracharya uses the following beautiful metaphor: "On the vast canvas of the self the picture of the manifold worlds is painted by the self itself and that supreme Self itself takes delight in witnessing it."

The experiences of Beauty, Unity, Compassion and Sublimity are found fused together, generating the same kind of transcending emotions and sentiments of self-competence, joy, charity and hope with similar kinds of kinesthetic and organic changes. In external nature orderliness, wholeness and harmony are embodied in rhythm. In man order and harmony are secured and acknowledged by the inclusive and integral experiences of Beauty, Wholeness and Compassion or by the experiences of exclusion, negation and withdrawal as in the sense of Sublimity. Santayana says that the pleasures of Sublimity or Unity achieved by exclusion, opposition and isolation are cold, imperious and keen, but the pleasures of Beauty or Unity by inclusion are warm, passive and pervasive.[2] Beauty always more than

[1] Whitehead: *Adventures of Ideas*, pp. 341-345.
[2] *The Sense of Beauty.*

morality speaks through solicitude, compassion and reverence over infinite, ever-receding reaches of human understanding, appreciation and care. It is the uniqueness of human imagination to embrace the whole cosmos in its vision of unity, harmony and beauty, and to extend and intensify unlimitedly the sweep of its love, solicitude and compassion.

Man can neither define nor prove Beauty, but imagines, feels and lives it as he discovers unlimited stretches of unity, and experiences immeasurable ranges of love and compassion. He languishes and dies wherever he hinders and kills Beauty. He leaps towards all his potentialities as he creates Beauty wherever he can, and thereby also enriches society, mankind and cosmos.

Human Imagination, Feeling and Purpose in Evolution

This marvellous and strange cosmos with its vast galaxies and its microscopic universes of neutrons and protons in the physical world, its infinite disasters and mute agonies of creatures that have gone to the wall in the biological world, and man's recurrent defeats and triumphs in the psycho-social world becomes essentially beautiful, meaningful and worth while for him as he can transcend himself, acknowledging and realising the supreme values of the transcendent quality within himself and without in all of nature. Then can he even seek fellowship and participation with God in the creation and transformation of the cosmos. How much compassion is breathed by these lines from Darwin: "If we choose to let conjecture run wild, then animals, our fellow-brethren in pain, disease, suffering and famine—our slaves in the most laborious works, our companions in our amusements—they may partake of our origin in one common ancestor —we may be all melted together."[1] Thomas Hardy also makes the following noble observation: "And looking down the future these few hold fast to the same: that whether the human kindred animal races survive till the exhaustion or destruction of the globe or whether these races perish and are succeeded by others before that conclusion comes, pain to all upon it, tongued or dumb, shall be kept down to a minimum by loving kindness, operating through scientific knowledge, and actuated by the modicum of free will conjecturally possessed by organic life when the mighty necessitating forces—unconscious or other—that have "the balancing of the clouds," happen to be in equilibrium, which may or may not be often."[2]

Man's transcendent aspirations acquire the sense of creating something in the cosmos that but for them simply cannot exist. He who is finite and time-bound dares to become infinite and universal, a co-partner with God in the process of creation. The evolution of the cosmos reveals a steady increase of participation of creatures in the impulse and will of the Creator. Animal life is the laboratory in which Nature has experimented

[1] *Life and Letters of Charles Darwin*, Vol. 2, p. 6.
[2] *Apology*.

for ushering in the symbolising, evaluating and transcending creature—man. Human life has now become the laboratory in which Nature is experimenting for the emergence of cosmic mind and values that make man God's participant in the world-process. His imagination and purpose come to identify themselves with Cosmic Imagination and Purpose. The silent fear, anxiety and bewilderment of the evolutionary process, the trial and agony of the vanquished and defeated can then be overborne by the joy and hope of Beauty and Goodness, finite man's nearest approach to Being. In such contemplation of the evolutionary process with its eternal possibilities of both values and disvalues that coexist in Being, his mood is chastened. In Being there are contrarieties, though these do not *belong* to Being, and hence the universe happens to be so constituted that fulfilment and defeat, joy and suffering, goodness and evil alternate with one another.

In the phraseology of the Vedanta evil and suffering, defeat and ignorance are Maya which is the inscrutable Sakti of the Brahman. Maya or relativity represents the possibility for Being of not being. If evil, suffering and discord be excluded from possibility, Being would not be Being. Cosmic evolution is a consequence of the infinitude of Being. Like Maya it is without beginning or end, and displays the alternation of good and evil, actualisation and retrogression. The disharmonies, discords and disvalues of life need to be harmonised through the unceasing process of evolution. The process of cosmic evolution ultimately eliminates that in Being which is not being. Is this not strikingly analogous with the ancient Indian concept of God Siva as the Lord of Dance, who dances in the universe and in the minds of man, and whose footfalls are the alternations of creation and destruction, anabolism and katabolism, goodness and evil, grimness and hope, advance and regression?

Modern value theory in the West is beset by the harsh dualisms of objective-subjective, absolute-relative and coercive-individualistic. The dilemmas can be resolved only by an exploration of the continuity between man and universe, the social order and the cosmic order, and relating the value doctrine to a new metaphysic of Being and Becoming that is less anthropomorphic and society-centred, and more universalist and more cosmic. As Charles Hartshorne observes: "The only way to avoid a certainly false, purely self-interest theory of motivation, and at the same time do justice to the principle that value lies in concrete individual satisfaction, not in mere collection, is to recognise a superhuman mind. If this includes the sum of being, if it be the cosmic mind, then the problem is solved, since such a mind would indeed find satisfaction in the satisfaction of all, for all would be integral parts of its own body, whose health would be inseparable from the prevailing health of its own parts." Man through his identification with Cosmic Mind finds the evolu-

tionary process shot through with enlarging, transcendent meaning and purpose. These become his own meaning and purpose. He takes charge of the future evolutionary advance and makes sacrifices unimagined in his life-history in the past—the fruits of his Cosmic Feeling and Imagination. The cosmos is yet to reach complete harmony and perfection: it is yet replete with discord and evil, untruth and ugliness. Only man's self-transcending, goodness and compassion, truth and beauty can achieve the richest possible harmony and perfection of the cosmos in the future. The creation and realisation of his transcendent values alone make the cosmos possible.

SELECTED BIBLIOGRAPHY

AGAR, W.E.—A Contribution to the Theory of the Living Organism, University Press, Melbourne, 1943.

Allee, W.C.—Cooperation among Animals, with Human Implications, Schuman, New York, 1951.

————and Others—Principles of Animal Ecology, Saunders, Philadelphia, 1951.

———The Social Life of Animals, Pitman, London, 1951.

ALLPORT, G.W.—Becoming, Yale University Press, 1955.

———Eidetic Imagery, British Journal of Psychology, XV.

ANSHEN, R.N. (Ed.)—Science and Man, Harcourt, New York, 1942.

ASHBY, W.R.—Design for a Brain, Wiley, New York, 1952.

AUGUSTA AND BURIAN—Pre-historic Man, Hamlyn, London, 1960.

BACON, A.—Man's Next Billion Years, Exposition Press, New York, 1959.

BAGEHOT, WALTER—Physics and Politics, Appleton, New York, 1873.

BARNETT, S.A. (Ed.)—A Century of Darwin, Harvard University Press, 1958.

BEACH, FRANK, A.—The Descent of Instinct, Psychological Review, 62.

BECK, W.S.—Modern Science and the Nature of Life, Harcourt, 1957.

BERGSON, H.—Creative Evolution, Macmillan, London, 1911.

———The Two Sources of Morality and Religion, Henry Holt and Company, New York, 1935.

BERRILL, N.J.—Man's Emerging Mind, Dodd, Mead, New York, 1955.

BERTALANFFY, L. v.—Problems of Life, Wiley, New York, 1952.

———An Outline of General System Theory, The British Journal of the Philosophy of Science, 1930.

———A Biologist Looks at Human Nature, The Scientific Monthly, vol. 82, 1956.

———The Theory of Open Systems in Physics and Biology, Science, III, 1950.

BEVAN-BROWN, C.M.—The Sources of Love and Fear, Vanguard, 1950.

BOUGLE, C.—The Evolution of Values, Holt, New York, 1926.

BOULE, M. AND VALLOIS—Fossil Man, Dryden, 1957.

BOWLBY, J.—Maternal Care and Mental Health, World Health Organization, Geneva, 1951.

BOYD, W.C.—Genetics and the Races of Man, Blackwell, 1951.

BRIDGMAN, P.W.—The Logic of Modern Physics, Macmillan, New York, 1927.

BROWN, HARRISON—The Challenge of Man's Future, Secker and Warburg, London, 1954.

BRUMWELL, J.R.M. (Ed.)—This Changing World, Routledge and Sons, 1944.
BUCKE—Cosmic Consciousness, Dutton, 1923.
BURNETT, W. (Ed.)—This is My Philosophy, Harper, 1957.
BURR, H.S.—Field Theory in Biology, Scientific Monthly, 1947.
———and Northrop, F.S.C.—The Electro-dynamic Theory of Life, Quarterly Review of Biology, 10, 1935.
BURROW, T.—Science and Man's Behaviour, Philosophical Library, New York, 1953.
BURT, C.L.—Intelligence and Fertility, Hamilton, 1946.
BUXTON, L.H. DUDLEY—Primitive Labour, Methuen & Co., 1924.
CANNON, H.G.—The Evolution of Living Things, University Press, Manchester, 1958.
CANNON, W.B.—The Wisdom of the Body, Norton, New York, 1952.
———The Body Physiologic and the Body Politic in Anshen (Ed.): Science and Man, Harcourt Brace and Company, New York, 1942.
CARMICHAEL, L. (Ed.)—Manual of Child Psychology, Wiley, New York, 1954.
CARPENTER, C.R.—A Field Study of the Behaviour and Social Relations of Howling Monkeys, Comp. Psychol. Monograph, 10(2), 1934.
———Comparative Psychology Monograph, vol. x.
CARTER, G.S.—Animal Evolution; A Study of Recent Views of its Causes, Sidgwick and Jackson, London, 1951.
———A Hundred Years of Evolution, Sidgwick and Jackson, London, 1957.
CASSIRER, ERNST—An Essay on Man, Doubleday Anchor Books, New York, 1956.
CHANCE, E.P.—Truth About the Cuckoo, Scribner, 1941.
CHANCE, M.R.A. AND MEAD, A.D.—Social Behaviour and Primate Evolution, Symposia of the Society for Experimental Biology, vol. vii, 1953.
COON—Human Variability and Natural Selection, American Naturalist, September-October, 1955.
COUNT, EARL, W. (Ed.)—This is Race, Schuman, 1950.
———The Biological Basis of Human Sociality, American Anthropologist, LX, 1958.
DARLINGTON—Control of Evolution in Man, Nature, 1948.
———The Facts of Life, Allen and Unwin, 1953.
DARWIN, C.—The Descent of Men, Murray, London, 1871.
———The Expression of the Emotions in Man and Animals, New Edition, Philosophical Library, New York, 1956.
DAVIS, RUSSELL—Some Applications of Behaviour Theory in Psychopathology, British Journal of Medical Psychology, 1954.

DAY, CLARENCE S.—This Simian World, Knopf, 1948.
DE BEER—Embryos and Ancestors, Toronto, Oxford, 1951.
DE CHARDIN, PIERRE—The Phenomenon of Man, Harper, New York, 1959.
DEWEY, J. and BENTLEY, A.F.—Knowing and the Known, Beacon Press, Boston, 1948.
DOBZHANSKY, T.R.—The Biological Basis of Human Freedom, Columbia University Press, 1956.
DRUMMOND, H.—The Ascent of Man, Hodder and Stoughton, London, 1894.
DURKHEIM, E.—Suicide, Glenco, Ill, Free Press, 1951.
EISSLER, R.S. an others—The Psycho-analytic Study of the Child, International Universities Press, 1945.
ELSASSER—The Physical Foundation of Biology, Pergmon, 1958.
EMERSON, A.E.—Dynamic Homeostasis : a Unifying Principle in Organic, Social and Ethical Evolution, Scientific Monthly, vol. 78, 1954.
———Homeostasis and Comparison of Systems in Grinker (Ed.): Towards a Unified Theory of Human Behaviour, Basic Books, 1956.
———Social Cordination and the Superorganism, American Midland Naturalist, 21, 1939.
ERIKSON, E.H——Childhood and Society, Norton, New York, 1950.
ETKIN—Social Behaviour and the Evolution of Man's Mental Faculties, American Naturalist, May-June, 1954.
Feibleman—Theory of Integrative Levels, British Journal of the Philosophy of Science, 1954.
FLUGEL, J.C.—Man, Morals and Society, Duckworth, 1956.
———The Psycho-analytic Study of the Family, Hafner Publishing Co., Clarke, Irwin, 1948.
FREUD, ANNA—The Ego and the Mechanisms of Defence, Hogarth Press, London, 1948.
FREUD, S.—Complete Psychological Works, Edited by Strachey and Others, Hogarth Press, London, 1953.
FROMM, E.—The Sane Society, Rinehart, New York, 1955.
———The Art of Loving, Harper, New York, 1956.
GAVAN, J.A.—The Non-human Primates and Human Evolution, Wayne University Press, 1955.
GEDDES AND THOMSON—Life : Outlines of Biology, Williams and Norgate, London, 1931.
GERARD, R.W.—Physiology and Psychiatry, American Journal of Psychiatry, 106, 1949.
———AND EMERSON, A.E.—Extrapolation from the Biological to the Social Science, 101, 1945.
GINSBERG, M.—Moral Progress, Glasgow University Press, 1944.

GLASS, BENTLEY—A Biological View of Human History, Scientific Monthly, 73, 1951.

GOLDHAMER, H. AND MARSHALL, A.W.—Psychosis and Civilization, Glenco, Ill. Free Press, Austin, 1953.

GOLDSTEIN, KURT—Human Nature in the Light of Psycholopathology, Harvard University Press, Cambridge, 1951.

———The Organism, American Book, 1939.

GOUDGE, T.A.—The Ascent of Life, Allen and Unwin, 1961.

HALLIDAY, J.L.—Psychosocial Medicine; A Study of the Sick Society, Norton, New York, 1948.

HARDIN, GARNETT—Nature and Man's Fate, Rinehart, New York, 1959.

HART, S.L.—Treatise on Values, Philosophical Library, 1949.

HAYES, C.—Ape in Our House, Harper, 1951.

HENDERSON, L.J.—The Order of Nature, Harvard University Press, 1917.

HENLE, PAUL—The Status of Emergence, Journal of Philosophy, 39, 1942.

HENRY, JULES—Homeostasis, Evolution and Culture, Scientific Monthly, vol. 81, 1955.

HERRICK, C.J.—The Evolution of Human Nature, University of Texas Press, 1956.

HOCKING, W.E.—The Coming World Civilization, Allen and Unwin, 1958.

HOOTON—Up From the Ape, Macmillan, 1946.

HOWELLS—Mankind So Far, Doubleday, 1944.

HUXLEY, A.L.—Brave New World Revisited, Harper, New York, 1941.

HUXLEY, JULIAN—The Humanist Frame, Allen and Unwin, 1962.

HUXLEY, J.S.—Man in the Modern World, New American Library, New York, 1944.

———Evolutionary Ethics, Oxford University Press, 1943.

———Evolution in Action, Harper & Bros., New York, 1953.

———Man Stands Alone, Harper & Bros., New York, 1941.

———The Uniqueness of Man, Chatto and Windus, 1941.

———and others (Ed.)—Evolution as a Process, Allen and Unwin, 1954.

HUXLEY, T.H. AND HUXLEY, J.S.—Touchstone for Ethics, Harper, New York, 1893-1943.

JENNINGS, H.S.—The Biological Basis of Human Nature, Norton, 1930.

JONES, E.—The Life and Work of Sigmund Freud, vol. I, Basic Books, New York, 1953.

KATZ, DAVID—Animals and Men: Studies in Comparative Psychology, Longmans, New York, 1937.

KEITH, ARTHUR—A New Theory of Human Evolution, Philosophical Library, New York, 1949.

KLAATSCH—The Evolution and Progress of Mankind, Stokes, 1923.

KLUCKHOHN, C.—Mirror for Man, Whittlesey House, New York, 1949.

———AND MURRAY, H.A. (Ed.)—Personality in Nature, Society and Culture, Knopf, New York, 1953.

KOHLER, W.—The Place of Value in a World of Facts, Liveright Publishing Co., New York, 1938.

KROEBER, A.L. (Ed.)—Anthropology Today, University of Chicago Press, 1953.

———On Human Nature, Southwest Journal of Anthropology, XI, 1955.

Kropotkin, P.—Mutual Aid, Phillips, New York, 1962.

KRUSE, H.D. (Ed.)—Integrating the Approaches to Mental Disease, Hoeber-Harper, New York, 1957.

KURTZ—Human Nature, Homeostasis and Values, Philosophy and Phenomenological Research, vol. xvii, 1956-57.

LA BARRE, WESTON—The Human Animal, University of Chicago Press, 1954.

LEARY, L.G. (Ed.)—The Unity of Knowledge Doubleday, 1955.

LE GROS CLARK, W.E.—The Fossil Evidence for Human Evolution, University of Chicago Press, 1955.

LEIGHTON, A.H. et al (Eds.)—Explorations in Social Psychiatry, Basic Books, New York, 1957.

LINDZEY, G. (Ed.)—Handbook of Social Psychology, Addison-Wesley, 1954.

MACHEAN, PAUL—Psychosomatic Disease and the Visceral Brain, Psychosomatic Medicine II.

MASLOW—Motivation and Personality, Harper, 1954.

———Cognition of Being in the Peak Experiences, Journal of Genetic Psychology, 1959.

———(Ed.)—New Knowledge in Human Values, Harper, New York, 1959.

MATTHEWS, G.V.T.—Bird Navigation, Cambridge University Press, 1955.

MCCARY, J.L. (Ed.)—Psychology of Personality, Lagos Press, New York, 1956.

MCKINLEY, G.M.—Evolution: The Ages and Tomorrow, Ronald Press Co., New York, 1956.

MEDAWAR, P.B.—The Uniqueness of the Individual, Methuen, London, 1957.

MONTAGU, A.—The Direction of Human Development, Harper, New York, 1955.

———Darwin, Competition and Cooperation, Schuman, New York, 1952.

———Anthropology and Human Nature, Porter Sargent, New York, 1957

MONTAGUE, W.P.—Great Visions of Philosophy, Paul Carus Foundation Lectures, Open Courts, 1950.

MORGAN, C.L.—Emergent Evolution, Holt, New York, 1926.

———Animal Behaviour, Encyclopaedia Britannica, 1943.

MORRIS, CHARLES,—Varieties of Human Values, University of Chicago Press, 1956.

MUENSTERBERGER—On the Biopsychological Determinants of Social Life, Psychology and Social Sciences, vol. iv.

MUKERJEE, R.K.—The Philosophy of Social Science, Macmillan, 1960.

———Social Ecology, Longmans, 1948.

———Regional Sociology, Century Co., New York, 1926.

———The Political Economy of Population, Longmans, 1945.

———The Dynamics of Morals, Macmillan, London, 1952.

———Population and Human Values, in Proceedings of International Conference for Planned Parenthood, 1959.

———The Social Structure of Values, Macmillan, 1950.

MULLER, H.J.—Man's Place in Living Nature, Scientific Monthly, 84, 1957.

———Out of the Night: A Biologist's View of the Future, Vanguard Press, 1935.

———Man's Future Birthright, University of New Hampshire, Durham, 1958.

———Human Values in Relation to Evolution, Science, 1958.

———The Darwinian and Modern Conception of Natural Selection, Proceedings of the American Philosophical Society, 93, 1949.

Mumford, Lewis—The Conduct of Life, Harcourt, 1951.

MURPHY, G.—Human Potentialities, Basic Books, New York, 1958.

———Personality, Harper, 1947.

NEEDHAM, J.—Time: The Refreshing River, Allen and Unwin, London, 1943.

———History is on Our Side, Allen and Unwin, London, 1946.

NEUMANN—The Origins and History of Consciousness, Pantheon Book, 1954.

NORTHROP, F.S.C.—The Logic of the Sciences and Humanities, Macmillan, New York, 1947.

———Philosophical Anthropology and Practical Politics, Macmillan, 1960.

NOVIKOFF, A.B.—The Concept of Integrative Levels and Biology, Science, 101, 1945.

———Continuity and Discontinuity in Evolution, Science, 102, 1945.

OAKLEY, KENNETH—Tools or Brains, Listener, December 19, 1959.

———Man the Tool-maker, British Museum, London, 1950.

OPLER, M.K.—Culture, Psychiatry and Human Values, Springfield, Ill. Charles C. Thomas, 1956.

OSBORN, R.—Humanism and Moral Theory, Allen and Unwin, 1960.

PACKARD, V.—The Hidden Persuaders, Longmans, London, 1961.

PARSONS, E.C.—The Family, Putnam's Sons, London, 1912.

PENFIELD, W., AND RASMUSSEN, T.—The Cerebral Cortex of Man, Macmillan, New York, 1950.

RAPPORT, ANATOL—Science and the Goals of Man, Harper, New York, 1950.

REDFIELD (Ed.)—Lewels of Integration in Biological and Social Systems, Biological Symposium, vol. viii, 1942.

RIESE, W.—The Conception of Disease, Philosophical Library, New York, 1953.

ROE, A. AND SIMPSON, G.G. (Eds.)—Behavior and Evolution, Yale University Press, 1958.

ROHEIM, G.—Psycho-analysis and Anthropology, International Universities Press, New York, 1950.

ROHRER, J.H. AND SHERIF MUZAFER (Eds.)—Social Psychology at the Cross-roads, Harper, New York, 1951.

ROSTAND, J.—Can Man Be Modified? Basic Books, New York, 1959.

———A Biologist's View, Heinemann, London, 1956.

Russell, E.S.—The Directiveness of Organic Activities, Cambridge University Press, 1945.

RYLE, G.—The Concept of Mind, Hutchinson, London, 1949.

SANTAYANA—The Sense of Beauty, Scribner, 1938.

SCHELER, MAX—The Nature of Sympathy, Routledge and Kegan Paul, London, 1954.

SCHILLER, C.H. (Ed.)—Instinctive Behaviour, International Universities Press, New York, 1957.

SCHLIPP (Ed.)—The Philosophy of Alfred North Whitehead, Tudor Publishing Co., 1941.

SCHRODINGER—What is Life? Macmillan, 1945.

SELLARS AND OTHERS (Eds.)—Philosophy for the Future, Macmillan, New York, 1949.

SHERRINGTON, C.—Man on His Nature, Cambridge University Press, 1953.

SIMPSON, G.G.—The Meaning of Evolution, Yale University Press, 1949.

———The Major Features of Evolution, Oxford University Press, 1953.

SINGH, BALJIT (Ed.)—The Frontiers of Social Science, Macmillan, 1956.

SINNOTT, E.W.—Cell and Psyche: The Biology of Purpose, University of North Carolina Press, Chapel Hill, 1950.

———The Biology of the Spirit, Viking Press, New York, 1955.

———The Biological Basis of Democracy, Yale Review, 1945.

SOL TAX (Ed.)—The Evolution of Life, University of Chicago Press, 1960.

———The Evolution of Man, University of Chicago Press, 1960.

———Issues in Evolution, University of Chicago Press, 1960.

SPUHLER, J.N. (Ed.)—The Evolution of Man's Capacity for Culture, Wayne State University Press, 1959.

STRAUS, W.L.—The Riddle of Man's Ancestry, Quarterly Review of Biology, 24, 1949.
SULLIVAN, H.S.—Conceptions of Modern Psychiatry, William Alanson White Psychiatric Foundation, 1947.
SYMPOSIUM—The Future of Man, Seagram, New York, 1959.
SZEKELY—Man's Origin and the Latency Period, International Journal of Psychoanalysis, 1957.
TEITELBAUM—Homeostasis and Personality, A.M.A., Archives of Neurology and Psychiatry, 1956.
TINBERGEN, N.—The Study of Instinct, Clarendon Press, Oxford, 1951.
———Social Behaviour in Animals, Wiley, New York, 1953.
THOMAS, W.L. (Ed.)—Man's Role in Changing the Face of the Earth, Wenner Gren Foundation, Chicago, 1956.
THOMSON, J.A.—The System of Animal Nature, Williams and Norgate, London, 1920.
THORPE, W.H.—Some Implications of the Study of Animal Behaviour, Scientific Monthly, June, 1957.
———Learning and Instinct in Animals, Methuen, 1956.
TOCH, H.H. AND HASTORF, A.H.—Homeostasis in Psychology, Psychiatry, 1955.
TROTTER, W.—The Instincts of the Herd in Peace and War, Macmillan, 1926.
VON FRISCH—Bees, Their Vision, Chemical Senses and Language, Cornell University Press, 1950,
———The Dancing Bees, Harcourt, 1955.
WADDINGTON, C.H.—Strategy of the Genes, Allen and Unwin, 1957.
———Science and Ethics, Allen and Unwin, London, 1942.
———Evolutionary Systems-Animal and Human, Proc. Roy. Inst., 1959.
———The Ethical Animal, Allen and Unwin, London, 1960.
WEIDENREICH—Apes, Giants and Man, University of Chicago Press, 1946.
———The Trend of Human Evolution, Evolution, I.
WELLS, H.G., HUXLEY, J.S. AND WELLS, G.P.—The Science of Life, Doubleday, New York, 1931.
WHEELER, W.M.—Emergent Evolution, Norton, New York, 1928.
WHITEHEAD, A.N.—Adventures of Human Ideas, University Press, Cambridge, 1939.
———Science and the Modern World, Macmillan, New York, 1929.
———Process and Reality, Macmillan, New York, 1929.
WHITE, L.A.—On the Use of Tools by Primates, Journal of Comparative Psychology, xxxiv, 1942.
WHYTE, L.L.—Accent on Form, Harper, New York, 1954.
———The Next Development in Man, Holt, New York, 1948.
———The Unitary Principle in Physics and Biology, Holt, New York, 1949.

WHYTE, W.H.—The Organisation Man, Cape, 1957.
WIENER, N.—The Human Use of Human Beings, Houghton Miffin Co., Boston, 1950.
———Cybernetics, Wiley, New York, 1948.
WILBUR AND MUENSTERBERGER (Eds.)—Psychoanalysis and Culture: Essays in Honour of Geza Roheim, International Universities, Press, 1951.
WILLIAM, R.J.—The Human Frontier, Harcourt, Brace, New York, 1946.
WILLIAMS, T.R.—The Evolution of a Human Nature, Philosophy of Science, January, 1959.
WOLFGANG, KOHLER—The Mentality of Apes, Harcourt, Brace, New York, 1918.
WOODGER, J.H.—Biological Principles, Routledge, London, 1929.
YERKES, ROBERT M.—Chimpanzees, a Laboratory Colony, Yale University Press, New Haven, 1943.
———AND YERKES, ADA W.—Social Behaviour in Infra-human Primates, in A Handbook of Social Psychology, Clark University Press, Worcester, Mass, 1955.
———AND NISSEN, HENRY, W.—Pre-linguistic Sign Behavior in Chimpanzees, Science, 89, 1939.
YOUNG, J.Z.—Doubt and Certainty in Science, Clarendon Press, Oxford, 1951.
———The Life of Mammals, Clarendon, Oxford, 1957.
ZUCKERMAN, S.—The Social Life of Monkeys and Apes, Kegan Paul, London, 1932.

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