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Neither Mind Nor Brain

"Before all other things, man is distinguished by his pursuit and investigation of TRUTH. And hence, when free from needful business and cares, we delight to see, to hear, and to communicate, and consider knowledge of many admirable and abstruse things necessary to the good conduct and happiness of our lives: whence it is clear that whatsoever is true, simple, and direct, the same is most congenial to our nature as men. Closely allied with this earnest longing to see and know the truth, is a kind of dignified and princely sentiment which forbids a mind, naturally well constituted, to submit its faculties to any but those who announce it in precept or in doctrine, or to yield obedience to any orders but such as are at once just, lawful, and founded on utility. From this source spring greatness of mind and contempt of worldly advantages and troubles."

Marcus Cicero

"The more the universe seems comprehensible, the more it also seems pointless."

Steven Weinberg

"When even the brightest mind in our world has been trained up from childhood in a superstition of any kind, it will never be possible for that mind, in its maturity, to examine sincerely, dispassionately, and conscientiously any evidence or any circumstance which shall seem to cast a doubt upon the validity of that superstition. I doubt if I could do it myself."

Mark Twain

Neither Mind Nor Brain

An Interdisciplinary Inquiry

C.J. Roy

2020

This book is dedicated
to my parents,
Suor Donatella
and TKJ

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GENERAL INTRODUCTION

"We are not here concerned with
our hopes or fears, only with the truth
as far as our reason allows us to discover it. "
Charles Darwin

Nature is infinite. Though nowhere inaccessible, it is everywhere unfathomable. The phenomenon of nature is regarded as one continuous (or discontinuous) succession of causes and effects. Science explores that sequence from the nearest fact to the farthest limit. Deepest insight into great questions about the structure of reality and mind no more appears most readily to any so-called religious authorities. Given common sense under scrutiny, it prefers science to fantasies and superstitions. Mostly, enslaving dogmas are founded upon uncritical assumptions about conscious mind.

Pursuing a scientific explanation of mind and body, Francis Crick's «astonishing hypothesis» states, «all aspects of brain's behavior are due to the activity of neurons»[1]. His hypothetical inference presents an extreme reductionist view on the field of mind-body research in contrast to the dualist «ghost in the machine»[2] position. The mind and the brain still baffle any individual pursuit of explanation that has been achieved so far. Eccles, a Nobel laureate, would confess, «The more we discover about the brain, the more clearly do we distinguish between the brain events and the mental phenomena, and the more wonderful do both the brain events and the

[1] F. CRICK, 1994, 259.

[2] Gilbert Ryle's summing up of Cartesian dualism.

mental phenomena become»[3]. Though the mind-body problem bewilders all experimental and theoretical endeavors of numerous disciplines, the conscious experience or the cognitive behavior is essentially vital to human life. Therefore, it is sensible to explore this confounding mystery in the context of contemporary scientific and philosophical researches. In this book, the effort is to show that the mind is irreducible to the brain, though it cannot be dichotomized from its neuronal correlates as a separate entity. In addition, the mind-brain identity and duality are rejected proposing the hypothesis of emergent functionalism.

Where faith launches, science ends. Faith has its origin in the poetic imagination and is fixed to some untested speculations. Science on the other hand, originates in the striving rationality of man. Faith provides unconditional jargons, which are pseudological. Religion has run out of justifications on most of its claims. All interpretations made by a scientist are hypotheses. And, every hypothesis is tentative. It must forever be tested. It must be abandoned, if falsified. Nonetheless, irrational absolute statements by belief systems are not even falsifiable. Scientific hypothesis can be revised whenever found to be insufficient. Revision is not a sign of weakness but rather evidence for continuous excellence. However, there is no falsification before the arrival of a better theory. Theories are mental constructs potentiated by accumulated facts. They are structures of ideas that explain and interpret facts. In addition, a fact is a state of affair that is mediated by thought. It cannot be denied that men's fleeting states of mind is the steady foundation of science. The mind-body problem cannot but be multidisciplinary as it calls for critical scrutiny of creeds and reductive realism.

How conscious mind emerges within the universe of physical reality must deal with the question of physical reality itself. Every satisfactory inquiry into the mind-body problem has to be interdisciplinary that primarily involves neuroscience, psychology, cognitive science, physics, biology and philosophy. This study has consulted literature from all those fields, though not exhaustively, for better explanatory information. Neuroscience provides empirical evidence for the neuronal architecture of the phenomenon of mind. Psychology naturally supplies theoretical explanations based on

[3] J.C. ECCLES – D.N. ROBINSON, 1984, 36.

behavioral studies about evolved psychological functions of the mind. Cognitive science offers testable results concerning cognitive processes in relation to the information-processing model of mental function. It is inevitable to consult physics whenever the explanation has to be founded upon observable reality, and biology to develop an evolutionary profile of human mind. Philosophical discipline gives a conceptual analysis of the mind-brain problem. The philosophical exertion of this book consists in the theoretical approach to unify results of diverse disciplines. From the explanatory standpoint, the upshots of these fields are integrated to deal with the mind-body problem. Occasional references to molecular biology and physical-chemical debates on the subject matter will also be minimally sought advice when necessary. This study cannot be anything but critical of its methodology. As there are numerous theories in the ambiance of philosophy of mind, this reading takes a critical approach towards materialistic reductionism and dualism. The critical approach to the materialistic reduction and dualism will not be mere historically descriptive but be more of a thematic discussion.

A comprehensive explanation of the mind-brain calls for a synthesis of varied disciplines. Though the methodology is interdisciplinary, the author of this book has no authoritative direct experimental research background in neuroscience, physical science and cognitive science. However, the author has explored information from the giants of these disciplines from their written sources that deal with the theme of mind and body. This study is certainly not an exhaustive survey of the books published in those fields. From the domain of philosophy, the literature consulted will be on the philosophy of mind especially that which belongs to a background of neurophilosophy or philosophy of neuroscience. This work is not delimited to any particular philosopher or scientist. The research incorporates discoveries and conclusions from the authors of various scientific disciplines to substantiate its hypothesis.

Research indicates different levels of global mental states and local neuronal processes. Moreover, the brain as a complex biological system is organized from local to system-scale level. The mind in its systemic level is contingent on the brain as a whole. Any explanation is a progressive affair for the best possible guess. It consists in successive approximation. The proposed hypothesis in this book moderately explains the mind-brain. The proposal may explain

different mental phenomena more inclusively without falling into reductive materialism and dualism. It is a moderate guess. It is a working hypothesis in the sense that it may function as a virtual governor for future research, and requires further successive approximations.

First chapter elucidates three points. From observable-experimental view of neuroscience, the brain and mind are not two distinct dichotomized substances. A dualist account is insufficient to explain the mind-body relation. And, the necessary dependence of the mental on the physical does not essentially lead to an identity.

Second chapter defends that the brain and mind are not identical. The hypothesis of this book does not support either type-type identity or token-token identity. A mental event type cannot be reduced to any physical event type. So also, a mental token cannot be reduced to a brain token. Along with these themes, the first two chapters will also deal with much discussed topics like multiple realizability, hard problem, inverted spectrum, zombies, and *qualia*.

Third chapter discusses functionalist and computationalist approaches to mind-brain. Functionalism is likely to be in accord with non-reductive realism, though the functional identity of the mental is incomplete. Although brain-like computers may be devised, there is no precise distinction between hardware and software in the mind-brain. Moreover, the mind is not just an automatic mechanistic system that mediates input and output.

The nature of functionality is one of the fuzzy questions. Fourth chapter expounds that the mind-brain system has a biological functional profile. Intuitively, the mental system is explained as an emergent functionality of the complex neuronal-functional system of brain. Mind-brain relation is non-reductive and functional in nature. The philosophical framework developed in the first four chapters will function as a virtual governor for the development of the hypothesis in following sections.

Complex dynamic systems can give rise to emergent properties. Fifth chapter elaborates on the notion of emergence. Emergence is a fundamental empirical fact in the world. Different types of emergent phenomena can be observed in various levels of reality. The chapter explores crucial marks of emergence, emergence in relation to complexity and self-organization, and systemic and constraint approach to emergence.

The brain as a dynamic biological system has epigenetic, phylogenic, ontogenetic history. Sixth chapter situates the question of mind-brain within evolutionary history. Evolutionary forces have chosen the mind-brain to be an adaptive solution to deal with highly complex information.

Emergent systems in the observable universe are open systems that make use of energy resources. Thermodynamics may play crucial role in the origin and evolution of the universe. Seventh chapter explores how the complex dynamics is evolved from thermodynamics to teleodynamics. Hence, the issue covers thermodynamic systems, far-from equilibrium systems, thermo-dynamics of biological systems, and finally teleodynamics. Thermodynamics has crucial explanatory weight for the system of mind-brain.

Information is an essential category in understanding the fundamental micro and macro structures of reality. Eighth chapter concerns with how information is related to entropy, emergence, evolution and the brain. The brain primarily deals with information about organism and environment. Although, human cognitive system processes information, it is not a predetermined program like a computer. How the information integration gets conscious of itself is the issue to be elaborated.

The final chapter explicates the key hypothesis of this book incorporating various outcomes from previous chapters. Emergent functionalism holds that the mental state is an emergent state with some function. The mind is the multiple realizable emergent *teleofunctional state* of the dynamic system of brain. Self-reflexive consciousness is the emergent entity of the complex neuronal-functional organization of the brain. Global-order *autopoietic neuronal-functional teleodynamic* subserves a «what it feels like to be a conscious subject». The hypothesis of the book is that the self-reflexive conscious subject, which simulates itself and models a virtual world, is *the emergent functionality* that is *the teleos* of the entire brain.

CHAPTER I

MIND AND BODY ARE NOT TWO

"So what is this mind of ours:
what are these atoms with consciousness?
Last week's potatoes!
They now can remember what was going on in my mind a year ago – a mind, which has long ago been replaced.
To note that the thing I call my individuality is
only a pattern or dance,
that is what it means when one discovers
how long it takes
for the atoms of the brain to be replaced by other atoms.
The atoms come into my brain,
dance a dance, and then go out – there are always new atoms, but always doing the same dance,
remembering what the dance was yesterday. "

Richard P. Feynman

The sweetest melodies are not too magnificent to be expressed by notes. An entire nation may be the collectivity of free wills of citizens inside an operational boundary. Neurological correlates may not explain what beauty is, but for any experience of something beautiful, certain specific brain areas are likely to be involved. Every time a certain portion of the brain is razed, a function is obliged to cease. Arguably, consciousness has its origin and function in physical occurrences of the brain. It is inevitable to clarify problems