SMUTS CHAPTER VII *"Mechanism and Holism"*

ANALYSIS

1. STRUCTURAL POSITION AND CHAPTER FUNCTION

Chapter VII occupies a pivotal position in *Holism and Evolution*, serving as the crucial reconciliation between mechanism and holism that dissolves what Smuts considers the greatest pseudo-problem in philosophy: the apparent conflict between physical determinism and mental causation. Where Chapters V and VI established the ontological and functional foundations of Holism, Chapter VII demonstrates how this framework resolves the body-mind problem that has plagued Western thought since Descartes.

Argumentative Function

The chapter performs three interlocking operations. First, it reframes the mechanism-holism relationship from opposition to continuity, arguing that mechanism is not the antithesis of holism but rather its earliest, most primitive phase. Second, it demonstrates that the laws of thermodynamics, properly understood, do not preclude the selective and directive functions of life and mind. Third, it dismantles vitalism as thoroughly as it critiques mechanism, showing both positions to rest on the same fundamental error: the hypostatization of wholes into separate interacting substances.

Transition Logic

From Chapter VI's elaboration of holistic functions (regulation, creativeness, freedom), Chapter VII addresses the inevitable question: how can these non-mechanical functions operate within a physical universe governed by the laws of energy? The answer prepares for Chapter VIII's treatment of evolution by showing that holistic causation is not merely compatible with natural law but represents its deepest expression.

2. KEY CONCEPTS AND TERMINOLOGY

The Mechanistic-Holistic Continuum

Smuts reconceptualizes the mechanism-holism relationship as a graduated spectrum rather than a dichotomy. He writes: "There is a measure of Mechanism everywhere, and there is a measure of Holism everywhere; but the Holism gains on the Mechanism in the course of Evolution, it becomes more and more as Mechanism becomes less and less with the advance" (p. 148). This formulation dissolves the traditional opposition by treating mechanism as "an earlier, cruder form of Holism" (p. 148).

The key insight is that both concepts are matters of degree. Mechanism applies legitimately to physico-chemical structures where parts maintain their identity and interact mathematically. As wholes develop greater integration, mechanism gives way progressively to holism until, in mind and personality, "the mechanistic concept ceases to be of any practical use" (p. 148).

The Three-Level Structure Hierarchy

Smuts articulates a graded series of structural types:

- **Physico-chemical structures:** Predominantly mechanistic, governed by energy laws, parts maintain separate identity
- **Bio-chemical structures (organisms):** Mixed character where "Holism seems to balance mechanism," incorporating life's selective functions
- **Psycho-physical structures:** Holism dominant, mechanism subordinate, characterized by direction and purpose

Crucially, "the earlier structures are not destroyed but become the basis of later, more evolved synthetic holistic structures" (p. 148). This establishes what contemporary systems biologists would recognize as hierarchical organization with nested levels of constraint.

Selectiveness and Self-Direction

These emerge as the fundamental holistic attributes distinguishing living from non-living systems. Selectiveness "seems an inherent and fundamental property of matter" (p. 162) rooted in electromagnetic affinities, but reaches full expression in organisms: "A cell shows selective power or selectivity in all its processes, such as the assimilation of its food and the rejection of what is not suitable for its nourishment" (p. 162).

Self-direction represents "a particular form or species of the more general power of selectivity" (p. 162)—the capacity to orient movement toward ends. Together, these constitute "the tap-root of choice or will" (p. 162), providing the naturalistic foundation for agency without invoking supernatural causation.

The Fundamental Error of Hypostatization

Smuts identifies the core mistake generating the body-mind problem: "the severance of essential elements in a whole and their hypostasis into independent interacting entities or substances" (p. 149). Whether in Cartesian dualism (*res cogitans* and *res extensa*) or Driesch's vitalism (Entelechy), the error consists in treating aspects of unified wholes as separate things requiring external relations to reconnect them.

Maxwell's Demon and Statistical Laws

Drawing on Clerk-Maxwell's thought experiment, Smuts argues that the laws of thermodynamics are "statistical in character" (p. 166)—they apply to aggregates and averages, not to individual elements. This opens theoretical space for selective processes that operate below the statistical threshold: "Through this selective activity all collision with the second law is avoided, which is true of statistical averages only" (p. 167).

This argument anticipates contemporary discussions of biological organization operating within thermodynamic constraints while achieving local decreases in entropy through selective information processing.

3. CORE ARGUMENTS AND THEIR STRUCTURE

Argument I: Against Mechanistic Reductionism

The mechanistic position holds that the physical realm constitutes "a closed system dependent only on physical laws, which leave no opening anywhere for the active intervention of non-material processes like life and mind" (pp. 148–149). If true, "the activity and causality of life and mind are therefore at bottom essentially illusory" (p. 149).

Smuts offers two decisive objections. First, the epistemic argument: "if we have to be guided by our clear and unequivocal experience and consciousness, nothing can be more certain than that our human volition issues in active movements and external actions" (p. 149). Denying the efficacy of consciousness undermines the very faculties by which we construct mechanistic science.

Second, the evolutionary argument: "if life and mind were merely ineffective illusions, how could they have arisen and grown as biological factors in the struggle of existence?" (p. 149). Natural selection cannot favor epiphenomena; the manifest evolutionary success of minded organisms demonstrates that mind makes a causal difference.

Argument II: Against Vitalism

Vitalism, exemplified by Driesch's Entelechy, posits "a non-mechanical agent at work in psycho-physical systems which has the power of suspending their action" (p. 172). While correctly recognizing that physico-chemical categories are insufficient, vitalism errs by constituting life as "a real agent, a real operative factor inside the physico-chemical system" (p. 172)—essentially replicating dualism's mistake.

Smuts observes that Entelechy "is in fact nothing but Maxwell's hypothetical demon" (p. 172)—a mysterious external selector. But no such *deus ex machina* is necessary: "the fundamental concept of Holism suffices to explain the creative, directive, controlling activity of organic and psychic wholes" (p. 149). Selection and direction arise from the inherent structure of wholes, not from added agents.

Argument III: The Holistic Resolution

The key move is reconceiving life and matter as different phases of the same underlying process rather than different kinds of substance. "I envisage the physico-chemical structures of Nature as the beginnings and earlier phases of Holism, and 'life' as a more developed phase of the same inner activity" (p. 175).

Life, on this view, is "not a new agent, with the mission of interfering with the structures of matter" (p. 175) but rather "a new, more complex organisation or a new structure of the physico-chemical structures of Nature" (p. 175). The control life exhibits "is nothing but an extension and development of the natural physical control which... is already in operation in the lower structures for the maintenance of the inner stability" (p. 175).

This dissolves the body-mind problem by eliminating its presupposition. There are not two kinds of thing requiring mysterious interaction but one developing process in which "the lower becomes the unit for the next higher; there is a grading of the advance without a destruction of the steps or grades constituting the advance" (p. 170).

Argument IV: Compatibility with Thermodynamics

The crucial technical argument addresses how holistic selection operates within physical law. Smuts argues: "The laws of energy hold for the physical mechanisms of organisms and persons no less than for purely physical systems; and the influences of life and mind, whatever they may be in other directions, do not invalidate the application of these laws" (p. 169).

The reconciliation works through the statistical character of thermodynamic laws. Selection operates on individual elements below the aggregate level where statistical laws apply: "Change of direction need not, therefore, involve any change in the energy situation, as Leibniz held and as is commonly assumed" (p. 168). Life's organizing activity works *within* thermodynamic constraints, not against them.

4. RELATION TO SMUTS'S HOLISTIC FRAMEWORK

Connection to Tier 1 Concepts

Holism as Fundamental Principle: Chapter VII extends holism's explanatory scope to cover the mechanism-mind continuum. Holism emerges not merely as an organizing principle but as the underlying process of which mechanism is an early phase and mind a late phase. The chapter demonstrates holism's capacity to dissolve traditional dualisms by revealing their shared presuppositional error.

The Whole as Ontologically Primary: The critique of hypostatization reinforces whole-primacy. The body-mind problem arises only when we abstract aspects of wholes and treat them as independent substances. "It is not the reality of life and mind that is denied, but their construction as independent entities of a character and kind to interact with other entities" (p. 157). Wholes are primary; parts and aspects are derivative.

Field Effects of Wholes: The chapter's treatment of equilibrium and its maintenance through distributed adjustment anticipates field-theoretic thinking. When equilibrium changes, "there is a redistribution which affects all the elements; the structure is plastic as a whole" (p. 173). This holistic responsiveness—where local perturbation produces global adjustment—characterizes fields rather than mechanisms.

Creative Evolution/Synthesis: The chapter frames evolution as fundamentally creative: "The process is not mechanical or additive but essentially evolutionary or creative; at each stage something new arises from the mixture, interaction and fusion of the component elements" (p. 153). The two great *saltus*—life and mind—represent not additions to mechanism but its creative transformation.

Mind as Holism's Apex: Mind represents holism's highest known expression, where "mechanism seems to give pride of place to Holism" (p. 151). But mind does not break with lower phases; it incorporates them: "Thus mind structures presuppose life structures, and life structures presuppose energy structures" (p. 170). The hierarchy is one of inclusive emergence, not replacement.

The Holistic Formula Revisited

Chapter VII explains why the holistic formula ($a_1 + b_1 + c_1 = X_1$) holds across levels. Mechanism would predict a + b + c = (a + b + c)—mere aggregation preserving part-identities. But in holistic synthesis, parts are transformed (subscript notation) because the whole's equilibrium distributes changes across all elements. This is not mysterious vitalist intervention but the inherent character of structured wholes maintaining dynamic stability.

5. CONTEMPORARY SCIENTIFIC RESONANCES

Non-Equilibrium Thermodynamics and Dissipative Structures

Smuts's argument that life operates within thermodynamic constraints while achieving local organization anticipates Ilya Prigogine's dissipative structures (Nobel Prize, 1977). Living systems maintain themselves far from equilibrium by continuous energy throughput, achieving decreased local entropy at the cost of increased global entropy. Smuts's insight that "in living bodies complex substances are for ever being built up with a high energy efficiency" (p. 165) captures this essential feature.

Contemporary biophysics confirms that biological organization doesn't violate the second law but exploits its statistical character. The selectiveness Smuts attributes to life operates through information-processing that directs energy flows, exactly as his Maxwell's Demon argument suggests—though contemporary theory provides the biochemical mechanisms Smuts could only gesture toward.

Biological Relativity and Downward Causation

Denis Noble's biological relativity framework directly echoes Smuts's arguments. Noble argues that causation in biology operates across levels, with higher-level organization constraining lower-level processes without violating physical laws. Smuts anticipates this precisely: "An organism is more than a physical structure; but in so far as it is a physical structure it obeys the laws of energy just as if it were nothing but a physical structure" (p. 169).

Noble's critique of gene-centrism—showing that genetic information is always contextually interpreted by higher-level cellular organization—parallels Smuts's rejection of mechanism. In both cases, the lower level provides necessary conditions but not sufficient explanation; the organizing whole must be invoked.

Embodied Cognition and Enactivism

Smuts's treatment of mind as continuous with life rather than categorically distinct anticipates contemporary embodied cognition and enactivism. His claim that selectiveness is "the tap-root of choice or will" (p. 162), developing from primitive organisms to conscious purposiveness, parallels Evan Thompson's *Mind in Life* thesis of deep continuity between life and mind.

The enactivist rejection of the "hard problem" of consciousness—arguing that it arises from dualist presuppositions—directly echoes Smuts: "The problems, difficulties and contradictions which arise in connection with these bio-chemical and psycho-physical wholes are due to fundamental misconceptions" (p. 154). Both traditions dissolve rather than solve the body-mind problem.

Autopoiesis and Organizational Closure

Maturana and Varela's autopoiesis theory describes living systems as organizationally closed—self-producing unities maintaining their organization through continuous material and energetic exchange. Smuts's description of life-structures as "a structure in a similar state of unstable equilibrium" (p. 176) that maintains itself through "the very nature and process of the equilibrium" (p. 177) captures the essential autopoietic insight without the later terminology.

Emergence and Strong versus Weak Emergence

Contemporary philosophy of science distinguishes weak emergence (predictable in principle from lower-level properties) from strong emergence (genuinely novel causal powers). Smuts's position is nuanced: the "new" in creative evolution is genuinely novel ("sui generis and wholly different in kind and nature") yet arises from rather than being added to physical processes. This anticipated the current debate's recognition that emergence need not be supernatural to be real.

Information Theory and Biological Semantics

Smuts's focus on selection and direction as life's fundamental properties resonates with biosemiotic approaches treating organisms as information-processing systems. The Maxwellian insight that selection operates below statistical aggregates finds contemporary expression in discussions of biological information: meaningful signals that organize metabolic processes by selecting among possibilities without adding energy.

6. CRITICAL EVALUATION

Philosophical Strengths

Dissolution over Solution: Smuts's strategy of dissolving the body-mind problem by exposing its presuppositions represents sophisticated philosophical practice. Rather than offering another theory of mind-body interaction, he demonstrates that the question is malformed. This therapeutic approach anticipates later Wittgensteinian and pragmatist critiques of pseudo-problems.

Symmetric Critique: The equal rejection of mechanism and vitalism demonstrates philosophical even-handedness. Smuts recognizes that these apparent opposites share the same fundamental error—hypostatization—making his alternative genuinely novel rather than a synthesis of existing positions.

Naturalistic but Non-Reductive: The framework remains thoroughly naturalistic (no supernatural causation, no violation of physical laws) while resisting reductionism. This represents a genuine philosophical achievement: showing that respecting science's findings doesn't require denying the reality of mind, purpose, or meaning.

Scientific Prescience

Statistical Mechanics: Smuts's use of Maxwell's Demon to argue for selection within thermodynamic constraints shows remarkable scientific sophistication for 1926. He correctly grasped that biological organization exploits statistical regularities rather than violating deterministic laws.

Hierarchical Organization: The three-level hierarchy (physico-chemical, bio-chemical, psycho-physical) with conservation of lower levels in higher anticipates the hierarchical models that became standard in systems biology and cognitive science.

Potential Limitations

Mechanism of Selection: While Smuts argues that selection and direction are inherent in holistic structures, he doesn't specify how they operate physically. The Maxwell's Demon analogy is instructive but not explanatory. Contemporary biophysics has begun filling this gap (enzyme catalysis, allosteric regulation, signal transduction), but Smuts could only indicate the theoretical space.

Quantum Mechanics Absent: Writing just after quantum mechanics' development but before its consolidation, Smuts doesn't engage with quantum indeterminacy. Contemporary discussions of biological quantum effects might strengthen his case for selection operating below classical determinism, but this resource was unavailable in 1926.

Consciousness Gap: While dissolving the body-mind problem as traditionally framed, Smuts doesn't fully address phenomenal consciousness—the qualitative feel of experience. His account explains functional integration but may leave the "hard problem" residue for those who find it compelling.

Historical Context

The chapter's engagement with Driesch's neo-vitalism places it in direct dialogue with the major biological debate of the early twentieth century. Smuts's critique proved prescient: vitalism faded

from scientific discourse while the mechanistic alternative he also rejected proved increasingly inadequate. The holistic alternative he proposed has been independently rediscovered by contemporary systems biology.

7. KEY QUOTATIONS FOR HOLISM RISING

On Mechanism and Holism as Continuous

"There is a measure of Mechanism everywhere, and there is a measure of Holism everywhere; but the Holism gains on the Mechanism in the course of Evolution, it becomes more and more as Mechanism becomes less and less with the advance. Holism is the more fundamental feature, and we may therefore say that Mechanism is an earlier, cruder form of Holism." (p. 148)

On the Fundamental Error

"The fundamental mistake is the severance of essential elements in a whole and their hypostasis into independent interacting entities or substances. Thus body and mind wrongly come to be considered as two separate interacting substances." (p. 149)

On Holism's Explanatory Sufficiency

"No such deus ex machina is necessary; the fundamental concept of Holism suffices to explain the creative, directive, controlling activity of organic and psychic wholes; and the attributes of life and mind are inherent in the advanced concept of wholes." (p. 149)

On Selectiveness as Fundamental

"Selectiveness is likewise the fundamental property of all organism; it is indeed the most primitive property of life. Perhaps it is the very point where the organic and inorganic were still one and began to diverge." (p. 162)

On Statistical Laws and Selection

"Through this selective activity all collision with the second law is avoided, which is true of statistical averages only. Life or organic structure can build and does build itself up and increase its energy reserves and potentials in spite of the second law." (p. 167)

On Life as Higher Structure

"I envisage the physico-chemical structures of Nature as the beginnings and earlier phases of Holism, and 'life' as a more developed phase of the same inner activity. Life is not a new agent, with the mission of interfering with the structures of matter; it involves no disturbance of the prior structures on which it is based." (p. 175)

On Creative Continuity

"The new is a creative continuation of the old and not a denial of or going back on it. Holism as an active creative process means the movement of the evolutionary world towards ever more and deeper wholeness." (pp. 149–150)

On the Compatibility of Laws

"The laws of life and mind are not in conflict with the laws of energy. An organism is more than a physical structure; but in so far as it is a physical structure it obeys the laws of energy just as if it were nothing but a physical structure." (p. 169)

On the Cosmic Trend

"The inner trend of the world, registered in its very constitution, is directed away from the merely mechanical towards the holistic character and towards the realisation of Holism as its immanent ideal." (p. 178)

On Underlying Unity

"There remains one great fundamental Process creatively flowing forward and giving to all the manifold and diversified forms of the world the unity which is theirs by inalienable birthright. It is Holism, and its pathway is the forward movement in the world, where all differences and gaps and apparent antagonisms are but the steps in the progress, the moments in the great line of advance." (p. 180)

CONCLUSION: SIGNIFICANCE FOR HOLISM RISING

Chapter VII provides essential material for demonstrating Smuts's anticipation of contemporary developments in systems biology, philosophy of mind, and theoretical biology. The chapter's arguments against both mechanism and vitalism, its sophisticated use of thermodynamic concepts, and its vision of life as organized complexity within physical law all find remarkable echoes in current scientific literature.

Three convergences are particularly striking for the Holism Rising project:

First, Smuts's dissolution of the body-mind problem through reconceiving mechanism and holism as phases of one process directly anticipates the enactivist and embodied cognition movements. Contemporary theorists independently arriving at similar conclusions validates Smuts's philosophical approach.

Second, the argument that biological organization works within thermodynamic constraints through selective information processing anticipates the synthesis of thermodynamics and information theory in contemporary biophysics. Smuts grasped the essential insight without the mathematical apparatus later developed.

Third, the hierarchical model of organization with conservation of lower levels in higher—physico-chemical structures as units of bio-chemical structures, bio-chemical as units of psycho-physical—maps directly onto contemporary systems biology's multi-scale models.

The chapter's treatment of selection and self-direction as emergent from but continuous with physical processes provides crucial support for Smuts's non-reductive naturalism. Life and mind are neither illusions (as mechanism claims) nor supernatural additions (as vitalism implies) but genuine organizational achievements of matter under holistic constraints. This vision, prophetically articulated in 1926, is being independently validated across multiple scientific disciplines.

For the Holism Rising bracketing technique, Chapter VII offers ideal material: contemporary systems biologists, philosophers of biology, and cognitive scientists reaching Smuts's conclusions through independent empirical and theoretical work, largely ignorant that Smuts articulated the essential insights a century earlier. The chapter demonstrates that the mechanism-versus-vitalism debate was a pseudo-problem, dissolved rather than solved—and that contemporary science is, once again, converging on the holistic alternative Smuts proposed.