

The Pennsylvania State University

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Department of Kinesiology

**EMBODYING KINESIS:  
HOW ARISTOTLE AND POLANYI RESHAPE  
THE PHILOSOPHY OF KINESIOLOGY**

A Dissertation in

Kinesiology

by

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## Abstract

What *is* Kinesiology? While the stock answer, “the study of human movement,” may initially satisfy some, it leaves the content and mission of the field quite vague, perhaps even empty. What type of “movement,” after all, are we talking about; sewing, crossing the street, playing basketball, eating spaghetti? All such movement forms would seem to fit the popular definition of kinesiology, yet intuitively most people would admit that basketball seems much more appropriate than any of the other options. Why? Is such an intuition justified? Or is this obsession with “sport” merely an artifact of the dumb-jock dark ages? Is physical education a coincidental or necessary part of Kinesiology? If kinesiologists cannot give an adequate response to such questions how can the discipline possibly even begin to understand itself?

This ambiguity regarding the mission of Kinesiology leads to and informs another problem. What is the proper relationship between the sciences and humanities in Kinesiology? Why are philosophers, historians, physiologists and biomechanists all under the same roof? How should their common discipline of Kinesiology inform their work and define their relationship? There is little doubt that in most contemporary Kinesiology departments the power structure is tilted, (for both pragmatic and philosophical reasons) in favor of the sciences. Whether this is a problem that needs to be remedied or is the proper constitution of a Kinesiology department cannot be fully answered until one has nailed down in more concrete terms what Kinesiology actually is. Until such an understanding has been achieved, articulating the proper relationship between the sciences and the humanities in the field of Kinesiology is a foolhardy quest.

Perhaps part of the problem is with the understanding of “motion” itself? An Aristotelian understanding of what the word *kinesis* actually means reveals a more dynamic and more human understanding of motion. According to Aristotle, *kinesis* is central to human identity. Motion involves more than merely change of place. In the case of animals (which includes human beings), motion cannot be understood apart from choice and perception. Human locomotion is impossible without the conscious perceptions of the mover. *Kinesis* is not a mere brute fact of nature, but rather a central aspect of human *being*. If this is correct then the field of Kinesiology needs to embrace culture as much as it embraces mathematics and measurement.

In addition, scientist/philosopher Michael Polanyi argues through his theory of “personal knowledge” that the gulf between the sciences and humanities is in a very real sense imagined. Knowledge is real but requires a conscious and skilled engagement with the world. As such, science is not a self-sufficient or all-encompassing mode of inquiry but is dependent on human

culture, language and tradition. Consequently the sciences and humanities should be seen as partners rather than antagonists. Building on the work of both Aristotle and Polanyi I argue that a fresh understanding of both motion and epistemology must be constituted if Kinesiology is to become a coherent and unified academic field.

## **“Embodying Kinesis” - Contents**

Acknowledgments .....	vi
Chapter 1 – What is Kinesiology? .....	1
Literature Review.....	17
“The Two Cultures” .....	17
Conant, Henry, and the Birth of Kinesiology .....	21
Voices from Outside Kinesiology .....	29
Voices within the Kinesiology Literature .....	38
Chapter 2- Aristotle & <i>Kinesis</i> .....	49
Chapter 3- <i>Kinesis</i> and the Nature of the Human Person .....	79
Chapter 4- Objectivity and Tacit Knowledge.....	104
Chapter 5- The Impact of Aristotle and Polanyi on the Field.....	130
Impact Area #1: Holism .....	131
Impact Area #2: Experience, Practice, Apprenticeship .....	145
Impact Area #3: Specificity .....	155
Impact Area #4: Activity .....	167
Bibliography .....	172

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## Chapter 1 – What is Kinesiology?

*“Not everything that can be counted counts, and not everything that counts can be counted.”<sup>1</sup>*

During the course of my doctoral work at Penn State University, I gradually became more and more interested in questions regarding the nature of kinesiology. Eventually, because it is so central to understanding kinesiology, investigating the proper relationship of the sciences and the humanities became prominent as well. Why did C.P. Snow’s “two cultures” exist in kinesiology? Initially such interest manifested itself rather superficially in a continuing debate in the graduate student office on the question of whether the description of kinesiology as “the study of human movement” meant anything. I was in the “*MacBeth* camp”, arguing that Kinesiology defined as the study of human movement was overly abstract and that in the end it was “a tale ... full of sound and fury; signifying nothing.” While the Shakespearean metaphor is in all likelihood a little melodramatic, it does paint a good picture of the problem. What exactly does “movement” signify? Certainly questions about the abstract nature of contemporary definitions of kinesiology are worth considering, if for no other reason than that kinesiologists will have thought hard about why and how they choose to define themselves the way they do.

As my studies progressed my suspicions regarding the value of the conventional and dominant descriptions of kinesiology were deepened on two

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<sup>1</sup> Albert Einstein, (*attributed*)

philosophic fronts. The first front was metaphysical.<sup>2</sup> While studying Aristotle's definition of motion in the *Physics* (1995), it struck me how a geometric and spatial understanding of "motion" was taken for granted in current definitions of kinesiology and how different such a conception was to Aristotle's own understanding. Aristotle saw *kinesis* as an ontological rather than merely geometrical reality. *Kinesis* was central to human identity and to the identity of the cosmos as a whole. Motion involved more than merely change of place, and in the case of animals, could not be understood apart from choice and perception.

Perhaps, I thought, the definition of *kinesis* -- from which we derive the word kinesiology -- has been taken for granted. Perhaps, Aristotle's organic conception of *kinesis* could shed light on contemporary issues in kinesiology. It might even be the case that Aristotle's definition is actually a richer and more accurate description of the phenomenon of motion which is so central to kinesiology. In fact Aristotle was convinced that without a proper understanding of motion, no knowledge of nature was possible, "since nature is a source of motion and of change" (200b12).

The conventional understanding of *kinesis* or motion in kinesiology is essentially a materialistic one. This notion of *kinesis* is geometric, Newtonian, and inert; a product of the atoms and void that the philosophy of materialism

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<sup>2</sup> The metaphysical insights Aristotle had regarding *kinesis* will of course have huge implications for what we *know* about 'motion'. Likewise Aristotle's account of motion includes the very process of knowledge acquisition. In both of these senses then, the insight is epistemological as well.



endorses as the sum total of reality. Growing out of ontological materialism, is the related position of scientific materialism, which argues that since reality consists of only atoms and void, the investigative methods of the physical sciences are the sole source of human knowledge. All other forms of knowledge can be reduced to underlying physical causes. This idea, that science is a self-sufficient and all-encompassing guide to the nature of reality, is also sometimes described as scientism. It is of course true, however, that not all scientists or scientific methodologies embrace this doctrine. Dynamical systems theory or chaos theory as well as quantum mechanics, have all arguably challenged hard mechanistic models.<sup>3</sup> Yet materialistic commitments are still common both within kinesiology as well as the larger scientific community.

Too often in the field of kinesiology, quantification is championed to the detriment of other types of knowledge and richer understandings of motion. One of the key goals of this project is to challenge such commitments. If contemporary scientific research models actually make challenging the presuppositions of scientific materialism easier, so much the better.

Acclaimed physicist Richard Feynman provides one powerful example of materialistic thinking, although many other mainstream scientists such as Carl

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<sup>3</sup> In so far as I understand quantum mechanics and chaos theory, they do not *necessarily* change materialistic commitments among scientists. A more “chaotic” universe does not necessarily require the immaterial. The universe is merely a more complicated and unpredictable “machine”. Quantum mechanics on the other hand, if it is interpreted as a theory that emphasizes the necessity of the conscious observer, can combat the mechanistic worldview of materialistic scientists.

Sagan, Stephen Jay Gould, Richard Dawkins, Francis Crick, and E.O. Wilson, could be quoted as well (Wallace, 2007). Feynman asserts that:

“Everything is made of atoms. That is the key hypothesis. The most important hypothesis in all of biology, for example, is that everything animals do, atoms do. *In other words, there is nothing that living things do that cannot be understood from the point of view that they are made of atoms acting according to the laws of physics*” (1991, p. 17).<sup>4</sup>

Scientist and philosopher Michael Polanyi offers a similar anecdote from his own professional experience. “When I urged a meeting of the American Association of the Advancement of Science...to recognize the absurdity of regarding human beings as insentient automata, the distinguished neurologist R.W. Gerard answered me passionately; ‘One thing we know, ideas don’t move muscles.’ I couldn’t believe my ears” (1969, p. 46).

Such attitudes are not unknown in the world of kinesiology. The recent article “Motor Control: The Heart of Kinesiology” by Mark Latash, a leading kinesiologist in the area of motor control makes this abundantly clear. Latash opines that, “The main challenge of motor control (and kinesiology in general) seems to be turning it into an exact science, just like physics” (2008, p. 27). Latash believes that motor control is the heart of the field because “it combines approaches across most (if not all) of the more-traditional components of kinesiology.” (p. 23) What are these more traditional components of kinesiology? According to Latash they are “anatomy, muscle physiology, and physics,” as

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<sup>4</sup> It is true that understanding atoms *helps* us understand living things, but a closer reading reveals that that type of limited claim is not what Feynman has in mind. Why else would he say that “*everything* animals do atoms do.” [Emphasis Added] It seems clear that Feynman thinks that living beings can be *completely* understood by understanding atoms.

well as “neurophysiology, psychology, and mathematics” (p. 21). The humanities are nowhere to be found in his program.<sup>5</sup> The implication of this omission is clear. Only scientific knowledge is real knowledge.

Under a materialistic paradigm, the study of motion is broadly considered as a purely scientific field because such scientific inquiry is ultimately reducible to a function of physics. Only the measurable and tangible can be trusted. This type of thinking regarding motion is so ingrained in our culture that it is simply taken for granted (Sachs, 1995). One result of such a conception is an emphasis on the idea that kinesiology is academic only insofar as it has become or is becoming a hard theoretical science. Hard sciences - fields such as physics or chemistry - emphasize and rely on empirical inquiry, and quantification. Because of this, these “hard” sciences are supposedly untainted by the pitfalls of subjectivity found in the soft sciences and the humanities.

As will be seen in the forthcoming discussion of James Bryant Conant and the history of physical education, the pressure to transform the field into a hard science is not new.

The assertion that materialism is alive and well in kinesiology is no straw man.<sup>6</sup> Rather it goes to the very heart of kinesiologists’ own self-understanding and directly affects conceptions both theoretical (the nature of our field) and

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<sup>5</sup> Although, it is true that as a social science, psychology can exhibit some humanistic qualities, it would seem from the tone of his article however that Latash has only empirical psychology in mind.

<sup>6</sup> Nor is an attempt to play “gotcha.” Materialistic commitments among scientists are not hidden nor are they particularly uncommon.

practical (how our curriculum should be defined). Investigating whether or not motion can be understood as merely a science is not a trivial matter. Although materialistic commitments, habits, and attitudes are far from universal in the sciences, they are pervasive. It is time that such commitments, habits, and attitudes, in kinesiology were examined. Perhaps upon examination, they will be found wanting.

Arising out of these initial metaphysical concerns was the second front of philosophical investigation. This front was epistemological. If scientific materialism is mistaken, then the claim that science is the only valid source of knowledge is mistaken as well. But what then constitutes knowledge? What do we know and how do we know it? These epistemological questions were nurtured further by studying the work of distinguished scientist and philosopher Michael Polanyi.<sup>7</sup>

Polanyi was interested in examining how knowledge is acquired, as well as what can and should count as knowledge. In particular, Polanyi was worried about modern conceptions of objectivity. He believed that a strictly materialistic understanding of objectivity - despite the important discoveries and real progress science itself has allowed- was “strictly speaking nonsensical” (1969, p. 41). Strict scientism, resulting from these types of success, was mistaken.

A scientized conception of objectivity quarantined non-empirical knowledge by

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<sup>7</sup> Polanyi’s scientific work was highly esteemed. Regarding a particular piece of Polanyi’s early scientific work, Einstein commented, “The papers of your Mr. Polanyi please me a lot. I have checked over the essentials in them and found them to be fundamentally correct” (Scott & Moleski, 2005, p. 27)

labeling non-empirical knowledge claims as untrustworthy or worse yet by arguing that non-empirical knowledge was an illusion.

As a consequence, materialists argue that a value distinction should be drawn between objectivity and subjectivity. According to materialists, measurements and data (found in the sciences) should be seen as objective, while the intangibles of the humanities (values, virtues, meanings etc.) should be seen as merely subjective. This type of thinking is strikingly exemplified by biologist E.O. Wilson who argues in *Consilience* (1999) that all human knowledge is in the process of being integrated into the ultimate explanatory power of reductionistic science. Philosophy, Wilson argues, is valuable only as a salve for ignorance. With the advance of science, ignorance, and therefore philosophy, will soon be obsolete.

“There has never been a better time for collaboration between scientists and philosophers, especially where they meet in the borderlands between biology, the social sciences, and the humanities. We are approaching a new age of synthesis, when the testing of consilience is the greatest of all intellectual challenges. Philosophy, the contemplation of the unknown, is a shrinking dominion. We have the common goal of turning as much philosophy as possible into science” (p. 12).

On this view, any allegiance to the reality of consciousness, values, and tradition get in the way of real knowledge because they cloud analysis, and are incapable of being “objectively” measured. Therefore, a commitment to these fictional intangibles ultimately impedes progress. Yet as Polanyi points out, “no human mind can function without accepting authority, custom and tradition: it must rely on them for the mere use of language” (1969, p. 41). Clearly Polanyi

not only wants to make room for intangibles, he also feels that one cannot help but *rely on them*, even in scientific inquiry.

Polanyi argues that all knowledge requires a knower. To explain this rather simple assertion he advanced a triadic theory of knowledge. This triadic theory was a description of “from-to” knowledge. The triad consisted of the self, subsidiaries, and focal point(s). The self (a person), reached out to engage and understand part of the world (the focal point) through the subsidiaries they had acquired (habits, skills, experience, culture, etc). Truth was a matter of skilled acquisition, which was impossible outside of acculturated experience and apprenticeship. Polanyi names this new epistemology, which openly embraced the inarticulate and the intangible, “tacit knowledge.” According to Polanyi, habits, skills, experience, and culture, are not only vital to achieving a more comprehensive scientific picture of the world, no picture, empirical or otherwise, is possible without them. Despite Wilson’s impassioned pleas to the contrary, the humanities are in no danger of becoming obsolete.

The upshot of all this is the following: kinesiologists’ fundamental commitments regarding motion, whether metaphysical or epistemological, have remained largely unexamined. Yet, debates in the field often rest squarely on such fundamental commitments. Consequently, examining such commitments should bring clarity, if not agreement, on which positions make the most sense for the field. That is, this examination should shed light on the relative ability of differing commitments to accurately describe the phenomenon of human motion

as well as the nature of knowledge acquisition. Too often philosophic commitments in kinesiology fall along sub-disciplinary lines, creating an environment of isolation, misunderstanding, and mutual suspicion between scientists and humanists.

Polanyi argues that it is the epistemological dichotomization of the tangible and intangible, objective and subjective that set the stage for the “two cultures” debate made so famous by C.P. Snow (1959). Different conceptions of knowledge had led to different conceptions of the academy, and all too often, antagonistic relationships between researchers in different fields. Yet the debate between the “two cultures” is fundamentally a *philosophic* debate over the question, “what counts as knowledge?”<sup>8</sup> Once this point is understood, it becomes clear that no inherent reason exists for antipathy between scientists and humanists. There can be and in fact are scientists and humanists in both camps, even if the majority align themselves along occupational lines.<sup>9</sup> Certainly Karl Marx and his followers can be classified as ardent materialists.<sup>10</sup> On the contrary,

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<sup>8</sup> That is not to say that there are not right and wrong or better and worse philosophic commitments.

<sup>9</sup> A 1998 survey by the scientific journal *Nature* found that among “leading” scientists (as defined by National Academy of Sciences membership) a “near universal rejection of the transcendent by NAS natural scientists. Disbelief in God and immortality among NAS biological scientists was 65.2% and 69.0%, respectively, and among NAS physical scientists it was 79.0% and 76.3%.” Belief on the other hand across all sub-groups was 7% for God and 7.9% for immortality. Atheism does not necessarily entail materialistic commitments but given comments such as Oxford University scientist Peter Atkins, the two do seem to be more than tangentially related. “You clearly can be a scientist and have religious beliefs. But I don’t think you can be a real scientist in the deepest sense of the word because they are such alien categories of knowledge” (Larson & Larry, 1998, p. 313).

<sup>10</sup> In addition to Marxism, the philosophic implications of scientific materialism are wide-ranging. As B. Alan Wallace points out, “One can also see in the above depiction of the universe [scientific materialism] close parallels to the twentieth-century existentialism of Sartre or Camus, and reflections of the ethical

as Polanyi's anecdote points out, while he was certainly in the minority, he himself was not a scientific materialist.

Likewise the recent work of scientists Scott Kelso and David Engstrom in "The Complementary Nature" (2006) is suspicious of hard dichotomies and therefore open to the reality and influence of the immaterial. The "two cultures" are then, in the end, two schools of thought not necessarily aligned with different disciplines. As a matter of convenience and clarity, I will call these two schools scientific materialism (or simply materialism) and humanism.<sup>11</sup> In other words, the solution to reconciling the two cultures is not a matter of changing "occupation type" but rather one of altering or broadening one's philosophic commitments.

In demonstrating a new epistemology, Polanyi was trying to make room for a robust humanism by arguing that, while scientific knowledge was a vital and real source of knowledge, it was not the only source of knowledge. Scientism - the belief that scientific data was the only source of knowledge - was mistaken. Furthermore Polanyi was convinced that all knowledge, whether scientific or humanistic was built on the same epistemic foundation, and always involved

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relativism of postmodernists such as Derrida and Foucault" (2007, p. 29). It is also worth noting that materialism itself is an ancient (pre-Socratic) philosophy.

<sup>11</sup> Metaphysically these differences manifest themselves in a commitment to a purely material understanding of the human person vs. either dualistic or holistic understandings. Epistemologically the battle is over the value and primacy of measurement as well as the significance and existence of intangibles. I will use the terms materialism and scientific materialism interchangeably.



judgment, connoisseurship (as well as apprenticeship), imagination, and a fiduciary commitment.<sup>12</sup>

Although Polanyi's work has received little attention in kinesiological circles, fundamental questions regarding the nature and purpose of the field are alive and well. Recent scholarly work on the subject has been written by a broad range of leaders in kinesiology. (Kretchmar, 2005); (Zelaznik & Harper, 2007); (Rikli, 2006); (Newell, 2007); (Wade, 2007). The fact that these questions continue to be discussed and analyzed implies that the nature of the discipline remains unsettled. This unsettled nature was, in fact, the focus of the February 2007 issue of *Quest* (59 (1)), which dedicated its entire contents to the question of "defining the academic core of our discipline" (Reeve, 2007, p. 1). Although Newell (2007) argues that "physical activity" is the glue that binds the multiple agendas of kinesiology together, it remains unclear whether such glue is really strong enough to do the job; especially in an environment of specialization and mutual mistrust (Rikli, 2006). It is an open question whether "physical activity" is really something that can serve as a rallying point.<sup>13</sup>

Likewise it is not clear that "physical activity" is capable of bringing the "two cultures" together.<sup>14</sup> What does appear to be clear is that defining the core

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<sup>12</sup> It is, of course, more common to associate these types of characteristics with the arts than the sciences.

<sup>13</sup> What is clear, as Newell himself points out is that the "practice and performance of physical activity is increasingly being de-emphasized if not eliminated from physical activity programs in higher education." (2007, p. 10) The irony of this statement should be self-explanatory.

in abstract terms – such as physical activity – is attractive because it is seen as appropriately academic and scientific.<sup>15</sup> It may be however, that a reformation of kinesiologists' own understanding of *kinesis* and of “what counts as knowledge,” would significantly weaken the “self-evident” need for this level of abstraction.

Abstraction in and of itself is not bad. Conceptually, abstraction is a fundamental fact of life. Even the “play”, “games”, and “sport”, descriptions I find much more palatable, are abstractions. The question therefore is what level of abstraction is appropriate, and on what grounds those abstractions are justified. My concern is not over abstraction as such, but rather over the philosophic motivation for moving towards overly abstract descriptions of the field; descriptions that effectively empty it of any unifying content.<sup>16</sup>

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<sup>14</sup> I have to confess that I think that a positive answer to this question is doubtful. In what almost sounds like doublespeak Rikli (2006) says that “*sport* psychology and *sport* sociology are very important parts of the kinesiology curriculum, but courses on these narrower topics might be best conceived as electives, for those with an interest in sports studies, rather than as a part of the core curriculum” [Emphasis Added] One can't help but wonder how an elective can be labeled “very important”? Notice too that she mentions social sciences, but no strictly humanistic disciplines. Furthermore, what is the home for sport studies if not kinesiology? Is “physical activity” allowed to have *any* specific contents? It is true however that if the humanities are not part of the core curriculum there will soon be no “two cultures” problem, because there will be no humanists left in kinesiology departments. In other words the fragmentation and dismantling of kinesiology departments that Rikli laments may be the logical outcome of her own philosophy.

<sup>15</sup> An amusing but disturbing instance of this can be found in the *Quest* article “Sociology of Sport: Expanding Horizons in the Subdiscipline.” (2006) Author Janet C. Harris takes the liberty to clean up the CV of Sport Philosopher Scott Kretchmar, by labeling him a “physical activity philosopher” (p. 86). Ironically enough Harris' whitewash of Kretchmar's qualifications occurs in a section of her paper where she lauds his insistence on the “importance of encouraging people to go beyond duty and fun in order to experience richer meanings in physical activities” (p. 85). Harris apparently fails to consider the fact that specificity might have something to do with “richer meanings.”

<sup>16</sup> Departments of music are not called the department of “rhythmic activity” nor are Art departments thrown into paralysis over the fact that their title is actually “too broad.” For they know and are unashamed of their subject matter, whatever it is called. “Art” means, sculpture, painting, drawing, ceramics, etc, even though in actuality the term could encompass everything from dance, to film, to carpentry. In so far as “physical activity” is trumpeted implicitly or explicitly on the grounds that it hides, embellishes, or legitimizes our subject matter, such a label is a mistake. Although such “deception” could be argued for on strategic grounds, it comes at too high of a cost, that of the field's own self-understanding.

For if it turns out that a commitment to “physical activity” is incapable of holding the field together, it would be unfortunate if it came to light after the fact, that such a level of abstraction was unnecessary. It would also be unfortunate to find out that the commitment to scientism was itself a function of faulty epistemic reasoning built on an inadequate metaphysical understanding of motion. Perhaps the insistence on abstraction is a symptom of the very scientific understanding of objectivity that Polanyi found so misleading. A faulty epistemology encourages such abstraction because abstraction functions as an obtuse but presumably legitimizing disguise for the field.

My specific interest then is in investigating the particular metaphysical and epistemic commitments that make up this foundation of kinesiology, particularly regarding the nature of our subject matter, and the bifurcation of the two cultures within the field. Clearly answers to these questions will have a profound impact on how the field defines itself, as well as on more practical matters such as curriculum design, hiring practices, research design, and outreach. Potential answers and recommendations for the future of the field will be an outcome of clearing away some of the brush surrounding the philosophic foundations of kinesiology.

I believe that the work of both Aristotle and Polanyi provide essential tools for addressing these dilemmas and the philosophic foundation(s) that support them. Aristotle’s understanding of *kinesis*, as well as Polanyi’s reformation of epistemology shed vitally needed light on the path towards a

vibrant and reconciled field. Two cultures in kinesiology is not inevitable.

Although Snow may have gone too far in reifying the two cultures, his fundamental proposition is alive and well in departments of kinesiology. All too often there is an atmosphere of mistrust and misunderstanding among scientists and humanists in the field (Hughson & Tapsel, 2006); (Booth, 1997).

A review of doctoral programs published by AAKPE (2006) or American Academy of Kinesiology and Physical Education reveals one quantifiable reason many scholars are concerned about the future of the humanities in kinesiology. According to AAKPE's data, there are approximately 212 total program options at the 61 kinesiology doctoral institutions in the United States. The number is approximate because some programs failed report what options they offered. Of these 212 options only 15 - or 7.1% - can be characterized as programs in the humanities.<sup>17</sup>

Additional evidence can be found in the recent article "Sociology, History, and Philosophy in *The Research Quarterly*." (Sage, Dyreson, & Kretchmar, 2005). The authors point out that during the *Research Quarterly*'s seventy five plus years of publication, the humanities have played only a bit part in the journal. The situation is particularly dire for philosophy. Since 1935 *Research Quarterly* has "printed only seven philosophic essays, or one article every ten years" (p. S-99).

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<sup>17</sup> To arrive at these numbers, I included sociology, sport studies, and history and philosophy of sport in the definition of humanities. These statistics include variants on the three general categories above such as, The University of Maryland's "Sport Commerce & Culture," and The University of North Carolina's "Sociohistorical Studies of Physical Activity."

While this can be partly explained by the emergence of sub-disciplinary journals that siphon work away from *Research Quarterly*, it cannot fully explain the neglect of the humanities in the journal. Sub-disciplinary journals exist across the entire spectrum of kinesiology, yet other areas such as physiology or biomechanics seem to be immune to the same under-representation in *Research Quarterly*.<sup>18</sup>

In addition to Snow's concern regarding the two cultures, many other important contributions have been made to the scholarly literature that directly impact kinesiology. This literature examines the relationship of the sciences and the humanities in the Academy, discusses the nature and history of kinesiology, and illuminates the important role that philosophic commitments play in the discipline. Reviewing this work should lay a foundation for the impending discussion of the nature of *kinesis* and the nature of knowledge in kinesiology.

In most of Aristotle's major works, he begins by reviewing what has been said by his predecessors, to see what if anything was said well and what had at least partial grasp of the truth. Aristotle believed such a review was important because we all find ourselves in the middle of things, with a particular human inheritance. For the same reason, following Aristotle's method, I will begin this investigation and critique of the metaphysical and epistemic foundations of

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<sup>18</sup> Nor is it ultimately effective to argue that there are far greater numbers of biomechanists and exercise physiologists in kinesiology than there are philosophers or historians in kinesiology. A bigger pool of scholars will certainly produce more articles, but this still begs the question, "why are we training so few humanists in the first place?" Perhaps it is because the humanities are considered to be of secondary importance in the field.

kinesiology by reviewing the relevant literature and history from both inside and outside the field of Kinesiology.

This review will begin with C.P. Snow's *The Two Cultures* (1959) and the controversy surrounding it. Following Snow I will discuss some of the history of kinesiology and physical education. This history includes debates going back into the early twentieth century, regarding the proper place of science in the field. I will focus on the work of James Bryant Conant (1963), and Franklin Henry (1964) who are considered critical players in transition from physical education to kinesiology. This historical analysis will show that the questions regarding the unsettled nature of the field are not new. This is also the case with questions regarding the proper relationship of the sciences and the humanities in the Academy.

After reviewing this history, I will proceed to review a few of the contemporary discussions of the "two cultures" thesis. This analysis will start with the work of B. Alan Wallace (2000, 2007) who, building on the work of American philosopher William James, argues for a broader and more inclusive definition of science itself. Following on the heels of Wallace will be an evaluation of *The Hedgehog, the Fox, and the Magister's Pox* by scientist Stephen Jay Gould (2003), who argues that reconciliation between scientists and humanists must be built on mutual respect, as well as the notion of "NOMA" (2003, p. 87), or "non-overlapping magesteria."

Closing out the literature review will be an analysis of vitally important articles from within the kinesiology literature itself. One set is well known, while the other has received comparatively little attention. First are Karl Newell's (1990a, 1990b, 1990c) *Quest* articles on the topic of renaming and reorganizing the field. These essays had, and continue to have, a significant impact on the field's own self-understanding, as well as on the widespread adoption of the name "kinesiology" in departments around the United States. Two lesser known articles by Anderson (2001, 2002) are vital as well. While Newell (1990, 2007) acknowledges the importance of the actual practice of physical activity, Anderson *demand*s that activity in "Gym Class" (the actual practice of moving) provides a fundamental and human form of *knowledge*.

## **Literature Review**

### **"The Two Cultures"**

C.P. Snow published *The Two Cultures* in 1959. His book, a condemnation of the fractured state of the academy, was originally given as a Rede lecture at Cambridge University in the spring of 1959. The book caused an immediate stir, including both negative and positive reactions. Most of the negative reaction focused on his specific analyses rather than his more general assertion of existence of two cultures in the academy. Some criticism did attack Snow's paradigm as an oversimplified dichotomy that left no room for the existence of other "hybrid" groups in the academy such as social scientists. Snow himself

acknowledged his dichotomy as a useful but “dangerous” characterization (1959, p. 9).

In the body of the work, Snow argued that there was “a gulf of mutual incomprehension” (1959, p. 4) between proponents of the sciences and the humanities. This gulf was mutually harmful. Scientific imagination was stunted, while across the great divide, the literary intellectuals were inclined towards pessimism, as well as ignorance of the role that knowledge of the natural world played in informing and improving culture.

Accordingly Snow scolded humanists for being “natural luddites” (p. 22), as well as enemies of the industrial revolution. “If we forget the scientific culture, then the rest of western intellectuals have never tried, wanted, or been able to understand the industrial revolution, much less accept it” (p. 22). The danger created by such romanticism was that it limited human potential and encouraged stagnation in areas of the world that were desperate for improvement.

Snow believed - not without reason - that the greatest hope of mankind lay in the advance of science, technology, and industry. He argued that it was easy to criticize industrialization from within the comforts it had created. It was quite another thing, absent such progress, to see for example, “most of your children die in infancy” (p. 25). Industrialization and the scientific revolution had all but eliminated hunger, reduced infant mortality, and increased life spans in the West. It followed, Snow argued, that eliminating the gap between rich and



poor nations in the rest of the world was simply a matter of educating and organizing “enough scientists and engineers and technicians.” (p. 45)

While his work is insightful, particularly regarding the academic tensions between scientists and humanists, Snow can be criticized from many angles. Snow’s chief detractor was Cambridge professor Dr. F.R. Leavis, who was deeply concerned about the educational merits or demerits of Snow’s emphasis on science. The substance of Leavis critique was recently addressed in a *Quest* article by John Hughson and Christin Tapsell (2006). Hughson and Tapsell point out that Leavis was concerned both by what he saw as the low quality of Snow’s argument, as well as by the weight given to the argument of - what Leavis viewed as - a mediocre intellect. Leavis also worried about the utilitarian overtones of Snow’s concern for economic development. Culture, Leavis opined, was not reducible to material gain (Hughson & Tapsell, 2006, p. 414).

Snow was right of course to point out the very real benefits of economic development but his faith in science and technological development as the standard bearers of progress does seem, especially in retrospect, naïve. Certainly material gain was not without merit. But science and technology do not exist in a vacuum. Social, political, and cultural values are as important as technology in the advancement of human societies. Technology is an impotent force, for instance, absent the rule of law. The journal *Nature*, commenting on the fortieth anniversary of Snow’s lecture, made exactly this point. The editors of *Nature* charged Snow with “optimistic technocratic naivety” (1999, p. 91).

Economist and historian Thomas Sowell eloquently elaborates the force of this sentiment when he asserts that,

“Third World nations have within themselves both physical assets and human assets far exceeding any that they are likely to receive from other countries. This is not to say that it would be easy politically to reform the policies and institutions which hold back internal economic development in the Third World. What is easy politically is to accept foreign aid and use it to help keep existing political leaders in power, whether or not the foreign aid has any significant effect on the economic condition of the country as a whole” (2004, p. 355).

Polanyi also commented on Snow’s lecture, although he took a very different approach than did Leavis. Instead of attacking Snow’s qualifications or utilitarianism, he simply advanced a full frontal challenge to Snow’s underlying thesis.

“Sir Charles Snow complains about the gap between science and the rest of our culture. I concur. But I see the problem in a different perspective. I don’t agree that the influence of science on the rest of our thoughts is too feeble. On the contrary, the claims made today on the minds of men in the name of science are comprehensive” (1969, p. 40).

Polanyi then went on to elaborate how scientific rationalism has subsumed all claims regarding human morality under a naturalistic explanation that “must ignore, and so by implication deny, the very existence of human responsibility” (1969, p. 42). According to Polanyi, Freud and Marx, two of the most formative thinkers of modernity, built their reductionist theories on the grounds of supposed scientific legitimacy. Marx reduced man to a function of economics and class struggle, while Freud made man a “bundle of appetites” (1969, p. 43). Echoing his recently completed work on tacit knowledge in his magnum opus

*Personal Knowledge* (1962), Polanyi closed the critique by insisting that “a humanistic revisionism can be secured only by revising the claims of science itself” (1969, p. 46).

### **Conant, Henry, and the Birth of Kinesiology**

An appreciation of the power of Snow’s lecture and the boldness of Polanyi’s counter claim is deepened by remembering the historical context in which the debate was held. Sputnik, the world’s first artificial satellite was launched by the Soviet Union on October 5<sup>th</sup>, 1957 and caused an immediate stir in the West.<sup>19</sup> Soviet superiority in science and technology seemed self-evident.<sup>20</sup> Although there were voices cautioning a more comprehensive reform of education,<sup>21</sup> the general reaction to the launch in the United States was to demand increased time and money spent on math and science in American classrooms. Catching up to the Soviets was considered a matter of both national prestige and national security.<sup>22</sup> Given this context, Polanyi’s decision to challenge an already robust scientific hegemony is even more noteworthy.

In reaction to Sputnik, President Eisenhower established a “Science Advisory Committee”, which among other things suggested federal scholarships

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<sup>19</sup> “Soviets Fire Earth Satellite into Space; It is Circling the Globe at 18,000 m.ph.; Sphere Tracked in 4 Crossings Over U.S.”, *New York Times*, October 5, 1957, p. 1.

<sup>20</sup> “Soviet Claiming Lead in Science”, *New York Times*, October 5, 1957, p. 2.

<sup>21</sup> “THE EDUCATED MAN”, *New York Times*, November 12, 1957. p. 36.

<sup>22</sup> James Reston, “The U.S. and Science; An Analysis of Lessons to Be Learned From Soviet Achievements in Space Assumption of Superiority Drastic Security Curbs President 'Surprised'”, *New York Times*, November 6, 1957. p. 13.

for qualified students in mathematics.<sup>23</sup> After consulting with some scientific advisors Eisenhower announced at an October 30<sup>th</sup>, 1957 press conference his goal of “awakening the United States to the importance and, indeed, the absolute necessity of increasing our scientific output of our colleges and universities.”<sup>24</sup> Two days later Eisenhower commented that “The growing needs of our economy, defense and community life require an ever increasing emphasis on the training of future engineers and scientists.”<sup>25</sup>

It was in the midst of this politically charged milieu that the work of former Harvard president James Bryant Conant and University of California professor Franklin Henry was published. Both are commonly credited with spurring physical education in the early 1960s toward academic and scientific respectability. The picture the actual historical record reveals however is more complex.

James Bryant Conant undoubtedly ranks as one of the giants of twentieth century higher education. His influence extended from teaching and research to administration and educational reforms. Despite the general historical importance of Conant’s huge body of work, his 1963 text, *The Education of American Teachers* attracts the most attention of sport historians and

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<sup>23</sup> Milton Estrow, “Dr. I.I Rabi Presses Scholarship Plans”, *New York Times*, November 11, 1957, p. 1.

<sup>24</sup> John W. Finney, “PRESIDENT TO AID DRIVE FOR SCIENCE; U.S. Educational Campaign to Stress to Public the Need to Spur Research President Endorses Plan”, *New York Times* October 31, 1957. p. 11.

<sup>25</sup> Homer Bigart, “STRESS ON SCIENCE IN SCHOOLS URGED; Educators Advise on Need to Keep Pace With Soviet --Backed by Eisenhower Salaries Plea Endorsed Cooperative Plan Urged”, *New York Times*, November 2, 1957, p. 8.

kinesiologists. In this text Conant offered what many historians generally consider an extremely critical attack on what was then called physical education. According to conventional wisdom Conant's criticism of physical education – particularly physical education graduate programs – prodded a reluctant discipline into academic respectability and diversity. John Swanson and Richard Massengale begin their well respected volume, *The History of Exercise and Sport Science*, by stating that Conant's words “sent shock waves through, and a challenge to, the field” (1996, p. 1). Such thinking is reiterated by nearly all of the other chapter authors in their anthology. Sport historian Nancy Struna's comments on Conant are of particular interest. “No history of a subdiscipline to which physical educators have contributed can ignore James Conant, the president of Harvard University,” She emphatically states. Although the specifics of the argument would take us too far afield, I have argued elsewhere there are important reasons to question this interpretation of Conant's impact on kinesiology (May 2007). I am convinced that Conant's impact on the field, even if noteworthy, is overstated. It is physical educators' own philosophic insecurity that is most noteworthy. Unfortunately the impact of their own reaction to Conant has been largely ignored.<sup>26</sup>

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<sup>26</sup> The headlines of the *New York Times* after all, which announced Conant's reforms, did not scold physical education. Rather, they lamented, “Teacher Training Scored by Conant as U.S. Scandal.” In fact, no mention of physical education appears in the text of the newspaper articles. This suggests that the reaction of physical educators to Conant's criticism, says more about what the discipline thought about itself than about outside pressure causing reform. Indeed, Conant's criticisms of physical education amount to only a few paragraphs out of two hundred pages. Such sensitivity on the part of physical educators implies a far deeper vein of disquiet than could have been instigated solely by Conant.

In fact, calls to “liberalize” or humanize the field as well as calls to “intellectualize” the field by making it more scientific both preceded and followed Conant’s critique -- and such calls continue today. To properly understand the transformation of physical education into kinesiology historians must look both beyond and before the work of James Bryant Conant. The increased emphasis on science did not create, but rather rekindled, one side of the debate regarding the nature and purpose of physical education. Calls to “scientize” physical education went back at least to the dawn of the twentieth century.

Coming on the heels of Conant’s criticism of the discipline in *The Education of American Teachers* was another landmark publication, *Physical Education: An Academic Discipline* by Franklin Henry (1964). In this article, Henry claimed that proper academic status for physical education would only come by grounding the discipline in theory. Henry argued that “an academic discipline is an organized body of knowledge collectively embraced in a formal course of learning... the content is theoretical and scholarly as distinguished from technical and professional” (p. 32). Henry continues, “The development of personal skill in motor performance is without question a worthy objective in itself. But it should not be confused with the academic field of knowledge” (p. 33). The field would not be recognizable without “personal skill in motor performance” yet according to Henry’s own paradigm, such skill does not

actually count as knowledge. In other words, physical education is academic as long it ignores the actual practice of skilled physical activity.

Philosopher Doug Anderson's recent analysis of Henry's claim that there are such limitations on "knowing" in kinesiology is noteworthy. Anderson points out the costs of committing the field solely to a "theoretical" and "scientific" self-definition. Additionally Anderson's analysis makes clear how such thinking rests on philosophic roots that have been chosen not imposed.

"From a humanist's perspective, the attempt to lift physical education out of the university ghetto by making it predominately scientific seems somewhat peculiar. Such a move accounts for and overcomes a previous blindness of physical education programs to the scientific dimensions of movement. Kinesiology takes these seriously and makes students accountable for them. But such a redemption seems incomplete. It leaves the rest of physical education just as it was. The humanities of movement remain marginalized because they are not scientific in any strict or positivistic sense; they are not simply identifiable as 'fields of knowledge.' Furthermore, movement courses themselves remain in the ghetto as 'just gym classes.' Implicitly if science is the way to save physical education, the rest of its features must become ancillary at best." (2002, p. 89)

A recognizable shift towards science surely took place in physical education in the 1960s, and as Anderson points of this shift to science has been good in many ways,<sup>27</sup> but these ideas and this debate long preceded Henry or Conant. If this is correct, Conant's criticisms – no matter their impact – immediately become subordinate to this larger question. In other words

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<sup>27</sup> "The sciences are important, and the thrust of Henry's essay is that they have been neglected. At the same time, however, honoring science to the exclusion of the humanities of movement can have disastrous consequences; specifically it bodes an inattentiveness to the creative and disciplinary features of movement experiences that yield personal and social meaning.", (2002, p. 89).

criticisms are impotent without a reaction to them. Trying to understand why and how physical educators reacted to Conant reveals more than Conant's criticisms themselves. For the reaction speaks volumes about what philosophical values drove the evolution and growth of physical education in twentieth century America.

Perhaps no scholar has done more to illuminate the foundations of American physical education than Roberta J. Park. As Park points out repeatedly, the field of physical education in America was born at the knee of medicine, and was most often sold on the grounds of being either hygienic, preventative, or both (2005).

In two important articles, *Research Quarterly and its Antecedents* (1980) and *Of the Greatest Possible Worth* (2005), Park points out many instances of this urge that predate Conant. Charles W. McCloy is perhaps the paradigm example. In 1928, McCloy argued that the adoption of a scientific research methodology would "presage a new day in physical education, and make of it a mature science." (Park, 1980, p. 3) This was not the first time McCloy had such thoughts. In 1921 he stated that the field would rise or fall on its adoption of the scientific method. "Physical educators are not infrequently criticized- and justly- for a lack of scientific method in their procedures" (Park, 2005, p. S11). McCloy's insistence on research and academic rigour, are in many ways (like Henry's), quite admirable. The danger as Anderson points out is in believing that this is the only



respectable way to understand the field. Yet even Anderson's argument is not new. In fact, these ideas pre-date Conant as well.

Several pre-Conant calls to humanize the field; (i.e. treat movement, play and games, as inherently human activities that are of intrinsic worth), can be identified. Eleanor Metheny and Lois Ellfeldt for instance, wrote in 1960, three years before Conant's report that:

“Without belittling in any way the physiological and social concomitants of man's movement experiences, we value our theory because it identifies structured movement experiences as a source of mental-emotional concepts that are not only significant but essentially unique forms of human knowledge and understanding...Physical education – or as we prefer to call it ‘movement education’ – can be identified as one of the forms of liberal education, comparable with music and other non-verbal arts as the source of one of the kinds of meaning that enrich man's comprehension of reality as he knows it.” (Metheny & Ellfeldt, 1961, pp. 289-290)

Visible evidence of the importance of “man's movement experiences” reaches back into antiquity (Miller, 2004). For those who are willing to pay attention, the visceral appeal of play and games throughout history offers important evidence of the intrinsic importance of physical education. The ubiquity of games and play across time and culture is not a matter of historical dispute. Nor should their near universal appeal be in doubt. As Jesse Feiring Williams wrote in 1959 regarding the proper focus of physical education, “There seems to be one: stress at all times and everywhere the need of man for play, recreation and wholesome leisure” (p. 78).

The resulting turn toward “intellectual” and scientific conceptions of the field, seems to be as much a result of this unsettled foundation, as it was the result of genuine need for reform. As Roberta J. Park insists concerning these older uncertainties, “at the turn of the [twentieth] century the American Association for the Advancement of Physical Education was by no means a stable organization with a clear sense of direction” (1980, p. 1). Many would say the same thing about the field of kinesiology today. The current trends in Kinesiology towards a scientific and technical self-understanding are not the byproduct of necessary and inevitable forces, nor are they the child of one moment or of one man’s criticism. Rather contemporary kinesiology is the product of value-laden historical commitments, which have been and continue to be, matters of contention.

The importance of recognizing this reality should be clear. The two cultures in kinesiology are not inevitable in any sort of deterministic sense. Nor are the currently dominant materialistic conceptions of *kinesis* and knowledge required historical outcomes. If these commitments were and are choices, rather than inevitabilities, then these choices are open to potentially fruitful examination. Such an inquiry is needed to see if these commitments are justifiable.

## Voices from Outside Kinesiology

Some such examination - most notably outside the field of kinesiology- has taken place regarding merits and demerits of scientific materialism, as well as the reconciliation of the two cultures in the academy. Religious studies scholar B. Alan Wallace has written widely on the subject of scientific materialism. *The Taboo of Subjectivity*, (2000) and *Contemplative Science* (2007) are two of his most important works. In both books Wallace lays out and critiques “the essential principles of Scientific Materialism” (2000, p. 21).

Wallace begins his description of the materialist world view by laying out its basic premise. “The physical world is the only reality. It originates wholly from impersonal natural forces; it is devoid of any intrinsic moral order or values; and it functions without the intervention of immaterial spiritual forces of any kind, benevolent or otherwise” (2007, p. 29). Wallace then turns his attention to the consequences such a metaphysical system has for living things. “Life and consciousness originally arose in this universe purely by accident, from complex configurations of matter and energy. Life in general, and human life in particular, has no meaning, value, or significance other than what it attributes to itself” (2007, p. 29). Following quickly on the heels of an accidental and arbitrary origin for life is the reductive notion that human experience, motivation, and values can be explained by chemistry and physics. “During the course of an individual’s life, all desires, hopes, intentions, feelings, and so forth – in short, all

experiences and actions- are determined solely by the body and the impersonal forces acting upon it from the physical environment" (2007, p. 29).

What evidence is there then that such a description of the universe, even if granted plausibility, is or is not conclusive? Wallace counters the materialistic account of the world by questioning four of its most basic tenets; objectivism, reductionism, the closure principle, and physicalism (2007). Objectivism and reductionism are essentially self-explanatory. The real is that which is empirically testable and demonstrable. The real can be found in underlying causes. Physicalism, the claim that only matter and energy exist, is perhaps the materialists' most central tenet. The closure principle, following from the other three premises, indicates that all material events are the function of a closed loop; that is, they are, and can only be, caused by other material events (Wallace, 2000, 2007).

Wallace responds to the materialistic challenge, by arguing that these four principles are metaphysical beliefs not scientific facts. He then goes on to argue that there is good reason to believe these metaphysical commitments are in fact mistaken. The four founding principles of materialism are metaphysical because they make fundamental claims about the nature of reality. These principles, have not, and cannot, be put to a strict empirical test. There is no experiment that can demonstrate that the material world constitutes the sum total of reality. There is no experiment that can prove that only the measurable is real. It is a commitment

born of a particular *interpretation* of the evidence.<sup>28</sup> Hence, right or wrong, the tenets of scientific materialism are judgments, not scientific facts. Furthermore Wallace argues that the philosophy of materialism predates the scientific revolution, reaching back into both ancient Greece and ancient India (2000). It is a mistake then to think that materialism was a simple and inevitable product of the scientific revolution.

Wallace goes on to point out that objectivism like many of the other principles of scientific materialism, functions like a self-fulfilling prophesy. “Prioritizing the reality and significance of purely objective phenomena devalues subjective experience to such an extent that it is commonly regarded as a mere epiphenomenon of the objective physical processes that ‘underlie’ it” (2007, p. 34). It should not escape notice that despite scientific materialism’s dismissal of consciousness, the “prioritization” of objective phenomena is itself a conscious decision. The ability to prioritize is either a function of consciousness or it is a fiction. The self-contradiction should be apparent. If materialism is true, no such prioritization is possible. If such prioritization is possible, materialism is not true. While the danger of finding only what one is looking for is certainly not limited to the proponents of materialism, the danger is common in this metaphysical system, especially given its commitment to reductionism.

“There is nothing in the laws of physics that predict the emergence of life in the universe. If physicists were to confine their research to the

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<sup>28</sup> Who and what could have “the power of interpretation” in a purely material world is a problem rarely addressed by the adherents of scientific materialism.

theoretical and empirical methods of physics alone, ignoring all that has been learned from the life sciences, they could neither define nor empirically detect the presence of living organisms” (Wallace, 2007, p 35).

Wallace believes that subjectivity; that is, our experiences as conscious human beings that love, wonder, dream, grieve, and hope have become unjustifiably marginalized by a metaphysical dogma that cannot account for the reality of these experiences. For this reason, Wallace endorses (following William James), an alternative conception of empiricism. This conception of empiricism embraces all experience - not merely the quantifiable - as real. This alternative methodology allows for the study of consciousness as a legitimate area of scientific study and does not attempt to reduce conscious experience to mere underlying material causes.

“According to James’s radical empiricism, the whole range of perceived objects- from the macro-objects of common sense experience to the minute objects perceived with scientific instruments- are accepted at face value, without attributing to any of them the property of absolute, or intrinsic existence” (Wallace, 2000, p. 66).

Wallace contends that the mental training and discipline found in most Buddhist meditation practices creates the opportunity for a scientific investigation of consciousness. This would be accomplished through introspection made possible by the refined attention capabilities of meditation practice. Such introspection would then be appropriately empirical, and should moderate the belief that the material is the sum total of reality. According to Wallace, reconciliation among scientists and humanists will occur when a larger contingent of each camp is willing to return to the primacy of experience

unfettered by dogmatic claims, whether religious or materialistic in nature. Such a return will reveal the insufficiency of reductionistic answers. Meditative contemplation “may take on a mediating role between science and religion” (Wallace, 2000, p. 187), because of its ability to produce an “empirical study of the mind, unconstrained by the dogmatic principles of scientific materialism and all other religious creeds”<sup>29</sup> (Wallace, 2000, p. 188).

Stephen Jay Gould, a scientist by trade, continues to push in the direction of fair-minded inquiry in *The Hedgehog, the Fox and the Magister's Pox: Mending the Gap between Science and the Humanities*. Gould's analysis is interesting and sympathetic to the humanities. Yet his solutions remain problematic and his analyses still retain some materialistic overtones and habits.

Gould believes that much of the opposition between the sciences and humanities is built on false dichotomies. The scientific revolution is grounded one such false dichotomy, which all too often is characterized as “a bad ‘before’ replaced by a good ‘after’” (2003, p. 13). Not only do these kinds of assertions not stand up to historical scrutiny, they also create a dangerous compartmentalization of knowledge in an increasingly complex world.

Likewise, Gould argues, the “war” between science and religion is largely a historical fiction. Most of the key players in the scientific revolution were

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<sup>29</sup> Ironically, Wallace's strident anti-dogmatism does, in and of itself, seem a touch dogmatic. It often seems that Wallace has forgotten that “Percepts without concepts,” as Kant pointed out, “are blind” (A51/B75). One must have some conceptual framework to work with or experience becomes nothing more than noise. Wallace's larger point of fair minded inquiry however is no doubt a profitable insight. Inquiry should be fair, but it can never be disinterested.

religious believers, many with orthodox convictions. Gould is fully convinced that the “the standard episodes in the supposed warfare of science and religion are either greatly distorted or entirely fictional” (2003, p. 88). For example, Columbus supposed conflict with the religious authorities over a flat earth is entirely fictional. “Christian consensus had never lost or challenged Greek and Roman knowledge or the earth’s spherical shape” (2003, p. 88). The debate actually regarded the diameter of the earth, a point on which Columbus’s detractors were actually correct.

Such false dichotomies between science and the humanities are not only historically wrong, they are, Gould proclaims, wrong in principle.

“In briefest summary no dichotomous opposition can exist in logic because science and religion treat such different (and equally important) aspects of human life- the principle that I have called NOMA as an acronym for the ‘non-overlapping magisteria,’ or teaching authorities, of science and religion. Science tries to record and explain the factual character of the natural world, whereas religion struggles with spiritual and ethical questions about the meaning and proper conduct of our lives. The facts of nature simply cannot dictate correct moral behavior or spiritual meaning” (2003, p. 87).

In other words, Gould believes that scientists and humanists are answering two different kinds of questions, and must therefore respect the bounds of their own knowledge domains.<sup>30</sup> Gould believes the two camps get into trouble when they believe they can answer each other’s questions, and the trouble only grows, when they attempt to do so. On this point, Gould is both

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<sup>30</sup> In practice, I would argue the idea of “NOMA” actually encourages scientists and humanists to ignore one another, as non-overlapping questions are by nature irrelevant to each other.



right and wrong. “The facts of nature simply cannot dictate,” but they certainly do implicate! His own assertion that the “facts cannot dictate correct moral behavior” bear this out. For such an assertion is referencing “facts” to justify a conclusion about how we *should* approach scientific data. Facts whether scientific or otherwise always impact our understanding of right action. Unfortunately, Gould seems uncomfortable granting factual status to any answers related to the “proper conduct of our lives.”<sup>31</sup>

Whether or not, for example, second hand smoke causes harm to other people has a huge bearing on the ethical status of public smoking bans. Whether or not, and how steroids impact athletic performance has the same sort of real implications. These are two relatively trivial and uncontroversial examples, but similar factual import could be found in most any contemporary ethical dilemma. Gould’s intuition is correct however, in seeing a distinction between gathering data and interpreting it. Data do not and cannot speak for themselves. Whether clear-cut or ambiguous, one must always ask the question, “What does this mean?” The very recognition of a clear-cut example is itself a judgment about the meaning of the data. Arguments between scientists as well as arguments between the two cultures are often a function of disagreement over what is a correct or reasonable interpretation of data.<sup>32</sup>

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<sup>31</sup> The danger is as Polanyi points out, that “In fact, its [science’s] criteria of objectivity must deny reality to any moral claims. No chemical analysis or microscopic examination can prove that a man who bears false witness is immoral” (1969, p. 46).

<sup>32</sup> The supremacy of data as the final arbiter of knowledge is another common point of contention.

Despite Gould's concern that dichotomous thinking is driving the two cultures apart, his own system of NOMA itself appears to be dichotomous. Consider Gould's description of the relationship between facts (science) and values (humanities).

"Facts may enrich and enlighten our moral questions...but facts cannot dictate the answer to questions about the 'oughts' of conduct or the spiritual meanings of our lives. If we keep these *distinctions* clear, then nature's *unpleasant* facts, as ascertained by science, pose no threat to human studies" (2003, p. 106).[Emphasis Added]<sup>33</sup>

Gould's solution to the two cultures rests upon a clear *distinction* between fact and value.<sup>34</sup> In other words it rests upon a dichotomy. If Gould's assertion that facts have little to no bearing on values was true, it is unclear how scientific facts could ever be seen as "unpleasant", for the facts should have no bearing (pleasant or unpleasant) on values.

It is of course easier to live with such a dichotomy when one resides, as Gould did, on the "factual" side of the fence. Although not intended, his dichotomy even comes across as patronizing. "Science operates," Gould opines, "in a the different domain of factual understanding" (2003, p. 141). It is as if Gould is saying "Do not worry. Values are in no way factual, so my facts are no

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<sup>33</sup> It worth noting that Gould does not consider the converse of his claim that "facts may enrich and enlighten our moral questions." Is it not possible that values enrich and enlighten our understanding of facts?

<sup>34</sup> Alasdair MacIntyre comments on this point in relationship to Aristotle in *After Virtue*. "On [Aristotle's] view the facts about human action include the facts about what is valuable to human beings (and *not* just the about what they think to be valuable); on the [mathematical] view there are no facts about what is valuable. 'Fact 'becomes value-free...'" (1984, p. 84).

threat to your values.” How does the implication that values are idiosyncratic and unrelated to the natural world not threaten their importance? At the same time however, Gould freely admits that,

“this myth of objectivity- the belief that scientists achieve their special status by freeing their minds of constraining social bias and learning to see nature directly under established rules of the ‘scientific method’ – drives a wedge between science and the humanities” (2003, p. 107).

Gould seems then, to be of two minds. His sympathy for the humanities is always tempered by his overriding allegiance to empiricism.

Notwithstanding the sometimes muddled thinking apparent in Gould’s argument, he does make some insightful points. He has an authentic respect for the humanities and a real concern for their decline. “I am sad that I can no longer cite the most common lines from Shakespeare or the Bible in class, and hold any hope for majority recognition” (p. 150). More importantly he genuinely wants reconciliation. Gould believes that if scientists “would admit the ineluctable human character of their enterprise,” and humanists would accept that science increases “the storehouse of genuine knowledge” that the two sides could learn to “break bread together” (p. 108). These assertions seem to be essentially on target, but it is worrisome that Gould fails to insist that scientists must also recognize that humanists increase “genuine knowledge”. While Gould’s argument contains inconsistencies, he certainly had his fingers near the pulse of the problem. His efforts and willingness to respectfully engage the humanities in conversation must be applauded.

## Voices within the Kinesiology Literature

Unfortunately, the same cannot be said of the kinesiology literature, which often fails to directly address the epistemological and metaphysical underpinnings that impact the definition of the field. More often one sees subtle manifestations of the two cultures problem or of methodological or epistemological assumptions that have not been explicitly thought through (McFee, 2007). Such unexamined presuppositions regarding the nature of kinesiology are so common that egregious and some might even say offensive assertions are often not even noticed in the kinesiological literature. Because of this, opportunities for real insight, growth, and mutual understanding are missed.

Two brief examples from the February 2007 issue of *Quest* should suffice to make my point. The first is from McCullagh and Wilson's article "What Should Students Know?"

"In our opinion, a well-rounded kinesiology program should offer courses from all these areas. As we are well aware, however, many programs are heavy on the biological side of the scale and slight on the humanities side partly due to the greater funding sources available to the biological fields" (p. 51).

Now, although many humanists will feel that this is a gross understatement, it is certainly reasonable to assume that one of the reasons the humanities are slighted is due to a lack of research funding opportunities. Yet the point should not, and cannot, be left at that! Several deeper and more important questions need to be asked if one is *really* concerned about, and committed to, the

importance of the humanities in kinesiology. The title of the article is after all, “What Should Students Know?” not “What will Attract Funding?”

What, for example, are the other reasons the humanities are slighted? One can only presume that if McCullagh and Wilson can recognize that such de-emphasis is “partly due” to research funding, they must have some inkling of other possible influences. Why are these other possibilities not mentioned? Why are there funding disparities in the first place? What do the funding disparities say about the larger culture’s philosophy and values? Are such values justified? Do schools that are not primarily research institutions give any more attention to the humanities than schools that are? If not, why not? Presumably, research funding dollars would be a moot point at most if not all of these institutions. If the disparity continues to exist at smaller institutions then the initial assertion itself can be called into question. There must be some deeper reason for the precarious position in which the humanities find themselves. By not focusing on such deeper questions an important opportunity to clarify and understand the current state of the field is missed.

A second example is provided by Michael Wade’s article “Quo Vadis Kinesiology” (2007) in which he regularly refers to entire field as the “physical activity sciences” (p. 171). Wade asserts that the key to moving the field forward is not unity of purpose but rather unity of voice.

“Now that we have gained admittance into the NRC [National Research Council], it is time for us to seriously revisit the challenge of forming a single comprehensive body to represent our field...Creating a ‘big tent’ to

accommodate all elements of *the physical activity sciences* is not a new idea and requires only a fundamental commitment to adopt a succinct name for our field of study and refer to it as kinesiology. *We should worry less about the development of the body of knowledge...and focus solely on developing a unified voice*" (2007, p. 172). [Emphasis mine]

One cannot help but wonder about what Wade envisions this "unified voice" rallying around? Why exactly is it so important to develop a unified voice if our self definition is so unimportant? On what philosophic grounds, other than crass utilitarianism, would such an assertion make *any* sense? Perhaps on the grounds that one has already implicitly endorsed science as the rallying point? But how then does "physical activity sciences", even if read generously, encompass a "big-tent"?

While such superficial thinking that ignores the deeper philosophic questions at play in the field of kinesiology can be seen as symptomatic of the very problem, the situation may not be as bleak as it seems. Some important articles have also been written on the nature and mission of kinesiology which directly address metaphysical and epistemological questions, and give kinesiology the opportunity to make principled decisions about the future of the field. Among the most important are the work of Karl Newell (1990a), (1990b), (1990c), (2007) and Doug Anderson (2001, 2002).

Karl Newell's (1990) *Quest* articles on the topic of renaming and reorganizing the field are of extreme importance. As mentioned previously, these articles profoundly impacted the direction of the field, and also led to the widespread adoption of the name "kinesiology". Newell's recent follow-up

article (2007) essentially reiterates his previous position. For that reason I will focus mainly on the 1990 articles.

Newell's two most enduring and important points in these articles are that the heart of the discipline can and should be "physical activity" and that the appropriate name for the field should be kinesiology. Newell conceives the state of the field as fractured mainly due to misunderstandings over the sub-disciplines commonalities, which are best expressed under the rubric of physical activity. "This situation is due in part to the fact that there no longer appears to be a central theme that constrains and organizes the traditional field of physical education in higher education" (1990b, p. 243).

Newell believes that physical activity "very broadly defined" (1990b, p. 247) is the most inclusive and appropriate label for the field on the grounds that, "there are political and economic advantages to pursuing a broad physical activity agenda" (1990b, p. 247). Newell argues that such an inclusive definition allows for, and recognizes an already broad research agenda. This in turn creates a more integrated (and academic) pursuit of the different knowledge types in which the field engages; the declarative, or "knowing-that" versus the procedural or "knowing-how." A more limited definition of the field, Newell insists, would stunt such symbiosis.

"If exercise and sport are the only activity subdomains of the broader physical activity category to be studied, then it is likely that their focus will largely be applied research. One would expect scientific theories to be general to physical activity and not particular to, for example, activities that are constructed as sport. This is not to propose that sport does not

provide some different and interesting constraints to action. Rather, it proposes that an overarching goal of academic fields is the establishment of general theories of physical, natural and social phenomena” (1990b, p 247).

Interestingly enough, even while making his case, Newell does point out some worrisome tendencies in the field that nonetheless fit into his schematic. These include the “increasing trend” (1990b, p. 250) towards a theory dominated field, as well as the deterioration of the “value of physical activity as traditionally examined and understood by the humanities” (1990b, p.250). At least the humanities are, by relying on theory, appropriately academic. Procedural knowledge (know-how) has fared even worse. Newell argues that this is because of “the failure of performance oriented-scholars to articulate the basis of procedural knowledge” (Newell, 1990b, p. 257), a contention for which Newell is later criticized by Anderson.<sup>35</sup>

Building on his assertions regarding the pragmatic advantages presented by “physical activity”, Newell opines that the name of the field should likewise change to Kinesiology (1990c). Similar to his previous argument regarding physical activity, he argues that kinesiology is appropriately inclusive, unlike titles that include “sport” or “exercise.” Kinesiology also sounds academic and

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<sup>35</sup> “But this is to ask procedural knowledge or know-how to be what it is not, to measure it by a standard that is not appropriate to it. It is a kind of category mistake...The practice of movement, like the practices of music, art, poetry, and teaching, is the basis of any theorizing about movement and it is ultimately the site of any testing of theory” (Anderson, 2002, p. 94).



scientific.<sup>36</sup> Finally, the title kinesiology does not carry the cultural connotations or philosophical baggage of a more traditional name such as physical education. In fact, following a post-modern theory of language, Newell suggests that the word kinesiology allows for absolute malleability. “Because *kinesiology* is vague, it can mean whatever the field is about” (Slowikowski & Newell, 1990, p. 289). Members of the field then are free to market themselves however they choose under the new rubric or “commodity” of kinesiology. Kinesiology as a brand name “identifies its owner with a certain style and way of doing things” (Slowikowski & Newell, 1990, p. 290). Newell seems unconcerned that the cost of this cultural panache may be a field emptied of significant unifying content.

Despite these problems in Newell’s argument, there is certainly weight to such pragmatic concerns, even if couched in the distastefully superficial trappings of post-modernism. My contention regarding the shift to kinesiology will not be to challenge the adoption of the name, but rather will challenge what the field understands the name kinesiology to mean. I happily concede and endorse kinesiology as the appropriate name for the field. The impact that this name choice has on the meaning and nature of kinesiology is quite another matter.

Regarding the endorsement of “physical activity,” as the core of the field, the main bone to pick again regards the meaning of the term, and whether or not

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<sup>36</sup> As we have seen, Latash is not shy about proclaiming the need for kinesiology to become a hard science. “Motor control (and kinesiology) should help itself and by 2050 become a respected science.” (Latash, 2008, p. 29).

it is actually, both in theory and practice, too broad a characterization of the field's core. In practice, physical activity thus defined has led to inanities. For example, in the textbook "Introduction to Kinesiology" (2000), the definition of physical activity, following Newell, includes everything that admits of being "intentional, voluntary movement directed toward achieving an identifiable goal." This definition includes "typing, handwriting, sewing, and surgery" (Hoffman & Harris, 2000, p. 8). Accordingly, when sport and exercise "receive primary attention" it is not because of any inherent relationship to the field, but because, "kinesiology is historically linked to physical education"<sup>37</sup> (Hoffman & Harris, 2000, p. 11). Under such a paradigm, the relationship between sport and kinesiology is precarious indeed.

It is worth pointing out that this definition of "physical activity," in principle, also includes first and second degree murder, sexual intercourse, and not meaning to be crass, defecation. All of the aforementioned activities are motor-oriented, intentional, voluntary, and directed towards a goal. The exclusion of these types of areas from active study in kinesiology is apparently purely arbitrary and historically contingent. Newell himself acknowledges this problem, but so quickly dismisses the charge as to appear cavalier. More importantly, Newell never really addresses the concern. Instead he avoids

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<sup>37</sup> Setting aside the issue of contingency; if kinesiology is really about physical activity, then using the historical relationship to physical education as a justification of sport and exercise remains problematic. For if physical activity is the core of the field, then even the historical affinity of physical education for sport and exercise is in need of reform, which is exactly what Newell suggests (1990c, p. 277).

answering by counter-charging that the same level of ambiguity exists in the term “physical education” (1990b, p. 246).

Daryl Siedentop (1990) incisively critiques Newell’s concern for inclusion. Siedentop also predicts that such an emphasis will negatively impact the two cultures in kinesiology.<sup>38</sup> Siedentop argues that Newell’s analogies regarding department names - Dept. of Christianity which Newell argues is too exclusive vs. Dept. of Religion which Newell favors – are both unconvincing and dangerous.

“The more appropriate term for Newell’s analogy would be *department of belief* since belief, like physical activity, is sufficiently inclusive. Religion, like sport, is a cultural institution, an expression of human social organization and life. Physical activity, like belief, is a more fundamental phenomenon, without the restrictions that define cultural institutions such as religion, sport, art, music, or drama. The more restricted definitions, of course, are precisely what infuse those fields with shared meanings, allowing persons within the field to pursue often diverse work that is still clearly interrelated...physical activity, whether intentional or not, is largely devoid of cultural meanings and therefore lacks the restrictive boundaries within which shared meanings provide scholars with reasons to value diverse work and, on occasion, with reason to work together” (1990, p. 316).

Siedentop reminds kinesiologists that for all the important benefits of defining the field’s core as physical activity, there are also important, perhaps even prohibitive costs. Yet, as persuasive as Siedentop is, his criticism should not lead kinesiologists to re-open the name wars. The fight over terminology is not as important as what motivates the selection of the terminology and what that

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<sup>38</sup> “And it is the mistake [‘physical activity’ being devoid of cultural meaning] (for that is what I believe it to be) that will make kinesiology departments increasingly hostile places for the social sciences and humanities” (1990, p. 316).

terminology signifies. If, the proponents of the term physical activity are unashamed of the central role of play games and sport in kinesiology then the label makes sense. If they are not, then I am convinced they will only bring disintegration to the field. Even Hoffmann and Harris, who apparently are true believers in Newell' thesis, admit that sport and exercise are kinesiology's primary focus, why then hide from it? It is my contention that the desire to hide from, or mask the important role of sport in kinesiology is a function of misunderstanding *kinesis*; both metaphysically and epistemologically.

The powerful influence of play, games, and sport as a cultural institution is clearly articulated in philosopher Doug Anderson's articles, "Recovering Humanity: Movement, Sport, and Nature," (2001) and "The Humanity of Movement or 'It's not Just Gym Class'" (2002). In "Recovering Humanity," Anderson reminds kinesiologists of the power of sport experiences to wake one to their own humanity. Anderson laments that "Civilization insofar as it becomes merely habitual, has the tendency to eliminate our spontaneity and make us automata" (2001, p. 141). The creative and embodied nature of sport, has the potential to counteract such sedation, by creating "borderland" experiences between sleepy "over-civilization" and brutish "under-civilization" (2001). Anderson emphasizes the role sport can play in self-understanding.

"In such instances, I think it is fair to say that sport and movement allow us to realize and re-create ourselves. By this I don't mean that we come to some final consummation of being, but that we bring our full range of powers and energies to life- we become fully human" (2001, p. 145).

As Anderson points out in his second article, "The Humanity of Movement", gym class is then anything but a triviality in kinesiology.

Anderson claims that the growth of the sciences in kinesiology was a valuable and intrinsically important development. Nonetheless, this growth was philosophically flawed. The growth of the sciences was in part an attempt to "produce respectability on two fronts" (2002, p. 88). The first front, following Henry, was academic respectability. The second front was utility, which led to Michael Ellis's famous claim that "physical education will be reconceptualized as a retail service" (1987, p. 84).

Anderson laments, the tendency of scientific generalization and reductionism to marginalize the humanities of movement. The actual practice of movement is a humanizing experience that must be treated as such, rather than ignored or explained away. For in such experiences, "we aim at excellence and virtuosity; we encounter limits and failures; we learn the 'thisness' of movement, not just the theoretical 'how' or the 'what'" (2002, p. 91). The 'thisness' of the experience is imperative, for "this good [of movement experience] cannot be argued for nearly so well as it can be felt in the actual experiences of moving" (2002, p. 93). The magic of "chasing-down a fly ball in the gap" cannot be fully captured by description; whether verbal or mathematic, mechanistic or artistic. It must also be felt.

Echoing Siedentop, Anderson argues that such specific movement experiences are what can create a "new passion for the profession" (p. 95). This

new passion “must come from the perennial heart of its studies, from reawakening to the experiences of movement” (2002, p. 95). The humanities are essential to kinesiology. “If kinesiology is to be fully redeemed, science must be complemented by the humanities of movement – the features of movement experience that generate, disclose, or develop personal and social meanings and virtues” (2002, p. 91).

Such an assertion of course leads full circle, back to the initial questions raised at the beginning of this chapter. For the assertion that moving is a humanizing experience raises fundamental questions about the nature of motion itself; particularly regarding the relationship of motion to our humanity. This in turn will raise question about what it is to be a human being. According to Anderson, the human experience of moving whether on the ball field or in the dance studio cannot be trivialized, nor can it be reduced to the math and science of atomic particles. What of motion itself? How should it be understood? Can Aristotle’s definition of *kinesis* be appropriately described and defined in the terms of geometry and physics? What does *kinesis* mean? What role should the concept of *kinesis* play in its namesake, the discipline of kinesiology?

## Chapter 2- Aristotle & *Kinesis*

The prolific breadth and enduring stature of Aristotle's impact on the heritage of Western thought is beyond doubt. Yet how and why Aristotle *remains* relevant, rather than merely an object of historical importance, may be more contentious. Why should one pay attention to the work, particularly the scientific work, of a philosopher who was born four centuries before Christ? After all, Aristotle's work is nearly twenty-five hundred years old. How could a philosopher from that long ago, during a "pre-scientific" age, have insights that matter today? What contemporary relevance could Aristotle's definition of motion, found in the *Physics*, have on the field of kinesiology?

Likewise, why should Aristotle's definition of motion even be taken seriously? If his description makes some *philosophic* sense, does not the success of modern physics over the last three hundred years necessarily mean that his definition of *kinesis* does not and cannot make *scientific* sense? On the other hand, upon reflection it seems clear that modern physics is no less philosophically entangled. And entangled really is not the proper term, for the term suggests a negative relationship between philosophy and science. Science is, has been, and always must be philosophically committed. Any form of inquiry, description, or explanation needs ultimate terms of discourse to get off the ground.

"Nothing stands on its own, without connections, and no event happens in isolation; there must be some comprehensive order of things in which things are what they are and do what they do. Physics seeks to

understand only a part of this whole, but it cannot begin to do so without some picture of the whole" (Sachs, 1995).

Likewise, evidence needs interpretation. Evidence, absent contextualization, is mere noise. By questioning some of these necessary philosophic commitments, which have often been taken for granted in the modern view, Aristotle's philosophy might enrich, alter, or complement our contemporary understanding of kinesiology.

In addition, Aristotle makes a unique and important contribution to the field of kinesiology in his attempt to define *kinesis* (motion) (Brague, 1990; Sachs 1995). For even if the "pre-scientific" charge holds, there are few alternatives to Aristotle, if one wants an in-depth examination of the meaning of *kinesis*. As Aristotle scholar Joe Sachs points out, "Aristotle is perhaps the only thinker who has ever attempted to define motion, rather than merely describing it or denying it" (1995, p. 78).

Some readers may question the assertion that Aristotle is the only thinker to offer a definition of motion. Is not the definition of motion common sense? Does not everyone already know what motion is? Is it not clear that motion is "when things *move* from place to place." But such a definition is obviously circular, and is therefore more accurately labeled as a description of the phenomenon rather than a definition of it. And that is exactly what Sachs means when he asserts the uniqueness of Aristotle's achievement. Aristotle is one of the few investigators of the phenomenon of motion who felt motion was more than a



cause of things, but itself had a cause. Unlike many of his modern philosophic descendents, Aristotle did not believe motion was one of the “ultimate terms of discourse” (Sachs, 2006). That is, motion was not a “brute fact” (Sachs, 1995, p. 80) of the universe, but itself had a foundation.

Inquiry regarding the definition of motion is of particular importance to the field of kinesiology, because *kines-iology* has heretofore taken the idea of human motion as self-evident, without fully investigating what *kinesis* as defined by Aristotle actually means. Continuing to ignore what one of the founders of western philosophy had to say about the nature of motion would be a mistake, particularly given the current state of upheaval in the discipline. For even if Aristotle’s position is ultimately worthy of rejection, such a decision should not be made in ignorance. Furthermore, it may be turn out upon examination, that Aristotle’s work *is* worthy of being taking seriously.

Although a small amount of research was done in the early twentieth century concerning Aristotle’s biological writings and their impact on kinesiology (biomechanics was called kinesiology at that time) (Braun, 1941); (Chryssafis, 1930), Aristotle has largely been ignored by kinesiologists. Certainly Aristotle’s definition of *kinesis* remains unexamined in the kinesiology literature.

Aristotle's definition of *kinesis* is of particular interest to kinesiologists not only because it is unique, but also because, a reconception of motion in line with Aristotle's more holistic definition encourages the reconciliation of the humanities and the sciences in the field. If motion is more than atoms bouncing around in space, then kinesiology is more than the crude materialistic version of natural science upon which kinesiologists all too often hang their hats. But before getting into the definition of *kinesis*, and how it could encourage reconciliation, I must first overview some of the key tenets of Aristotle's general methodology and vocabulary in an attempt to better situate the impending discussion of *kinesis*.

Aristotle was a careful and critical thinker. Yet Aristotle's philosophy was not driven solely by logic but also by observation. This can easily be seen from his biological and scientific writings but is also present in his more theoretical works. This concern for the importance of observation can be seen in the *Physics* where Aristotle insists that "in all pursuits in which there are sources or causes or elements, it is by way of our acquaintance with these that knowing and understanding come to us" (184a102). As a consequence, "it is necessary to proceed from what is general to what is particular, for it is the whole that is better known by perceiving" (184a30). In other words the world of perception and experience was primary despite the fact that such perception was less capable of articulation than an a posteriori (after the fact) account based on reason. Sound thinking rose out of the muddle of experience toward an

organized account of that experience. Philosophy (and science) were not only to rely on theory, but to test and develop their theories by proceeding from “what is *less* clear by nature but clearer to *us* to what is clearer and better known by nature.” (Physics, 184a24). Philosophy did not proceed from first principles but proceeded from everyday experience up towards first principles.<sup>39</sup>

As a result, learning and inquiry were for Aristotle a dialectical process; a reasoned ordering of our perception, thinking, and experience in pursuit of understanding. Commenting on Aristotle’s dialectical methodology, Sachs observes that “Aristotle’s writings always undertake the work of the learner, for whom the preliminaries have not been fully settled and the consequences are not fully determined” (2002, p. xiv). Consequently, Aristotle was willing to admit the reality of philosophic impasses,<sup>40</sup> not only as a reminder of the necessity of humility, but also as a stimulus for further inquiry (Metaphysics, 995a24). Impasses were a spur to wonder (Metaphysics, 982b10-15). Knowledge was not only a matter of searching for new or better answers but also looking back and reflecting on previous answers and old questions.

“And it is right to feel gratitude not only to those whose opinions one shares, but even to those whose pronouncements were more superficial, for they too contributed something, since before us they exercised an energetic habit of thinking. For if there had been no Timotheus, there is much lyric poetry we would not have had, but were it not for Phrynus, there would have been no Timotheus. And it is the same way too with

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<sup>39</sup> The notion of “first” then becomes, as Joe Sachs points out, a “deep ambiguity” (2002, p. xiv). Everyday experience is first in the “order of inquiry”, but metaphysics is first in “the order of knowledge.”

<sup>40</sup> The Greek word translated here as impasse, (following Sachs) is *aporia*, which is also commonly translated as “puzzlement.”

pronouncements about truth; for we have inherited certain opinions from certain people, but others have been responsible for bringing them about” (Metaphysics, 993b15-20).

Following such thinking it seems clear that Aristotle’s definition of *kinesis* itself deserves closer inspection by those who have adopted the term for the name of their profession. I am convinced that by engaging Aristotle’s argument, kinesiologists will get a better grip on themselves. Kinesiologists need to understand his argument. Then the profession can honestly adjudicate whether his work is “an opinion one shares,” or something “more superficial.” In either case, progress will be made toward clarifying what it is that kinesiologists are in the business of professing.

According to Aristotle, motion is the *entelecheia* of a *dunamis* as *dunamis* (Physics, 201a10), the being-at-work-staying-itself of potency as potency. Motion (*kinesis*) is a function of the self maintaining activity (*being-at-work*) of both beings in the world and the cosmos as a whole. It is through such activity that beings maintain themselves. Motion is the means by which things remain actively whole. Animals for example, remain whole in relationship to the potencies (*dunamis*) inherent in them. A fish if it is to remain a fish needs water; a tree needs sunlight, etc. Yet the water and sunlight are not in and of themselves enough to maintain the fish’s or the tree’s existence. Instead, the potency made possible by the water for the fish and the sunlight for the tree, must be actualized. For a fish to remain a fish it must continually be at work maintaining its “fishness” through swimming, eating, breathing, etc. It is in this process of

actualization, or better put being-at-work, that we see motion. Motion is therefore potencies at work as potencies.

Motion, according to Aristotle, is not the mere dislocation of mass in space. Instead, Aristotle argues that there are four basic types of *kinesis* that correlate to the type of change we see in the world. Change of quality, change of quantity, change of place, and change of being. However, motion is not synonymous with change, but rather a co-extensive means by which that change occurs. This is why *kinesis* is the *dunamis* of a *dunamis*. Motion is not the change a potency makes possible but rather the activity of that potency just as a potency. It is the activity through which beings express their potencies.

Fully understanding descriptions such as the one I have just written takes time. Writing such a description is almost as difficult as understanding it. Although Aristotle is not intentionally obtuse, approaching his thinking is difficult because of its profound depth as well as its foreignness to modern cognitive habits. We post-moderns are just not used to thinking like Aristotle. In order to further clarify Aristotle's definition of motion it is imperative to flesh out the meaning of the Greek terms (and English equivalents) that make up the definition itself.

Similarly it will be fruitful to review what some other philosophers have said about Aristotle's definition of motion. This should contextualize as well as clarify the differences between the alternative conceptions of motion proposed by Aristotle and his critics. The chapter will proceed accordingly. The

clarification of Greek terms will be followed by an extended discussion of Aristotle's definition of motion; in terms of fleshing out what it means, in drawing out some of the implications for kinesiology, as well as contrasting it with the more mechanistic contemporary understandings of motion. This discussion should shed light on how well Aristotle's views stand up after twenty-five hundred years. The chapter will then close by arguing for the explicit connection between an Aristotelian conception of motion and a humanistic understanding of kinesiology that embraces both the sciences and the humanities, by taking the causative power of human-being-at-work seriously.

I will generally use the English equivalents of the Greek terms, as translated by Sachs, rather than the more familiar Latinized translations; i.e. I will use "being-at-work" rather than the more traditional "actuality." Given the familiarity of the term, as well as the central role *kinesis* plays, I will use motion and *kinesis* interchangeably when referring to Aristotle's definition of motion. When referring explicitly to change of place, I will use the term locomotion. Sachs's translations, while initially awkward to the ear, better capture the dynamism of the Greek originals. This dynamism is a central key in understanding the meaning of *energeia*, and *entelecheia*, which Sachs translates as being-at-work and being-at-work-staying-itself respectively.

The scientific idea of "dynamic equilibrium" may be a useful introductory metaphor for understanding being-at-work and being-at-work-staying-itself. In an evaporation cycle, given the right conditions, water is

replaced as fast as it evaporates. This suggests something very similar to being-at-work. In such an evaporation cycle the water level remains constant through the continual process of evaporation and condensation. Being-at-work is analogous to this type of cycle in that being-at-work is also a type of constancy through change.

A more direct comparison between the two ideas is problematic however. For a dynamic equilibrium is essentially a balancing of elements, while being-at-work is matter of wholeness, a fusion of form and material expressing itself in the world. Dynamic equilibrium then is a useful but incomplete heuristic device. Being (*ousia* in the Greek), as understood by Aristotle, is not a matter of balancing parts, but rather self-maintenance through activity. It is this activity that allows beings to remain what they are. It is, for example, through such things as eating, sleeping, breathing, thinking, perceiving and moving from place to place, that a human being has its life. Hence the term being-at-work-staying-itself (*entelecheia*), expresses the idea of a dynamic wholeness that being-at-work (*energeia*) makes possible.<sup>41</sup> Again, it is through activity that beings *remain* what they are. Sachs offers an insightful comment on this active stillness that is at the heart of being-at-work, as well as on the danger of the Latinized translation unrecognizably distorting the meaning of Aristotle's most central term(s).

"In the usual translations *energeia* [being-at-work] crumbles away to nothing as "actuality." Any hope of recapturing it through its near

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<sup>41</sup> Entelecheia could also be translated as being-at-work-staying-*whole*.

synonym is lost, since these translations render *entelecheia* [being-at-work-staying-itself] also as “actuality.” Does the word give you any hint that Aristotle is responding to the call made to the philosopher by the Eleatic Stranger in Plato’s *Sophist* (249 C-D) to approach being by thinking rest and motion together? Does it convey a stable condition that can be achieved only by ceaseless activity? Does it describe a motion that leads nowhere but back into itself? The Latin word *actualitas* may have performed those services for a reader of Latin, but its English cognate means nothing that remotely suggests them” (2002, p. xl).<sup>42</sup>

Although being-at-work may initially appear to be a clunky-hybrid that sounds rough to the ear rather than like a smooth translation of the Greek, being-at-work expresses the central tenet of Aristotle’s philosophy far better than more traditional translations such as “actuality.”

The other key Greek term that must be clarified before one can get a better grasp on Aristotle’s definition of motion is *dunamis*, or potency. Potency, as defined by Aristotle is “a source of change in another thing or in the same thing as other” (*Metaphysics*, 1049b7-10). Potencies are innate tendencies striving to express themselves given the right conditions (*Metaphysics*, 1049a15-20). Potency is a natural rather than random a condition of material. That is, material strives to take on a form for which it has an innate potency.<sup>43</sup> Human beings beget human beings for example –given the appropriate conditions- from a particular human potency that is a function of human being-at-work (*Physics*, 202a10-12). Again, it must be emphasized that these potencies are not accidental

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<sup>42</sup> For an in-depth discussion of why Sachs avoids the more traditional Latinized translations see his introductory essay to his translation of the *Physics* (1995) and *Metaphysics* (2002).

<sup>43</sup> This should align itself quite well with one’s experience in the world, despite the fact that people are used to thinking of “matter” as inert. Houses are built out of bricks and lumber rather than Jell-o not as a matter of coincidence but because of an innate lack of potential in Jell-o as a construction material.



and random but are a function of and make possible the being-at-work of which they are a part.<sup>44</sup> As Sachs points out in the introductory commentary of his translation of the *Physics*, “for Aristotle motion is not a brute fact of sensation, but built into the very structure of *being*” [Emphasis Added] (1995, p. 80).

Returning then to the definition of *kinesis* – the being-at-work-staying-itself of potency as potency- one can begin to see how Aristotle’s definition of *kinesis* implies a holistic understanding of both nature and the human person. Being-at-work is not an idealistic mind-at-work nor a blind mechanism-at-work, but a composite activity where, “the highest level of material and the form are one and the same thing” (Metaphysics, 1045b18). Motion necessarily entails a union of form and material. As Aristotle insists, a purely material explanation actually *explains* very little.

“For no matter how much every coming-into-being and destruction is out of some one or more kinds of material, why does this happen and what is its cause? For surely the underlying material itself does not make itself change. I mean, for example, neither wood nor bronze is responsible, respectively, for its own changing, nor does the wood make a bed or the bronze a statue, but something else is responsible for the change. But to inquire after this is to seek that other kind of source, which we would call that from which the source of motion is” (Metaphysics, 984a20-28).

It is clear that Aristotle’s account of material is much different than that of a materialist’s account (whether ancient or modern). As Aristotle points out, many of his predecessors were materialists (*Physics*, 194a20). But for Aristotle,

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<sup>44</sup> For example, human being-at-work makes possible the potency for contemplation. Contemplation as far as we can tell is a particularly human characteristic. Yet this particular human characteristic is impossible without the potency of nutrition and the particular nutrients that sustain the being-at-work of human beings.

material is not independent of form nor is form independent of material. Rather they both make up an integrated whole, which is encountered in the world as a being-at-work, which is the source of motion(s). Again Sachs' description of Aristotle is instructive.

“[Material] should never be called matter, by which we mean something that stands on its own with a determinate set of properties (has weight, occupies space, preserves its state of motion in a straight line). What Aristotle means by material, on the contrary, is (1) not inert, (2) not necessarily tangible, (3) relative to its form, which may in turn be material for some other form, (4) not possessed of any definite properties, and (5) ultimately a purely 'ideal' being, incapable of existing in separation, which would be rejected by any 'materialist.' Form, in turn, does not mean shape or arrangement, but some definite way of being-at-work” (1995, p. 21).

Motion is the conduit by which this union of form and material takes place. Through *kinesis* (the expression of potencies as potency) material moves toward and maintains form. For human beings, motion is a fundamental aspect of human nature, encompassing all that human beings are and do. To cease moving, in this richer Aristotelian sense, is not simply to become sedentary, but to cease being human. It is death. According to Aristotle motion allows for change not only of place, but also quality, quantity, and perhaps even being (Physics, 200b35). By changes of quality, quantity, and being, Aristotle has things in mind such as the ripening of fruit, growth & decay, and the assimilation of one type of being (apple) into that of another (human) that takes place in, for instance, nutrition.<sup>45</sup>

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<sup>45</sup> In true dialectical form, Aristotle later qualifies this last sense of motion (change of being) on the grounds that the change is not really continuous transition between two contrary states, but rather a change from one contradictory state to another (225b8-10).

“The being-at-work-staying-itself of whatever is potentially, *just as such*, is motion: of what is alterable, as alterable, it is alteration, of what can grow and its opposite, what can shrink (since no name is common to the two), it is growth and shrinkage, of the generable and destructible it is coming-to-be and passing away, and of the moveable in place it is change of place” (Physics, 201a10-15).

Because the ability of potencies to actively express themselves is in a real sense dependent upon appropriate conditions, the concept of place plays an important role in Aristotle’s account of motion and being-at-work, for place helps or hinders, makes possible or impossible, the potentialities inherent in human beings, which are functions of human being-at-work. Human beings, like other animals, are not indifferent to place.

The places in which animals (and humans) find themselves are not merely arbitrary positions on a geometrical grid, but are rather as philosopher Nathan Anderson asserts, “Dynamic Boundaries” (2004), where the potencies and being-at-work of the animal interact with the environment.<sup>46</sup> “Unlike geometrical spaces, places are not indifferent to that which they contain. Indeed, they seem to have a kind of power. For unless something interferes, things gravitate naturally toward places that suit them” (p. 5). Habitat matters to living things. Anderson continues, “A fish out water soon ceases to be a fish, and, in general, living substances can only preserve and maintain themselves given the stable existence of several characteristic environmental conditions” (p. 5). One of the ways in

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<sup>46</sup> This Aristotelian description of place fits well with Kretchmar’s idea of “growing playgrounds”(2005). There is a dynamic relationship between the player and the playground, built on the potencies available and how they are developed in the player.

which animals go about maintaining themselves is through the power of self-motion (locomotion) which itself is enabled or inhibited by place. The aforementioned “fish out of water” flops helplessly because it is literally *out of place*, and so being, has lost the poetic dexterity it expresses when in water.

For humans too, our being in the world is not indifferent to place. We also need to find the “right kind of places” in which to maintain ourselves. Our motions in the world (nutritive, metabolic, locomotive) matter, and matter a great deal. Yet human places, in concert with human being-at-work, produce, if we pay attention, more than self-maintenance. Or perhaps more properly put, the human self-maintenance *kinesis* makes possible is more than mere “crude biological homeostasis.”<sup>47</sup> Anderson asserts that human places are richer still.

“This suggests that for Aristotle, just as the places occupied by animals are spaces of perception, movement, and appetite drive, the place that human beings inhabit together is primarily a space of conversations, a space of shared memories, and shared thoughts: a space of reason” (Anderson, 2004, p. 21-22).

It is worth noting that one such human place of “shared memories” found around the world and throughout human history are play places,<sup>48</sup> which themselves are not indifferent to human attributes and skills.<sup>49</sup> Certainly play

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<sup>47</sup> This is not to suggest that such biological realities are unimportant or sub-human but rather that they are in and of themselves not a self-sufficient description of *human* motion. It is to such an assertion of “material sufficiency” that the adjective “crude” applies. If one wanted to make the same point with a spiritual twist, one might assert that “man does not *move for* bread alone.”

<sup>48</sup> I am of course using the term play here in its broader more colloquial rather than proper philosophic sense.

<sup>49</sup> Baseball is not played underwater; Hockey does not work well on the beach, a pool can be a place full of dread for the novice swimmer, etc.

places are not the only places that fit Anderson's description, but such forms as dance, games, and sport, do seem to reflect a profound marriage of locomotion, place and reason. These are *places* where intentional human movement occurs to express and create human meaning(s). Kinesiology is a poorer field if it insists on studying locomotion or place in a purely abstracted and detached manner. For human beings do not and cannot move for purely abstracted and detached reasons. Likewise purely abstracted and detached places do not exist.<sup>50</sup>

Aristotle's definition of motion offers a richer and more human understanding of our being in the world. At the same time it is grounded in experience and is neither idealistic nor materialistic. Materialistic explanations that refuse to engage the reality of, and need for, consciousness are insufficient descriptions of human experience in the world. Idealistic explanations that see value only in the life of the mind are equally problematic descriptions of actual human living.

It is true of course that one cannot prove in a strictly empirical sense –that is by measurement- that Aristotle is on to something, but that is, in another sense, part of his point. There is more to the world than the measurable! “Look around and see,” Aristotle wants to say, “Reflect on your experience in the world, not just your theories, and pursue what makes sense.” I am convinced

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<sup>50</sup> There may of course be good scientific reasons to try and isolate variables by “sterilizing” an environment, as part of research design. The key is in remembering that such sterilization took place when considering how much descriptive weight to put behind the results.

that such *honest* reflection (itself an intangible) vindicates the value of pursuing Aristotle's insights into motion.

Yet, despite my conviction regarding the importance of Aristotle's work on kinesiology, it would be naïve to suggest that objections have not been raised against Aristotle's definition of motion. For instance, a tension appears to exist between what Aristotle says in the *Physics* and *Metaphysics* concerning the proper understanding of motion. In the *Physics*, Aristotle deals directly with the definition of *kinesis*, which he defines as the being-at-work-staying-itself of potencies as potencies. Motion (because it is a being-at-work) is complete, a whole. However in Book IX of the *Metaphysics*, Aristotle makes what appears to be an alternative claim. While discussing the relationship of being-at-work and potency, Aristotle states that motions (in contrast to actions) are incomplete. How then can motion be considered a being-at-work-staying-itself? Are these two discussions as contradictory as they appear?

In addition, some confusion regarding Aristotle's definition of motion has resulted from the Latinized translation of his definition; (the actuality of a potentiality just as such).<sup>51</sup> Is it not the case that motion, if it is to be a motion, is by nature transitory? But actuality, as used in this definition, would seem to necessarily be rest rather than motion. How else could motion be an actuality?

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<sup>51</sup> It is obvious in this instance why translating both *energeia* and *entelecheia* synonymously creates so much confusion.

Consequently, two important objections to Aristotle's thinking on *kinesis* that I will discuss. First, has Aristotle initiated a vain quest? Is any definition of motion even possible? Second, are Aristotle's separate discussions of *kinesis* found in the *Physics* and the *Metaphysics* irreconcilable?

The charge that Aristotle's definition of motion is incoherent has led to a complete rejection by many modern philosophers of the possibility of defining motion (including Aristotle's attempt). Sachs points out in his excellent article on "Motion and Its Place in Nature," (2006) that such thinking gained its earliest expression in the work of philosopher and mathematician Rene' Descartes.

"At the opposite extreme is the young Descartes, who in the first book he wrote announced that while everyone knows what motion is, no one understands Aristotle's definition of it. According to Descartes, 'motion . . . is nothing more than the action by which any body passes from one place to another' (Principles II, 24). The use of the word 'passes' makes this definition an obvious circle; Descartes might just as well have called motion the action by which a thing moves. But the important part of Descartes' definition is the words 'nothing more than,' by which he asserts that motion is susceptible of no definition which is not circular... The point is not that one cannot construct a non-circular definition of such a term, one claimed to be properly irreducible, but that one ought not to do so" (Sachs, 2007).

According to Cartesian philosophy, as well as much of the modern philosophy that followed, motion was an ultimate term of discourse, a simple, foundational and material reality. It was the dislocation of bodies in space (Sachs, 1995, 2007).

Can this apparent choice between incoherence and circularity be overcome? Or is the modern position as advanced by Descartes the most defensible understanding of motion?

The first criticism, that of incoherence, begins to fade once one begins to glimpse the meaning of being-at-work. Motion remains what it is through activity. The translation given to the terms *energeia* and *entelecheia* is key to making Aristotle's definition of *kinesis* plausible. Motion remains what it is by being at work. It is not a static actuality, but rather an activity that maintains its wholeness through change. The charge that Aristotle's definition of motion is incoherent rests essentially on a misunderstanding of his terms, encouraged by a translation built on the Latin tradition rather than the original Greek (Sachs, 1995).

The second charge, that of circularity, is in a sense a function of the first. At least insofar as one claims that Aristotle's definition suggests that any rational account of motion *must* be circular. In other words, if Aristotle's account can be shown to be coherent, one is free to weigh whether it is a better, more accurate and more valuable description of how one encounters the world. Circularity, as proposed by Descartes, is reasonable, but not self-evident. It is a commitment, not a given. Therefore one is free to consider Aristotle's assertion that motion *can* be defined, rather than merely described.

Difficulties remain however, even after clarifying translation problems, because Aristotle seems to be contradicting himself when he calls motion complete in the *Physics* and incomplete in the *Metaphysics*. Are there ways to reconcile, explain, or deepen our understanding of these two different accounts of motion? I will attempt to show that there are.



By describing motion as both complete (in the *Physics*) and incomplete (in the *Metaphysics*), Aristotle seems to throw his own definition into doubt, independent of how his key terms have been translated. In the *Physics*, *kinesis* is clearly called an *entelecheia* or being-at-work-staying-itself. In the *Metaphysics* however, Aristotle asserts that activities where the end is outside itself (such as losing weight) are motions (*kinesis*) and incomplete, while activities (such as sight) where the ends are inside themselves are actions (*praxis*). “And it is appropriate to call the one sort of action motion, and the other being-at-work. For every motion is incomplete: losing weight, learning, walking, house-building. These are motions, and are certainly incomplete” (1048b29-31). Losing weight is a motion towards a specific state, while an action, such as sight, is a complete whole, remaining what it is through activity – hence Aristotle labels it a being-at-work. How then can a motion which is “incomplete” be a type of being-at-work-staying itself? How might one make sense of this apparent contradiction?

One way to address such concerns it to return to the *Physics* for a closer inspection of the definition of *kinesis* in Book III. Here Aristotle argues that an adequate understanding of nature hinges on a proper understanding of motion, “Since nature is a source of motion and of change, and our pursuit is for nature, we must not let what motion is remain hidden” (200b12). Aristotle’s concern for the relationship of motion to nature is in part a response to paradoxes regarding motion advanced by two of his predecessors, Zeno and Parmenides. They argued

that any account of motion was either self-contradictory or incoherent.<sup>52</sup> In other words, as previously mentioned, it seems impossible for something transitory (i.e. motion) to have any positive content? Would not any definition of motion, by pinning it down as something concrete, prove that motion was illusory (i.e. it was actually rest). The *Physics* concerns an attempt to describe and understand whether or not there are any causes or sources of being for the natural world. And if a coherent account of motion is not possible then there can be no coherent (non-accidental) account of nature.

Aristotle is not unaware of this difficulty and in fact directly addresses the problem of motion's indeterminacy in chapter two of book III of the *Physics*.

"Motion," Aristotle concedes, "seems to be something indefinite" (201b27).

Aristotle then follows this concession with a profound assertion regarding the relationship between incompleteness and his definition of motion.

"And the reason motion seems to be indefinite is that one cannot place it as a potency of a thing or a being-at-work. For neither the potency to be this-much nor the activity being this-much is necessarily a being-moved; so motion seems to be a certain being-at-work, but incomplete. *The reason for this is that the potency of which it is the [complete]<sup>53</sup> being-at-work, is itself something incomplete*" (201b29-35). [Emphasis Added]

The key insight comes from understanding the final sentence of the section quoted above. Motion as the being-at-work of potencies is complete, while the potencies themselves are by nature incomplete. For motion to remain what it is-

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<sup>52</sup> Zeno asserts that motion when examined, is always "at" a given point, meaning it is actually always at rest. Parmenides argues that the transitory nature of motion proves its own illusory nature, for being can not "not-be". Non-being by definition has no positive content.

<sup>53</sup> This bracketing is not my insertion but is present in the English translation.

(potency expressing itself as potency)- it must, as that expression, be incomplete. It is a being-at-work-staying-itself, but it is the being-at-work-staying-itself of potencies. *Kinesis* in contrast to actions (*praxis*) has its end outside itself.

Further contextualization of this point can be found in the *Metaphysics* where Aristotle directly addresses the relationship of potencies and being-at-work. Potency is to “the one who can build” as being-at-work is to “building” (1048b). So being-at-work takes “precedence” over potency (1050a5). Potencies such as the power to build are a function of the being-at-work of a builder.

Aristotle insists that, “it is not in order that they may have the power of sight that animals see, but they have [the power of] sight in order to see” (1050a10). Motion is an *entelecheia* in so far as it is actively at work staying itself as motion. But *kinesis* always serves the larger being-at-work of the being(s) which “give life” to the potencies that make such motion possible. Motion on Aristotle’s account has a cause, which is, as Sachs points out, a direct contradiction to the mechanistic thinking of Descartes and Newton.

“Once Aristotle’s central thinking has been grasped, one can see that the physics that emerged in the seventeenth century adopted, in the principle of inertia, an understanding of being exactly opposite to that of Aristotle. The primary beings are what they are passively, by being hard enough to resist all change, and they do nothing but bump and move off blindly in straight lines. The picture of the world assumed by this physics is of atoms in a void, so there can be no cosmos, but only infinite emptiness; no life, but only accidental rearrangements of matter; and no activity at all, except for motion in space” (1995, p. 21).

Aristotle in contrast argues that being is not inertia, but rather being-at-work.

Insofar as being is being-at-work, such being requires and legitimates motion.

That is, motion becomes intelligible as the expression of the potencies of beings. Returning to a previously quoted section of Sachs, motion “is built into the very structure of being.” In so far as motion is at work staying motion, it is also an *entelecheia* (a being-at-work-staying-itself), but only in a subordinate way. This is a secondary but perhaps more profound reason why motion is “incomplete.” Motion is causatively dependant on being-at-work.<sup>54</sup>

In such a framework, investigating and appreciating causes becomes as valuable as describing and measuring the result – the motion – of such causes. In the case of kinesiology, philosophic and historical inquiry into why and how (in what particular ways) humans locomote becomes vital. For such inquiry sheds light on the human values, meanings, perceptions, and desires that actually drive human locomotion.

This characterization in no way discounts the important role of the sciences in kinesiology. Scientific research will certainly impact how kinesiologists understand the human being as a cause of motion. Measurement and experimentation are invaluable tools for describing, examining, and testing

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<sup>54</sup> An alternative reading of the “inconsistency” between the *Physics* and *Metaphysics* is possible. Perhaps the foregoing explanation regarding the reconciliation of the differing accounts of *kinesis* focuses too much on consistency and thereby limits the conversation. Perhaps the *Metaphysics* are an attempt to build on the definition of *kinesis* found in the *Physics*. To worry about consistency is to miss the larger and more interesting point, as well as the larger and more interesting consequences. What are these points and consequences? By subordinating *kinesis* to *praxis*, Aristotle was attempting to contextualize motion within the larger framework of being-at-work. Human being is not “the motion or the act of walking but is something that moves or walks” (1049a35). Man is more than the motion in which he engages. Motion is not self sufficient. However, a limited reading of the *Metaphysics* could lead readers to the opposite conclusion. By insisting on the distinction between action and motion, Aristotle makes a mechanistic understanding of *kinesis* possible. In pushing for the importance of *praxis*, perhaps Aristotle actually encourages the divorce of the humanities and the sciences, by convincing some readers to believe that since “incomplete” *kinesis*, is set apart from action, motion can be effectively studied in isolation from human being-at-work.

our understanding of the means - that is the effect rather than the cause- of human locomotion in the world.

Of course scientific investigation, especially in concert with the humanities, rather than in opposition to the humanities, can discover important evidence regarding causes as well. This is particularly true when one considers the scientific insight that can be made into the other areas of Aristotle's richer definition of motion (i.e. growth, alteration, nutrition, etc.) which have a direct and constitutive role in sustaining the type of being who can consciously cause locomotion.<sup>55</sup> In the end, the why and the how, the cause and means, overlap and implicate one another.

Such scientific research into causes is hamstrung however if one tacitly endorses a materialistic philosophy (i.e. without acknowledging the philosophic nature of that endorsement) and if such philosophic endorsement encourages treating "causes" as merely the manifestation of underlying physical processes. In such a scenario, all other potential sources of causation are eliminated a priori, under the guise of "scientific legitimacy." Given the materialistic nature of such philosophic commitments it becomes *impossible* to consider evidence that intangibles act as causative agents.

It is important then to treat the cross-disciplinary nature of intellectual inquiry seriously, even if good reasons remain for the disciplinary structure and

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<sup>55</sup> Likewise such choice if it is to manifest itself in the world is necessarily dependent on the means of locomotion. Consequently, both scientific and humanistic inquiries are interrelated domains that must cooperate in the attempt to understand the nature of human beings.

specialization found in most kinesiology departments. This need to recognize the cross-pollination that occurs in most intellectual pursuits cuts both ways. Just as the biologist or physicist is not free to assume the materialistic worldview as a given without engaging the philosophic nature and validity of such an assertion, the philosopher is not free to ignore the insights into the human person created by scientific inquiry. Obviously, the impact of such scientific discovery on how one understands philosophy is profound.<sup>56</sup>

Sport Philosopher R. Scott Kretchmar makes this same point in his article “Jigsaw Puzzles and River Banks: Two Ways of Picturing Our Future” (2005). He uses rivers as a metaphor for the subject of kinesiology. The river metaphor does not reflect an assertion of kinesiology’s content but rather the field’s interdisciplinary, mutually dependent nature. Whether investigating humanistic “downstream” factors or scientific “upstream” factors, the best picture of the river comes when one does not discount the real power the whole river has on one’s own work at one’s own location on the riverbank.

“None of us, therefore, has the luxury of working on our own river-related problems as if they were independent or free standing. The water we study is colored by factors working from two different directions at the same time. When we use our disciplinary tools to measure what they are best at measuring, we invariably capture factors that have their home some distance from our own site. Our part of the river is, in a sense, forever affected by everyone else’s part of the river” (2005, p. 175).

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<sup>56</sup> This does not mean of course, that philosophers and scientists are always going to agree on how evidence should be interpreted. It does mean however that scientific insight does directly affect how one understands conscious human beings in the world.

Yet a scientific description of locomotion that is rigidly bound to a materialistic understanding of the phenomenon is blind to the rich causative power of the human being as the originator of meaningful locomotion in the world. A world of atoms and void cannot consider ideas and values as causative. To some scientists, unconcerned by the incongruity, or dogmatically committed to a materialistic philosophy that reduces the human person to an accidental bundle of atoms, this may not result in any sleepless nights. For others however, woken from their slumber by philosophic inquiry, a materialistic lullaby may not be enough to put them back to sleep.<sup>57</sup>

Given the preceding discussion, it appears that Aristotle's position can be made consistent and coherent. But that doesn't necessarily mean that Aristotle's position is correct. On the other hand, the success of modern physics does not necessarily entail a rejection of Aristotelian thinking on motion either. Beyond the potential conflict over metaphysical issues (such as causes), they are quite compatible. That is, one can appreciate and even accept Aristotle's central holistic thesis without a wholesale rejection of the power of modern physics and mathematics. As Sachs emphasizes, the successes of science are real and good. What is worth re-examining is how such success should be understood.

"But there are two kinds of support for the present-day physics that seem to lift it above dogmatism. One is a long history of experiment and successful technology, and the other is the greatest possible reliance on mathematics. These are both authorities that cannot be swayed by human

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<sup>57</sup> Assertions like those of scientist William P. Morgan (2001) regarding the importance of meaning and purpose in creating exercise adherence certainly suggest the slow but noticeable growth of this type of thinking.

preferences, and cannot lie. Their testimony, however, can be misunderstood, and can be incorporated into a picture of the world that fails in other ways" (1995, p. 10).

Are kinesiologists ready and willing - independent of whether they ultimately find merit in Aristotle's definition of *kinesis* - to admit and examine the role metaphysics plays in their understanding of the field? Are kinesiologists ready to take the agency of the human individual seriously? If the cost of the Cartesian assertion that motion is "nothing more than the action by which any body passes from one place to another" is the reduction of mankind to the status of an insentient machine, it would seem reasonable to doubt, in principle, the explanatory power of that description of motion.

One stumbling block to fully embracing this critique and thereby acknowledging the humanities in kinesiology, as Sachs pointed out, may be the supposedly superior epistemic value of mathematics. Following from a materialistic worldview, measurement, quantification, and data are sometimes raised up as either the sole source of knowledge or the only "objective" source of knowledge. But when such assertions are made, they inevitably ignore a whole host of problems and contradictions baked into the assertion. Measurement for instance is only as good as the precision with which it is carried out. But this raises the inevitable question, what is precision? When should scientists stop rounding Pi? How accurate do they need to be? The answers to such questions cannot be found in further measurement. Judgments are needed to get the empirical enterprise off the ground, and such judgments are not of a quantifiable



sort. This need for a qualitative judgment cannot be escaped by pragmatically insisting that “precision” is whatever works for a given problem; (i.e. you need only to be as precise as is required to get the job done). Such a pragmatic turn is still a reasoned judgment based on values that cannot be explained or justified solely on the grounds of further measurement. Recognition of the need for human judgment and skill in all areas of inquiry (as articulated by scientist and philosopher Michael Polanyi) will play a central role in chapter four.

Aristotle further critiques the sufficiency of mathematics, which, he argues, is in its very nature, if practiced in isolation from “natural bodies,” (Physics, 193b35) incapable of investigating causes or motion; except in the weaker mathematically describable sense of mechanical locomotion. The richness of the world, both qualitative and natural, is lost.

“[the mathematician] studies things after having stripped away everything perceptible, such as heaviness and lightness, hardness and its opposite, and also hotness and coldness and the other pairs of contrary perceptible attributes, and this leaves behind only what is of some amount and continuous, belonging to some things in one dimension, some in two, and others in three, and he studies the attributes that belong to these insofar as they are of some amount and continuous, and in no other respect” (Metaphysics, 1061a30-35).

Mathematics is a tool (a vital tool) to help describe reality, but is incapable fully capturing reality. This does not mean that mathematics is false, or “bad,” or unimportant. It simply means that assertions regarding the self-sufficiency or epistemic priority of data and measurement are not in any way self-evident. Such assertions are a function of philosophic commitments, and these philosophic

commitments bear consequences. So being, such assertions should not be made blindly. As Sachs insists, such questions *require* philosophic reflection. “Only then can we rationally and responsibly decide whether to adopt [such] opinions as our own” (1995, p. 11).

If mathematics and the measurements that mathematics makes possible cannot be relied on as the *sole* arbiter of knowledge claims regarding the natural world, what else can be done? One simple step would be to take Aristotle seriously and apply his methodological habits to one’s experience in the world. Look and see if being-at-work is present in the world. Should such reflection and observation bear fruit, it would become very hard not to raise serious questions about the current assumption among many within kinesiology that materialism is the only intellectually defensible worldview.

Certainly being-at-work seems to be a particularly rich way to describe how one encounters living things in the world, particularly human beings. Human beings do seem to be self-maintaining wholes; that is beings-at-work-staying-themselves. Metabolism, growth, locomotion, even contemplation and play and games, may, upon observation, fit very well with the Aristotelian assertion that they are part of what a human being “keeps on being in order to be at all” (Metaphysics, 1028b34).

Human motion is not merely locomotion from place to place, nor blind mechanical necessity, but deserves rather, a deeper ontological status. To grow, to mature, to run, jump, and kick are all part of what it means to be a human

being. They are part of human-being-at-work-staying-itself. While kinesiology is free to focus on change of place (locomotion), such study should not lose sight of the larger (human & kinetic) context.

Locomotion is but one type of *kinesis* present in the world, and is wrapped up in our understanding of the nature of human beings. Kinesiology must then take these two principles into account. On a micro scale, *kinesis* is richer than mere locomotion. On a macro scale, *kinesis*, serves and informs our understanding of a larger principles; human being(s) and nature itself. To pursue kinesiology ignorant of either harms our understanding of human movement.

Accordingly, *kinesis* cannot be properly understood if it is seen as simply a problem of geometry, math, and physics. Human locomotion is always fundamentally informed by perceptions, intentions, and values, (On the Soul, 433a15-20) as well as by biology and chemistry (On the Soul, 413a3-5). Human motion is a function of human *being*, and is therefore always contextualized; it is, as we have seen, a matter of places not mere space<sup>58</sup> (Anderson N. , 2004). Hence motion always involves the whole person.

A compartmentalized understanding of motion is severely limited. Aristotle's definition of *kinesis* offers advantages for improving both the theory and practice of kinesiology. These Aristotelian insights into *kinesis* lead directly into the next two chapters. First, in chapter three I will discuss the relationship of

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<sup>58</sup> Such a claim has support in the scientific literature. Newell (2007) notes almost in passing that "All movement is conducted in a context...we know from the growing impact of the study of motor development that even the movements of neonates and infants are context dependent" (p. 9).

*kinesis* to *energeia* (being-at-work) and the implications of such thinking on our understanding of the human person. Then in chapter four I will examine how a reshaped understanding of *kinesis* affects our understanding of human knowledge.

*Kinesis* is a complete being-at-work, but in so being it is incomplete; that is, *kinesis* is *transitional* in terms of its expression, as well as *subordinate* in terms of its self-sufficiency. Motion is natural and intimately tied to organisms. Motion is in human terms always the expression a particular human being. Human *kinesis* is subordinate to human being-at-work. Human movement is not the mere mechanism of random atomic collisions, but the expression of particular human potencies at work in the world.<sup>59</sup> To understand motion we ultimately need to understand the “source of motion.” In the case of kinesiology this means we need to investigate, understand, and begin to articulate what it means to be a human being. Here too Aristotle bears fruit.

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<sup>59</sup> This claim should not be read dualistically. The point is not to reject matter and elevate “mind”. Instead it is an attempt to reinforce the Aristotelian concept of being-at-work by insisting that material and form are integrated components of human beings. In other words, the criticism is not directed at material or matter as such but rather at the reductive claim that material is self-sufficient for describing and understanding human motion.

### Chapter 3- *Kinesis* and the Nature of the Human Person

In the previous chapter, it was argued that *kinesis*, the being-at-work-staying-itself of potencies was incomplete in two senses. Neither sense of incompleteness however was related to the more traditional criticisms that allege that Aristotle's definition of motion is incoherent. The first sense that motion was regarded as incomplete was related to the transitory nature of motion. Motion as a being-at-work is the expression of potencies, and therefore motion is, *in that expression*, incomplete. For example, the growth of a child as it moves into adulthood is *a transition* from immaturity to maturity. The being-at-work of the potency as potency for growth is an active whole, but is transitional in the *movement* from childhood to adulthood. Hence, for motion to remain what it is, it must be transitional, or incomplete. Hopefully, it is clearer now, after such an intense investigation of Aristotle's thinking, that insofar as motion is at work staying itself as motion, it is complete, but insofar as motion is coextensive with change (Sachs, 1995) it is incomplete.

A second and arguably more profound way that *kinesis* was said to be incomplete was also raised however. The second way that *kinesis* was "incomplete," was due to *kinesis* being subordinate to *being-at-work*. That is, motion, as the expression of potencies, is always a function of a larger being-at-

work that is the source of those potencies. Motion has a cause.<sup>60</sup> The child's potency for growth is a function of *human* being-at-work, and always manifests itself in a *particular* child, born of other particular human beings, who as fully grown adults have the potency for human reproduction.

Following from this reasoning, it was argued that any full understanding of *kinesis* must understand the larger *being-at-work*, which it serves. *Kinesis* is in an important sense subordinate to *energeia* (Metaphysics, 1049b6-7). As Aristotle points out in the *Metaphysics*, an animal walks in service of being a walking thing, rather than being a walking thing in service of walking.

“For those things to which something is attributed, that is, underlying things, differ in this way: by being or not being a *this*. For example, a human being is something that underlies its attributes, and is both a body and a soul, and the attribute is cultivated or pale (and when cultivation has come to be in it, it is said to be not cultivation but cultivated, and human being is not paleness but pale, and is not motion or the act of walking but is something that moves or walks)” (1049a28-34).

To completely understand the locomotion of walking, one must also study the nature of the whole; the walking thing. Aristotle insists in *On the Soul* (2004), that if we're to truly explain the walking thing, we need an account of more than the mechanics of motion. We need an account of *self*-motion and the perception that makes such self-motion possible (413a20-25). To understand human motion and locomotion we must understand the whole human person. Kinesiologists

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<sup>60</sup> This is most apparent in living things, but Aristotle also argues that the cosmos as a whole is the cause of non-organic motions.

need to investigate more than the biomechanical, chemical, or physiological properties of human movement.

It is true of course, that understanding the person is certainly enriched by a scientific analysis of (to stay consistent with our example) walking. Such analysis no doubt informs and ultimately deepens our understanding of human being-at-work. It is imperative to understand both the tangibles of experimental science and intangibles such as ethics, because both provide insight into the nature of the human person. It is also imperative, however, to avoid becoming so enamored of the power of scientific inquiry that one confuses and reduces the human being (a walking thing), to a description of the human attribute (the walking as such).<sup>61</sup>

Yet, what is a human being? Are humans, as a popular musician recently opined in one of his songs, a soul “stranded in some skin and bones” (Bono, 2004)? Are humans a complex but wholly material body or are they best described as a mind plus a body? Obviously, the answer to such questions

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<sup>61</sup> “The principal result of Aristotle's inquiry into the logical categories of being is, I think, the claim that the thinghood of things in the world is never reducible in our speech to any combination of qualities, quantities, relations, actions, and so on: that *ousia* or thinghood must be a separate category. What happens when I try to articulate the being of a thing such as an Irish setter? I define it as a dog with certain properties. But what then is a dog? It is an animal with certain properties, and an animal is an organism with certain properties, and an organism is a thing with the property life. At each level I meet, as dog, animal, organism, what Aristotle calls secondary *ousia* or secondary thinghood. I set out to give an account of what makes a certain collection of properties cohere as a certain thing, and I keep separating off some of them and telling you that the rest cohere as a whole. At my last step, when I say that an organism is a living *thing*, the problem of secondary thinghood is present in its nakedness. Our speech, no matter how scientific, must always leave the question of the hanging-together of things as a question” (Sachs, 2006).

regarding the nature of human being will deeply influence how kinesiology understands itself.

If, for example, humanity is merely an accidental collection of atoms bound together by physical and chemical laws, then expanding our understanding of the walking thing only requires further scientific investigation of these more fundamental laws and particles. On the other hand if such a materialistic understanding fails to adequately describe or predict human behavior then a broader investigation into human beings is needed.<sup>62</sup>

To begin to understand Aristotle's answer to these questions, it is imperative to review and evaluate Aristotle's notion of the nature of living things (including human beings) found primarily in *On the Soul*. This discussion will flesh out the integrated nature of *being-at-work* and *kinesis*, and in so doing will further fortify the proposition that one must understand the whole human to understand human motion. The human being cannot be understood in purely reductive material terms. The necessity of intangibles (such as ethics, perception, and desire) in understanding motion, as well as the necessity of motion in understanding human beings makes a materialistic account untenable. Following this discussion of Aristotle's holistic understanding of human nature, the chapter will then close by suggesting that Aristotle's definition of motion as well as his understanding of the mind/body problem implies the need for a radical

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<sup>62</sup> I am fully convinced that the defense of the humanities - both within and without of Kinesiology- hinges on the defeat of materialistic ontologies.



reformation of the common understandings of the nature of the human person in the discipline of kinesiology.

Building on the work of both Aristotle and Brague (1990) I will argue that a proper understanding of motion must reflect a shift in our understanding of the question of “what is being?” Once one fully understands the concept of *entelecheia*, (being-at-work-staying-itself), and appreciates the role *entelecheia* has in understanding motion and human beings, the question shifts from “what is being” to “how is being?” Human being is a matter of how we are.<sup>63</sup> Human being is human *activity* (in the sense of self-maintenance or wholeness, rather than “busyness”). Human being is a function of how, not what, and therefore the power of materialistic explanations is limited, because such explanations necessarily reduce the human person to a bundle of “whats”. Nevertheless, even after granting the limitations of materialism outlined in this dissertation, it is important that an ontology that takes consciousness and the immaterial seriously avoid falling into the equally problematic domain of Cartesian mind/body dualism.<sup>64</sup>

Human being is not independent of bodies, and is therefore not independent of material. Neither is human being independent of ideas, values,

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<sup>63</sup> Material is certainly integral to such presentation even if a materialistic account itself is insufficient. We are our bodies, but we are not *just* bodies.

<sup>64</sup> Dualism cannot explain the relationship of the mind to the body. This in turn leads to treating each part of the person independently. Inevitably mind is given priority over body, as the mind seems to be the home of identity and personality. Given these dualistic assumptions, kinesiology immediately becomes a secondary discipline because it is related with body rather than mind. It is as a consequence of this unwelcome outcome that the discipline of kinesiology has often tried to make itself more “theoretical”, in an attempt to gain academic respect.

and beliefs. The mistake of the dualists is not that they take consciousness seriously, but that they take it too seriously. The mistake of the materialists is not that they take the material nature of human beings seriously, but that they take it too seriously. Each school of thought distorts a proper understanding of the person, by unjustifiably elevating a part above the whole.

If both materialism and dualism fall short of an accurate description of human beings, how should the human person be understood? How does Aristotle help clarify the nature of human beings? According to renowned physicist and theologian Stanley L. Jaki (1983), the modern era has been plagued by a pair of diametrical reductionistic errors regarding the nature of man. Man, has been seen either as, (following Descartes) an angel, that is a disembodied rational mind, or (following Rousseau) as an ape, that is an animalistic brute. But man, Jaki argues, is neither. Even if both assertions contain grains of truth. Both conceptions, in over-emphasizing and isolating one aspect of humanity, lose sight of the whole being. Rather, Jaki insists, man is a complex and unconquerable “unity of body and soul” (1983, p. 7).

Even after setting aside the fact that some in the modern world are uncomfortable with the word “soul”, fundamental questions remain regarding the assertion that human beings are a unity of such apparently disparate elements. For if soul - or put in a more neutral, less contentious, and arguably less theological frame, consciousness - is to be taken seriously, how in the world

does it relate to the body? What do Jaki, and in turn Aristotle, mean when they argue that the soul and body are *unified*?<sup>65</sup>

Aristotle's answer, found in *On the Soul*, much like his *Ethics* (2002), follows a middle path, "that deepens the discussion of the topic" (Sachs, 2004, p. 20). Although Aristotle's use of the words "body" and "soul" would appear to some to confine him within a dualistic framework regarding the nature of the human person, a close inspection of his work reveals a vibrant and holistic understanding of human beings.<sup>66</sup>

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<sup>65</sup> Jaki argues for an anti-reductionist Thomistic account of man. Aquinas was, of course, an Aristotelian. "Nothing is more difficult than to speak of the brain-mind or mind-body relationship. It is a mysterious coin with two luminous sides. The only way to handle it is to follow the advice once given about a tax coin and render both mind and body their respective dues. In a sense the Thomistic doctrine of the soul as the form of the body states precisely this. It is a doctrine respecting facts, refractory though they may be to the impatience of reductionism" (p. 19).

<sup>66</sup> Some would argue that the use of two words, "soul" and "body", implies a Cartesian substance dualism where soul and body are independent of each other; or where the mind "pilots" the body, (it is worth noting that Aristotle uses this precise example to scorn the notion that the soul is independent of the body). Dualism, as such, when used by philosophers, is usually, though not always, meant to mean Cartesian dualism. Some Aristotelians would describe his position as "dualistic", because it gives credence to both material and immaterial. Holism however if it is to avoid descending into monism – and thereby I would argue, some form of materialism or idealism - must give credence (though not independence) to parts. Aristotle, as we will see, feels quite strongly that a proper ontology must pay respect to the distinction between soul and body without granting them independence.

Terminology then can be confusing; as different proponents of different ontologies can use the same word to mean different things. What matters at the end of the day is not so much the terminology – though consistency is always advantageous- but rather the underlying philosophical commitments the terminology represents. Jaki (1983) for instance uses the term "dualism" to describe his own position, but scorns Cartesianism, and embraces Thomism/Aristotelianism (pp. 19, 64).

Some further clarification of my own position would then seem necessary. When I use the term holism I am not implying monism. A whole, by definition, requires parts. But these parts are always subordinate to, and only recognizable in reference to, the whole human person. Thus mind/soul and body are not independent of each other, but are rather integrated constituents of the person, which are both always at work in every type of human activity. There is not "physical activity" or "mental activity" as such. If one separates the parts one destroy the person. Such thinking could be seen from a Christian theological perspective as a profound way to understand death and resurrection. When I use the term dualism, I am envisioning a robust Cartesian ontology that elevates and separates the mind from the body, and thereby prioritizes mental activity as superior to physical activity.

Aristotle begins *On the Soul*, by asking a fundamental question. What method(s) of inquiry best account for the being of living things? “Which of these is the one who studies nature? Is it the one concerned with the material who ignores the meaning or the one concerned with the meaning alone? Or is it rather the one who is concerned with what arises out of both” (403b7-9)? The central nature of this question should, by this point, be readily apparent. Can living things be accounted for on material grounds alone? Aristotle’s answer is no.

“So we say, taking this as a starting point for the inquiry, that what is ensouled is distinguished from what is soulless by living. But living is meant in more than one way, and if any one alone of the following is present in something we say it is alive: intellect, perception, moving and stopping with respect to place, and the motion that results from nourishment, that is, wasting away as well as growing” (413a20-25).

For Aristotle animal life distinguishes itself primarily on two phenomena. Both of which are intimately tied to *kinesis*; the potency of animal life for perception and the potency of animal life for self-motion (self-directed locomotion).<sup>67</sup> Perception makes the animal capable of interacting with its environment. Perception makes desire possible. Desire and choice make self-directed locomotion possible and purposeful. Locomotion is, as has been previously discussed, one of the species of *kinesis* for Aristotle.

The existence of perception is problematic for materialists because any mechanistic description of perception fails to explain how the perceptive powers of living things, such as sight, differ from non-living things with the same

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<sup>67</sup> “Now that which is ensouled seems to differ from that which is without a soul in two ways most of all: in motion and in sensing.”(On the Soul, 403b26-28).

mechanism, such as a camera. How is it that the mechanism of the eye produces *sight*, rather than a mere photo-chemical impression on the rods and cones of the eye? This kind of materialistic explanation, even if it were convincing, is self-defeating. The assertion that perception is merely a mechanical/material process *requires* perception by the observer of the supposedly mechanical process.<sup>68</sup> As Michael Polanyi insists, “Biology is life reflecting on itself, and the findings of biology must prove consistent with the claims made by biology for its own findings” (1962, p. 347). Furthermore, as Aristotle points out, living things are capable of distinguishing between different perceptions that are incapable of material contact.

“So each sense is directed to the perceptible thing that is its object, is present in the sense organ insofar as it is a sense organ, and discriminates the distinctions that belong to the perceptible thing that is its object, sight, say, discriminating white and black, but taste sweet and bitter, and this is the same way with the other senses. But since we also distinguish white from sweet, and each perceptible thing from every other, then there is also something by which we perceive that they are different. And this is necessarily perception, since they are perceptible things. This also makes it clear that the flesh is not the final sense organ, since then the thing that distinguishes perceptible attributes would have to be in contact with them in order to distinguish them” (On the Soul, 426b8-18).

Self-motion (locomotion) presents further problems for the materialistic account of human beings. How should the ability of animals to move from place to place and to bring themselves to rest be explained? The pre-Socratic philosopher Democritus, himself a materialist, asserted that motion was a

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<sup>68</sup> “The truth of observation and experiment is that it is rooted in perception, and it cannot then erase its own source by concluding that the thing perceived is not a thing perceived” (Sachs, Introduction, 2004, p. 15).

function of “indivisible spheres” (atoms) whose constant activity “drag the whole body with them and set it in motion” (On the Soul, 406b22). Aristotle counters Democritus by pointing out that such a description cannot account for rest, and that self-motion requires perception and choice (On the Soul, 406b-23-25). Locomotion that requires perception, and allows for rest cannot be merely a function of material. Living things are more than bodies, they are organized self-maintaining wholes.<sup>69</sup> Such organization, though it requires material, is not reducible to material. This organization is a being-at-work-staying-itself, and that is exactly what Aristotle says the soul is. The soul is the being-at-work of, or more traditionally if inadequately put, the form of the body (On the Soul, 412a20).<sup>70</sup>

A more complete picture of what Aristotle is suggesting can be seen in several analogies he draws on after proposing his definition of the soul. These analogies are used to show how it is that the soul and body make up the living thing as a unified whole rather than a heterogeneous combination of parts. The first analogy in *On the Soul*, regards the co-dependence of the wax and the shape that pressed it (412b8), while the second regards the material axe and the purpose for which it was made, cutting (412b15). Both such analogies are incomplete however because they do not entail the dynamism of the natural

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<sup>69</sup> “Living comes about just where material bodies cease to explain anything, where they are organized into active wholes” (Sachs, 2004, p. 19).

<sup>70</sup> “So if one needs to say what is common to every soul, it would be that it is a being-at-work-staying-itself of the first kind of natural, organized body” (On the Soul, 412b5-6).

being-at-work-staying-itself found in living things which “have a source of motion and rest in [themselves]” (412b17). For this reason, the final analogy compares a part of such living things, the eye, to that of the whole animal.

“For if the eye were an animal, the soul of it would be its sight, since this is the thinghood [*ousia*] of an eye as it is disclosed in speech (and the eye is the material of sight); if its sight were left out it would no longer be an eye, except ambiguously, in the same way as a stone eye or a painted one... But just as the eyeball and the power of sight are the eye, so here the soul and body are the living thing” (412b18-22, 413a15).

The living thing cannot just be, (nor primarily be) the soul. Nor can the living thing be just the body, nor a conglomeration<sup>71</sup> of the two (407b). As Sachs comments, “It is not just that in them [living things] body and soul are tightly bound into a whole, but that in them body extends to mean ensouled body, and soul draws body up to that fullness of meaning” (2004, p. 23). It is this wholeness that makes dualistic descriptions incomplete even though they take “soul” seriously. Likewise, materialistic descriptions that say a person is a conglomeration of purely material elements, (chemicals, atoms, etc.) fails to see the wholeness of human beings, or takes the wholeness of human beings for granted.<sup>72</sup> Aristotle, uses an additional analogy in the *Metaphysics* - that of the syllable - to make his point. He criticizes these arguments for conglomeration which he likens to a description of “heaps” rather than wholes.

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<sup>71</sup> By conglomeration I mean “independent parts stuck together.”

<sup>72</sup> “Without material and motion there is not life or soul, but without the nonmaterial and unmoving being-at-work of the soul there is no world at all that we would recognize” (Sachs, 2004, p. 19). “A complete physical and chemical topography of a frog would tell us nothing about it as a frog, unless we knew it previously *as a frog*” (Polanyi, 1962, p. 342).

“But then there is what is composed of something in such a way that the whole is one, in the manner not of a heap but of a syllable – and the syllable is not the letters, nor are B plus A the same as the syllable BA, any more than flesh is fire plus earth (For when they are decomposed, the wholes, such as flesh or a syllable, no longer are, but the letters, or the fire and earth, are); therefore there is something that is the syllable, not only the letters, the vowel and consonant, but also something else, and the flesh is not only fire and earth, or the hot and the cold, but also something else” (1041b12-18).<sup>73</sup>

Aristotle then contends further that this “something else” must be immaterial (1041b20-30). For a material explanation, such as, B+A+ “X” succumbs to the same problem. What is it that is holding B+A+ “X” together? How are B, A, and “X” unified? Adding another material element only deepens the regress even further. Despite the urge toward explanatory simplification, the human being, like the syllable, is more than a summation of its parts.

As Sachs declares:

“The thinghood of the whole thing takes precedence over all the parts, and is neither among them nor the mere sum of them. The whole appropriates and alters each of the parts, so that I cannot pronounce any letter without having in mind the syllable it must be shaped to fit. Only in the being-at-work of the whole is the part truly a part, so that the very nature of the part demands the presence of something that is not a part” (2004, p. 22).

Human beings are best described as complex, “active,” self-maintaining wholes. Aristotle bridges the gap between *ousia* (being) and *kinesis* (motion) by using *energeia/entelecheia* (being-at-work) to re-characterize the question “what is

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<sup>73</sup> Scientists too make statements, even if inadvertently, that support Aristotle’s claim. “The cell’s macromolecular machines contain dozens or even hundreds of components. But unlike man-made machines, which are built on assembly lines, these cellular machines assemble spontaneously from their protein and nucleic-acid components. It is as though cars could be manufactured by merely tumbling their parts onto the factory floor” (Woodson, 2005, p. 556).



being?" He shifts being from a question of "what?" to a question of "how?" Being is not static matter, nor is it pure eternal form, but rather *entelecheia* (being-at-work-staying-itself), a "dynamic equilibrium" rather than a static substance, where "the highest level of material and the form are one and the same thing" (Metaphysics, 1045b18). It is in being-at-work, that human beings *remain* themselves. Our human identity is a matter of being, not a matter of sheer substance(s).

Remi Brague, discusses the importance of this shift from "what?" to "how?" in his article, "Aristotle's Definition of Motion and its Ontological Implications" (1990). Brague argues that since at least the time of Parmenides, there has been an over-riding temptation to define being with the static and inert. Motion either "has been" or "will be"; and consequently it is argued, "that which is [presently]...can only be immobile" (p. 3).

Clearly, Aristotle's contention in the *Physics* that motion can be defined and has being is no small matter. "The consequence of this ontological rehabilitation of motion is an undisputed fact, which I mention here only as a reminder: it is Aristotle's concern for the elaboration of a *knowledge* of the sensible" (Brague, 1990, p. 4). We cannot have knowledge of the sensible, natural world - which is obviously in motion- if motion has no being. If motion has no being, the natural world becomes, as Parmenides asserted, "The Way of Seeming." The stakes regarding our understanding of motion are high. Brague

continues, “Therefore, if that which is in motion, or, its fundamental feature, motion, is not, then there is no knowledge of nature” (p. 4).

Being is best understood by observing the way things present themselves. And this is what the idea of being-at-work-staying-itself is meant to describe. The self-maintaining activity by which human being perpetuates itself in the world. It is important to emphasize and reiterate as Brague does, that this activity is a matter of wholeness rather than frenetic “busyness.” One of the ways that living things present themselves to the world is through their capacity for rest.<sup>74</sup>

“Consequently, we need a concept of *energeia* wide enough to include both the mobile and the immobile modes of *presenting oneself*. It does happen that things present themselves as what they are through the exercise of an activity, but it may also happen that this presentation does not require such an exercise” (Brague, 1990, p. 9).

Similarly, it is a mistake to limit the full range of ways that this being-at-work manifests itself in the world. This activity runs the whole empirical gamut; from the quantifiable to the phenomenological, from metabolism to motivation, meaning, and values. It is in such a complex myriad of activity that humans remain what they are. Brague characterizes this point in a unique way. He points out that Aristotle’s conception expands our understanding of being beyond “sight” to *logos*, by which Brague means our capacity to “grasp the possible as

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<sup>74</sup> Interestingly this suggests that a proper conception of kinesiology must study both motion and rest. Or put another way, kinesiology cannot presume that motion is independent of the being that initiates the motion. “Rest”, in sporting situations, can in fact be a function of skill. Skill is as much not moving as it is moving. In other words, skill in moving is not aimless flailing but rather a “Goldilocks” movement that is just-right.

such” (1990, p. 15). The “how of things” is present in more than the material we see.<sup>75</sup>

*Kinesis* is fundamental to the nature of human being. *Kinesis* relies on both tangibles and intangibles. Human beings locomote because they perceive, value, yearn, and desire. But they also move because they taste, feel, consume, and burn (calories). Locomotion, or movement from place to place, is possible only by being integrated into Aristotle’s richer sense of motion discussed in chapter two. Human beings grow. Human beings assimilate, and digest. Human beings learn, perceive, and mature. Human beings value and desire. Self-directed locomotion would not make sense outside of this larger context, for there would be no *self* to *direct* the movement. Observation, as well as reflection on our experience, reveals all of these aspects of humanity and human *kinesis* ambiguously at work at the same time.<sup>76</sup> In everything we do we are embodied. In everything we do, our souls are in plain view.<sup>77</sup>

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<sup>75</sup> “But there is one kind of material that is intelligible and another kind that is perceptible, and one part of the statement is always material and the other part being-at-work...” (Metaphysics, 1045a35).

<sup>76</sup> Lactic acid build up actually makes sport more enjoyable for many. The *idea* of winning or losing, can put a knot in your stomach. The smell of the grass and the smell of possibility (dramatic tension, creative potential, etc.) as Anderson calls it (2001), are intertwined aspects of the human experience of baseball.

<sup>77</sup> As mentioned previously, “consciousness” as a term, would work here as well, though it doesn’t suggest the self-maintaining wholeness found in living beings in the same way that Aristotle’s definition of soul does. Irrespective of the label, it is of course true that sometimes things in plain view go unnoticed. “The truth knocks on the door and you say, ‘Go away I am looking for the truth,’ and so it goes away” (Pirsig, 1984, p. 5).

Such a statement may at first reading seem to grate upon the ears. How can we see souls?<sup>78</sup> How can something as amorphous as consciousness be the subject of serious academic inquiry? But as much as the idea may grate, it is important for kinesiologists to take the assertion seriously. It is an assertion that demands the recognition of the phenomena; a demand that kinesiologists acknowledge that the soul – in the Aristotelian sense – “is.”<sup>79</sup>

Such an acknowledgement is independent of answering the why or how of the soul. The recognition of the soul does not demand a religious explanation; though such explanations should be considered reasonable in principle, if not always in fact. That does not mean that there are not better or worse answers, or even a right answer regarding the implications of the presence of soul in the world. Aristotle himself felt the evidence suggested particular answers. For the general purposes of kinesiology however, the point being made is that agnostic and even atheistic philosophies are compatible with recognition of the soul. Only

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<sup>78</sup> The materialist is of course skeptical because what is seen is not inert, but the religiously devout may be made just as uneasy by the assertion. For some, the idea that the soul is visible seems to threaten their sense of the soul’s immortality by threatening its ghostly character. Aristotle’s type of thinking is not foreign to Christianity however, as anyone who has read Aquinas or even the Gospels can attest. Jesus is constantly challenging his followers to see the fullness of what is presented to them, as well as the fullness of the world around them. See for example, Luke 12:54-56, Matthew 13, John 9, and Luke 4:1-4. It does not follow however that Aristotle’s philosophy should be simplistically glossed over as proto-Christian.

<sup>79</sup> “For no events occurring according to the known laws of physics or chemistry can be conscious. Alchemists used to attribute conscious desires to the mating of acids and bases, but chemistry accounts for such processes without any such imputation. The ‘action’ of a reagent is no action, for it cannot fail; hydrochloric acid will never dissolve platinum by mistake. Nor can self-regulating machines operating in accordance with the known laws of physics or chemistry represent human beings. For such machines are insentient automata and men are not insentient automata... We speak of the thoughts of Shakespeare had while writing his plays and not of the thoughts of hydrochloric acid dissolving zinc, because men think and acids don’t. It is obvious, therefore, that the rise of man can be accounted for only by other principles than those known today to physics or chemistry. If this be vitalism, then vitalism is mere common sense, which can be ignored only by a truculently bigoted mechanistic outlook” (Polanyi, 1962, p. 390).

the dogmatic materialist should see an in-principle incompatibly. The presence of the soul - that is the being-at-work-staying itself of a natural organized body - in the world is observable. Observation is itself an instantiation of the soul. The precise explanation of the meaning of that observation (whether natural or supernatural) is up for debate.

If Aristotle's definition of the soul makes sense, then it should follow that souls will reveal themselves - to those who pay attention - *in the activity (the life) of human beings* because the body and soul are not independent entities. The body as such is not "a static arrangement, but a being-at-work of organized material" (Sachs, 2001, p. 19). Human beings are more than machines; therefore it should not surprise us that upon reflection, we must admit that when we look at other people *we see more than machinery*.

Philosopher Joseph Pieper argues that a holistic (Thomistic)<sup>80</sup> understanding of the human person implies, "not only that the human being is bodily, [rather than pure spirit] but that the soul itself is also bodily" (1998, p. 93). Given our contemporary habits toward dualism or materialism, such thinking, Pieper asserts, is not "easily digested," (1998, p. 93) but it should not therefore be ignored. Indigestion is not, after all, always a sign of the poor nutritional quality of that which is consumed. Sometimes indigestion is a matter

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<sup>80</sup> Pieper (1998, p. 93) quotes Aquinas regarding man's nature. "The soul that is united to the body is more like God than the soul that has been separated from its body because the former more perfectly possesses its nature."

of not putting the proper amount of time, energy and attention into the act of consumption.

Perhaps the “philosophical-indigestion” can be alleviated by reviewing the argument that I, following Aristotle, have been advancing. Being is more than material. Materialism fails to account for consciousness and self-organization. Materialism also fails to give proper credence to the nature and depth of *kinesis* in the world. Dualistic descriptions, while taking consciousness seriously, fail as well, because by prioritizing the mind, they do not succeed in adequately explaining the reality and importance of our *being in the world*.

Both descriptions cause serious problems for kinesiology. Implicit in both descriptions of the nature of people is the urge to understand things by fixing, or nailing down what something is, by atomizing it, by making it inert. The same urge manifests itself regarding motion. This, as we have seen, creates problems for the possibility of motion. A fixed entity is not a moving entity. If being is inertness, then motion has no substantial being. As Parmenides pointed out, how can something transitory exist? How can non-being be? If motion must be static to have being, then clearly motion is an illusion.

The answer of course, as I have been arguing, is to shift our attention to *entelecheia*, and see that being is being-at-work-staying-itself. Human identity is real, but is a function of being-at-work. Being is not inertness but rather wholeness. A wholeness expressed in the *union* of soul and body.

As Aristotle insists, “being-at-work is something that happens, not something

that is present like a possession” (Nichomachean Ethics, 1169b30). The wholeness encountered in living things is made possible through change. Change manifests itself as the expression of the potencies of a particular being-at-work. *Kinesis* is caused by beings-at-work. In turn, *kinesis* makes possible the being-at-work that directs it.<sup>81</sup>

Such an understanding values reductive insights as well as dissection, but rejects them as ultimate explanatory principles because human *being* is not merely substance or material.<sup>82</sup> Human *ousia* (being) is intimately connected to *energeia* (being-at-work), and therefore *kinesis*.<sup>83</sup> *Kinesis* as we have seen, even when limited to locomotion, cannot be understood on material grounds alone; at least not without destroying the very possibility of consciousness; by which understanding is achieved and upon which the inquiry into motion is initiated.

Kinesiologists must learn to be comfortable in the presence of soul. If we return to Kretchmar’s metaphor for kinesiology, that of “Riverbanks,” this idea though in different language, is reaffirmed. Aristotle’s understanding of *kinesis* as well as his ontology of human beings supports the claim that kinesiology must look both upstream and downstream for insight. “As we study it, the water

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<sup>81</sup> “For anything from plants on up, that grows into a mature form, and maintains an organized body by appropriating material from its surroundings, to be at all is to keep on being what it is by being and staying at work; the cessation of such activity is death, and a dead oak tree, though it is still something is no longer an oak tree. It’s being was its life” (Sachs, 2004, p. 9).

<sup>82</sup> Likewise it rejects compartmentalized (i.e. dualistic) understandings of the human person, on the grounds that being-at-work is always embodied. That is, human being is not independent of material.

<sup>83</sup> Maxine Sheets-Johnstone makes this point quite powerfully her book *The Primacy of Movement* (1999). “We come straightaway moving into the world; we are precisely not *stillborn*” (p.136).

[kinesiology] moves on from gene, to anatomy, to physiology, to behavior, to culture, to subjective states, to ideal living – as we observe it when we see a well-adjusted child captured by joy!” (Kretchmar, 2005, p. 176).

Aristotle’s understanding of *kinesis* demands that the oft-ignored humanities, are paid more than lip service by kinesiology. No coherent account of the locomotion of living things can be given that does not rely on the need for and reality of, perception, desire, and choice. Understanding perception, desire, and choice is not found in the realm of “academic distance”, and abstraction, but rather passionate meaningful specificity. Joy captures a child through the experience of connecting on the “sweet part of the bat”, or through “the rush of plummeting down a waterslide.” A comprehensive understanding of motion must engage the role of emotion, ethics, and values, as well as the principles of motor control or exercise physiology, for both are bound up in the activity, that is the being-at-work of human beings. It is human beings who move not mere human bodies. Kinesiology as a field of *inquiry* into human locomotion is ultimately incoherent when emptied of the specific, meaningful, and culturally resonant movement forms, such as games, play, and sport, for it is such *human* movement that *captures* joy.

Games play and sport are certainly not the only culturally resonant forms of human movement, and insofar as others exist (such as dance) they should be welcomed at the table. Additionally it is worth noting that those who are arguing in favor of abstraction are not, or at least do not seem to be arguing for a wider



array of culturally meaningful activities, but rather a more distant, stoic, disimpassioned engagement with “motion” on the grounds that such an engagement can withstand academic scrutiny.

I am convinced, given such caveats, that the assertion of a vigorous role for games, play and sport in kinesiology is contentious only insofar as kinesiologists divorce –in the name of respectability- their intellectual commitments from the practice of their daily lives. Human beings are creatures of more than material necessity. Human beings are creatures of more than material motivation. In fact, I believe such a claim does not offend anyone’s intuition, nor does it misrepresent human behavior; which is ubiquitously committed to the joys of games, play and sport. Instead it offends ideology by exposing the limitations of certain explanatory principles. The offense is a function of what Jaki calls, “intellectual impatience” (1983, p. 19). The phenomena are squelched or ignored in favor of a “clear and distinct” explanation. Material reduction is satisfying because it brings clarity even if often fails to bring truth.

A vigorous commitment to the centrality - though not exclusivity - of games, play, and sport in kinesiology offends many kinesiologists not because it is untrue, but rather because it threatens, they believe, the field’s ability to assert and maintain its academic credentials. Games, play, and sport, are thought non-theoretical, not-intellectual (i.e. physical), non-useful, and unrefined (Kretchmar, 1996). They are therefore not worthy of being considered academic realms of

knowledge.<sup>84</sup> Yet if Aristotle's conception of the person is correct, the soul is present not only in "intellectual" activity but in all human activity.

We have seen, through our discussion of Aristotle, the epistemic implications of his understanding of *kinesis* as well. Whether politically advantageous or not, kinesiology *needs* knowledge of more than the material and the measurable to see the full and coherent picture of *human* movement.

A continued push towards a materialistic self-understanding will only bring ignorance.<sup>85</sup> But even if such comprehensive or holistic inquiry is necessary, is such knowledge, insofar as it includes the intangible, reliable?

Kinesiology continues to distance itself from the humanities because far too many kinesiologists have been convinced that the humanities are epistemologically inferior to the sciences. Intangibles such as ethics seem to lack the sufficient evidentiary weight to help justify an already precariously positioned field to the rest of the academy. Is it not the case that scientific inquiry reveals objective truths in a way that the humanities cannot? Is it not the case that measurement is an impersonal and verifiable path to knowledge that avoids the pitfalls, uncertainty, and subjectivity of the humanities? Is it not then a

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<sup>84</sup> This is of course the function of a dualistic understanding of the human person that quarantines mind and body from one another.

<sup>85</sup> "The real fault in the kind of universal knowledge defined by Laplace is that it would tell us absolutely nothing that we are interested in. Take any question to which you want to know the answer. For example, having planted some primroses today, you would like to know whether they will bear blossoms next spring. This question is not answered by a list of atomic positions and velocities at some future moment on May 1 of next year. *Primroses*, as such, are lost in the topography of *all* the atoms. Your question can only be answered in terms of primroses. The universal mind is utterly useless for this purpose unless it can go beyond predicting *atomic* data and tell us whether they imply the future blossoming or failure to blossom of the *primroses* planted today" (Polanyi & Prosch, 1975, p. 29).

common sense strategy to attempt to justify kinesiology by appealing first and foremost to the natural sciences?

Michael Polanyi argues that such thinking emanates from a profound misunderstanding of the nature of science. Science is, Polanyi argues, a function of commitment rather than detachment and cold objectivity. Science is not epistemologically superior to the humanities because both are built on the passionate commitment of a connoisseur; connoisseurs who develop their own personal skill and judgment in an attempt to discover a clearer picture of reality. A scientist, who, in the name of detachment, did not subject himself to the authority of the scientific community through apprenticeship and the a-critical - that is faithful - acceptance of the traditions of science, the general validity of previous research, as well as the general legitimacy of the larger culture and language that supports the scientific enterprise, would never actually achieve the goal of becoming a part of the practicing scientific community.

“Scientific inquiry is accordingly a dynamic exercise of the imagination and is rooted in commitments and beliefs about the nature of things. It is a fiduciary act. It is far from any skepticism in itself. It depends on firm beliefs. Nor should it ever give rise to skepticism. It’s ideal is the discovery of coherence and meaning in that which we believe exists; it is not the reduction of everything to a meaningless jumble of atoms or accidentally achieved equilibrium of forces. Science is not thus the simon-pure, crystal-clear fount of all reliable knowledge and coherence, as it has for so long been presumed to be. Its method is not that of *detachment* but rather that of *involvement*. It rests, no less, that our other ways of achieving meaning, upon various commitments which we personally share” (Polanyi & Prosch, 1975, p. 63).

When this misunderstanding of the nature of science is buttressed up against the underlying dualistic assumption in the Academy that kinesiology is a subject that only deals with the body, it is not surprising that insecure kinesiologists run for the cover of positivistic empiricism. If Aristotle, and in turn Polanyi are correct, such panic is unjustified.<sup>86</sup>

Motion is woven into the human fabric. This is true both in the ontological sense, in that no account of human beings makes sense without accounting for the change and activity *kinesis* makes possible, but also in the more contextual locomotive sense (i.e. the types of activities that encompass human culture, the types of human locomotion we find important and meaningful). Motion is at the heart of how we are, and as Polanyi points out, it is at the heart of how we know. Aristotle's conception of motion and being as *entelecheia* is consistent with Polanyi's epistemology of "tacit knowledge." Polanyi scholar and friend Drusilla Scott makes this point when discussing the necessary role of the tacit in the science of classification. Scott argues that tacit knowledge makes sense of how we identify something - like a dog- because it takes into account the whole; even the "unscientific." Such recognition takes training and skill, and as we have seen, cannot be reduced to a list of particular attributes.

"Living micro-organisms never look exactly like the diagram in the book; spots on baby's face aren't identifiable as measles just from reading their

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<sup>86</sup> Pride in the profession, it turns out, is not a function of how fast we turn in our whistles for lab coats. Remarkably kinesiologists themselves [particularly in pedagogy] often seem to be the most incapable of recognizing their own intrinsic importance. It as if in the rush to legitimize the field, a Faustian bargain was made where kinesiologists mistakenly exchanged a visceral self-understanding for a systematic but vapid and wholly utilitarian sense of purpose.

medical description. There is always an element of skilled recognition, integrating clues which cannot be exactly specified" (1995, p. 53).

It is Polanyi's epistemology of tacit knowledge that describes this new broader understanding of knowledge and reshapes objectivity in such a way that skills, intuition and judgment (a central feature of both sport and the humanities) are recognized as necessary components of all knowledge. The shape of, need for, and import of this shift in epistemology are the subject of chapter four.

## Chapter 4- Objectivity and Tacit Knowledge

Although this chapter essentially shifts gears to epistemological questions, Polanyi's work does have important parallels to the work of Aristotle. Aristotle's argument in favor of being as being-at-work, as well as his definition of *kinesis* raises serious problems for a materialistic paradigm, by showing that the "whole is more than the sum of its parts." Polanyi's reconception of epistemology - "tacit knowledge" - is highly compatible with Aristotle's metaphysics. The triadic structure of "tacit knowledge" is born of *kinesis* (and *entelecheia*). Humans grow, commune<sup>87</sup>, teach, and acquire the subsidiaries *from which* they reach out to the world. Knowledge and truth are embodied and personal, not merely propositional. Such an insight is not meant to deny the reality of propositional knowledge. Rather the intent is to deny reality of a world of "bare facts." Knowledge, even propositional knowledge, is embodied in the knower. Knowledge is fundamentally kinetic.<sup>88</sup>

Combating the assumption that a scientific worldview suggested and consequently required a materialistic outlook was one of Michael Polanyi's chief philosophic objectives. According to Polanyi, a materialistic epistemology, that

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<sup>87</sup> It is worth remembering Aristotle's famous assertion in the *Politics*, that a "man is by nature a political animal" (1253a1).

<sup>88</sup> Again one is reminded of Aristotle. "All human beings by nature *stretch* themselves out towards knowing" [Emphasis Added] (Metaphysics, 980a21).

discounts or explains away all non-empirical claims, is a philosophic rather than a scientific commitment. A materialistic epistemology is also ultimately self-contradictory because of the doubts it engenders. Rather than being the ideal of knowledge, a strict materialism actually undermines the free inquiry upon which science relies. Materialism destroys freedom of thought by destroying the foundation upon which freedom of thought relies.<sup>89</sup> In a world where only the measurable is valid, ideas become illusory. In a world where ideas are illusions, freedom of thought- itself an idea - is an illusion as well. In contrast to the standard materialistic account of science, Polanyi argues that the truth of scientific knowledge, like the truth of humanistic knowledge is born of commitment, not detachment, and is thereby ultimately constituted not on “bare facts”, but rather faith. This is not to say that one could blindly commit themselves to any proposition at all. Facts are crucial. Polanyi’s point is not to discredit facts, but to point out that absent a fiduciary foundation, *there are no facts*. It is upon a foundation of belief that all knowledge, scientific or otherwise, is grounded.

“The acceptance of scientific statements by laymen is really based, not on their own observations, but on the authority that laymen acknowledge scientists to have in their specific fields; and this is true to nearly the same extent of scientists using results of sciences other than their own: they do

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<sup>89</sup> Polanyi wrote: “But, of course, ethical principles, cannot, in a strict sense, be demonstrated: you cannot prove the obligation to tell the truth, or to uphold justice and mercy. It would follow therefore that a system of mendacity, lawlessness, and cruelty is to be accepted as an alternative to ethical principles and on equal terms. But a society in which unscrupulous propaganda, violence, and terror prevail offers no hope for tolerance. Here the inconsistency of a liberalism based on philosophic doubt becomes apparent: freedom of thought is destroyed by the extension of doubt to the field of traditional ideals, which includes the basis for the freedom of thought” (Polanyi and Prosch, 1975, p. 10).

not feel called upon, or even competent, to test these results themselves. Scientists must rely heavily for their facts on the authority they acknowledge their fellow scientists to have. (1975, p. 185)

By insisting on a fiduciary element in science, Polanyi means that science is ultimately a matter of inarticulate knowledge, reliance by the inquirer on a community, skilled judgment, and a *passionate* desire for the truth.<sup>90</sup> The import of such an assertion, assuming it is defensible, should be clear. Science and the humanities are built on the same foundation. One does not have an inherent epistemological advantage over the other. Polanyi insists that the role of commitment in the pursuit of scientific insight should be recognized rather than feared, for it is only through such recognition that a free society could ultimately withstand the assaults of an all-encompassing skepticism.

This chapter will pursue two main goals in an effort to fortify and extend Polanyi's thinking. First I will give an expanded analysis of Polanyi's critique of modern materialistic epistemology. This critique will also dissect the spirit of skepticism to which materialism gives birth. Second, the chapter will reconstruct Polanyi's conception of, "tacit knowledge" in an attempt to show how such a reconceived epistemology lessens the tension between the sciences and humanities. If such a reduction in tension is possible, it would certainly be of great use in kinesiology. Polanyi believed that only a reconceived epistemology could restore to humanity the ability to recognize and appreciate meaning in the

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<sup>90</sup> "We can find only by searching, and we can search only if we believe there is something to be found – which is believing that we do *not* live in a 'hostile' universe but rather in one upon which we can rely for support" (Polanyi and Prosch, 1975, p. 223).



world. In undertaking such a critique, Polanyi obviously set for himself a daunting task. He was convinced that science – the guiding authority of the twentieth century- had fundamentally misinterpreted the implications of its own insights into the nature of reality.

Polanyi's analysis begins with the argument that the ideal of "strict objectivity" found in scientific inquiry is a myth. Polanyi reminds scientists of the absolutely necessary part their humanity plays in their research. His critique then turns its attention to the ultimately self-destructive nature of commitments to strict impersonal objectivity and the skepticism such beliefs encourage.

Scientists, Polanyi insists, are not outside their own system of observation. Positivism, the idea that the only strictly verifiable is real and trustworthy, is untenable. In fact, positivism must be mistaken if scientific knowledge is real. Because scientists rely on their senses for their data, their culture for language, and each other for research knowledge outside of the area of expertise, scientists cannot claim that their knowledge is strictly limited to the empirically verifiable. A skeptical philosophy built on a misguided empiricism, if taken to its logical conclusion, would inevitably undermine its own foundation. Because science is built on a cultural foundation, the destruction of that foundation – by a reductionistic materialism - would thereby destroy science as well.

Even measurement, data gathering, and other supposedly "untainted" sources of objective knowledge, require personal skill and judgment. Personal skill, in turn, is dependent for its development on a *community* of scientists. The

scientific community educates new scientists and transmits interpretive skills to the next generation. Polanyi argues that measurement is like map-reading. “No map can read itself. Neither can the most explicit treatise on map-reading read a map” (1975, p. 30). Only a human being can read a map. Only a human being skilled in map-reading can *read a map well*.

Numbers are tools by which scientists inquire into the nature of the world. They are real.<sup>91</sup> They are powerful. But they do not measure themselves. Just as a hammer needs a skilled carpenter, data needs - both in the gathering and in the analysis - a skilled scientist to guide and evaluate the research process.

“At both the beginning and the end we identify numbers with observed events, and this too is a kind of map-reading, for which we must rely once more on personal skill. *Numbers themselves do not point to events...* You might think that Newton’s laws could predict the exact position of the planets at any future moment of time. But this they can never do. Astronomers can merely compute from one set of numbers, which *they identify* with the position of a planet at a particular time, another set of numbers, which *will represent* its position at a future moment of time” (Polanyi and Prosch, 1975, p. 30). [Emphasis Added]

Data always beg a question, an all important question - namely, what do these data mean? Further data collection *will not provide an answer*. Rules of interpretation *will not provide an answer*. For such rules are themselves in need of interpretation.<sup>92</sup> Only personal judgment will suffice; a personal judgment that

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<sup>91</sup> It is worth noting that a belief in the reality of numbers is not belief in a material reality. I can’t pick out the number one, nor can I analyze the square root of two under a microscope. The reality of numbers is a faith - by scientists - in the reality of intangibles. This faith is so taken for granted in the case of mathematics and measurement that it is usually missed.

<sup>92</sup> “Any rules we have must be applied, of course; and, to do this, we may have additional rules for their application. But we cannot go on having specific rules for the application of specific rules for the application of specific rules ad infinitum. At some point we must have ‘rules’ of application (if we can call

cannot be –as will be seen in the upcoming discussion of tacit knowledge - wholly articulated. Understanding data requires the skilled judgment of the knower, born of connoisseurship and practice.

“We may conclude quite generally that no science can predict observed facts except by relying with confidence upon an art: the art of establishing by the trained delicacy of eye, ear, and touch a correspondence between explicit predictions of science and the actual experience of our senses to which these predictions shall apply” (Polanyi and Prosch, 1975, p. 31).

Because such skills are not born in a vacuum, scientific knowledge requires a supporting culture. A materialistic epistemology avoids accounting for this reality only by taking it for granted. Tacit knowledge – the inarticulate skilled inquiry - engrained in the enterprise of empirical study is glossed over because it is so commonplace that it seems inconsequential and because it threatens the ideal of absolute objectivity. Such an epistemology accepts the fruits of knowledge but rejects the intricately branched tree from which knowledge springs forth. Or, put another way, a materialistic epistemology breeds skepticism because the proponents of this type of philosophic doubt have disregarded the tree; while reaching out from its branches to pick fruit. The allure of the fruit of scientific inquiry encourages many to embrace positivism, while ignoring the non-empirical, non-skeptical soil out of which such knowledge grows.

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them that) which we cannot specify, because we must simply dwell in them in a subsidiary way” (Polanyi and Prosch, 1975, p. 61).

This type of oversight is not trivial or pedantic but rather lies at the heart of the matter. A positivistic philosophy that doubts or openly denies the reality of non-empirical knowledge will create and support a very different understanding of kinesiology than would one that defends a broader understanding of knowledge. A philosophy of kinesiology built on materialism and positivism has no need to inquire into human values, because in such a system, human values, insofar as they exist, can be explained best at the chemical and atomic levels.

It is easy to see then, that if the field continues to be dominated by materialistic thinking, the humanities will survive, at best, on the margins of kinesiology. If the assumptions of scientific materialism are correct, no harm is caused by neglecting the humanities. In fact, if the tenets of materialism are well founded, quite the opposite is true; by focusing on the humanities students are neglecting the actual and sole real source of human values, chemistry and physics. If however, as Polanyi argues, values, beliefs, and commitment, are at the heart of human knowledge (including scientific knowledge), then such a neglect of the humanities is undoubtedly misguided and will have dire consequences.

The skepticism that results from this type of scientific materialism leads to other harms as well, including many misleading dichotomies; between for instance value and fact, and emotion and reason (Polanyi, 1962; MacIntyre, 1984; Midgley, 1994). The amputation of values out of the world of "facts," as

philosopher Mary Midgley points out, has the unfortunate consequence of giving the materialistic interpretation of the world an air of impenetrability.<sup>93</sup>

Yet, science, despite many scientists' claims to the contrary, is not, and cannot be, morally neutral.<sup>94</sup> "A choice of interpretive schemes," Midgley insists "is not just a choice of convenient laboratory equipment. Different interpretations express different emphases. They endorse different principles of selection. They determine what will be attended to" (1994, p. 46).

In contrast to the ideal of cold objective superiority found in the epistemology of scientific materialism, Polanyi's theory of tacit knowledge allows for reconciliation among scientists and humanists by insisting on the reality of personal participation in all knowledge. The sciences and the humanities are both built on the integration of skill, belief, and imagination. Both are meaningful and real knowledge domains. It is only by, "dwelling-in" a particular domain, as Polanyi puts it, that we come to cultivate the necessary judgment, skills, and passion required for knowledge. This is as true in physics as it is in philosophy; as true in baseball as it is in biomechanics.

It is only on a foundation of skills and apprenticeship, that a person becomes a scientist, or a philosopher, or an artist. Such connoisseurship cannot be fully articulated. This implies of course that practice usually precedes theory.

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<sup>93</sup> "The peculiar and unlucky thing about the present situation is that people do not see the current world-view as open to this kind of challenge at all because they do not see it as *one optional moral position among others*. They perceive it as *a scientific fact* that must simply be accepted. It has acquired a quite unsuitable kind of authority"[Emphasis Added] (Midgley, 1994, p. 31).

<sup>94</sup> This is not to say that fairness and impartiality are bad things. They are most certainly good things. But notice what was said; they are *good* things.

Theory is dependent on and impotent without the practice(s) upon which such theory is based. All the educational theory in the world, for instance, is vapid and hollow without the ability to apply it in the classroom, an ability that extends far beyond the mechanical application of theoretical rules.<sup>95</sup>

Reading the greatest treatise on how to hit a golf ball will not make one an excellent golfer. It may improve one's game, but only in so far as one skillfully applies, and learns to embody that knowledge on the course in that actual practice of hitting golf balls. To become a master golfer is to embody - through dedication and practice - knowledge that cannot be fully encapsulated in a book. The same is true in the pursuit of scientific knowledge as well. Scientific learning is much more than book knowledge.<sup>96</sup>

Facts, in other words, arise from values. This is not to say that facts are value determined but rather value dependent. It is only in and through a culture that human beings develop mature cognitive powers.<sup>97</sup> It is only in and through commitment that experience becomes anything more than noise. "Does this not

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<sup>95</sup> Another useful way to think of this point is through the use of recipes. A huge amount of the information needed to successfully cook is not contained in the written words of the recipe. "Cook until golden brown," beat to a "stiff peak" need skillful application and interpretation. What *exactly* a stiff peak is cannot be written down.

<sup>96</sup> As Polanyi observed: "Textbooks of chemistry, biology, and medicine are so much empty talk in the absence of personal, tacit knowledge of their subject matter. The excellence of a distinguished medical consultant or surgeon is due not to his more diligent reading of textbooks but to his skill as diagnostician and healer- a personal skill acquired through practical experience" (Polanyi & Prosch, 1975, p. 31).

<sup>97</sup> The fascinating case(s) of feral children, children raised in the wild by animals, or in complete isolation, support such an assertion. Most such children when returned to society are subject to severe learning and linguistic deficits that appear to be essentially permanent. Human beings are not fully autonomous beings, but rather part of a community to which they contribute. This community is certainly something which one can alter and improve, but it is also something to which, in some sense, all must submit.

impose limitations on our power of knowing the real world?" asks Polanyi scholar Drusilla Scott, "Yes, being a particular person or belonging to a particular culture does limit our vision, but without these limitations there is no vision" (1995, p. 73). Science is, as fellow philosopher of science Thomas Kuhn (1996) pointed out, a fundamentally human enterprise. Consequently, science is interested in human questions and reliant on human culture and human institutions. Polanyi makes this point beautifully at the very beginning of

*Personal Knowledge:*

"Alternatively, if we decided to examine the universe objectively in the sense of paying equal attention to portions of equal mass, this would result in a lifelong pre-occupation with interstellar dust, relieved only at brief intervals by a survey of incandescent masses of hydrogen – not in a thousand million lifetimes would the turn come to give man even a second's notice. It goes without saying that no one – scientists included – looks at the universe this way, whatever lip-service is given to 'objectivity'" (1962, p. 3).

Scientists are not stoics. If objectivity is understood as fair but passionate inquiry, guided by honest interpretation of the evidence, then describing scientists as "objective" makes perfect sense. If, however, objectivity is understood as dispassionate and disinterested inquiry into a world of "bare fact," it is a fiction.<sup>98</sup> Scientists pursue what they find *interesting*. Scientists pursue what that they think is *important*. Scientific intuition suggests avenues of research full of potential. Scientific intuition suggests "clues to something hidden" (Polanyi, 1975, p. 193). Scientists pursue, as they should, research that they believe will

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<sup>98</sup> Polanyi insists that, "The surmises of a working scientist are born of his imagination in the quest for a genuine discovery. Such an effort *risks* defeat by submitting these surmises to rigorous tests, but never *seeks* it. In fact it is his craving for success that makes the scientist take the risk of failure" (1975, p. 195).

bear fruit. A single lifetime is too short; questions are too fascinating, and training and expertise too precious, to be squandered on random inquiry.

“There is a widespread opinion, conflicting with what we have just said, that holds that scientists hit on discoveries merely by trying anything that happens to cross their minds. This opinion results from a failure to recognize man’s capacity for anticipating the approach of a hidden truth. The scientist’s surmises or hunches are the spurs or pointers of his search. Since they involve high stakes, they are as hazardous as their prospects are fascinating. The time and money, the prestige and self-confidence, gambled away in disappointing guesses will soon exhaust a scientist’s courage and standing” (Polanyi, 1975, p. 194).

It is important to reinforce the point that science as such is not the target of Polanyi’s criticism. Nor is it the target of mine. Scientific insight, measurement, and empirical inquiry are all real goods. Michael Polanyi was himself a world class scientist and fully supported the efficacy of scientific research.<sup>99</sup> “Scientific genius has extended man’s intellectual control over nature far beyond previous horizons...scientific rationalism has evoked a movement of reform which has in the past hundred and fifty years improved nearly every human relationship, both public and private” (1975, pp. 24-25). What he did not support, what he found so dangerous, what he found unnecessary, was the underlying

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<sup>99</sup> Those who attempt to discredit Polanyi’s work by attacking his credentials are on very weak ground. Polanyi published or co-wrote, approximately two hundred scientific publications, including several publications in *Nature*. His economic and philosophic bibliography is equally impressive. Polanyi worked and interacted with some of the leading thinkers of the twentieth century from a broad range of disciplines. During his lifetime Polanyi interacted with, to name a few, Einstein, Piaget, Kuhn, Maslow, T.S. Eliot, and Tillich (Scott and Moleski, 2005). This type of criticism is, I believe, an attempt to deflect attention away from the arguments themselves because Polanyi raises uncomfortable and problematic questions about the status of scientific materialism. These questions are more easily avoided than addressed. A similar deflection occurs by alleging that an argument is merely the product of ‘zeitgeist.’ (I.e. Polanyi was writing during the Cold War, hence his concerns about totalitarianism and scientific materialism are merely a function of the paranoid spirit of times. Now that the Cold War is over, it follows that his assertions regarding the relationship of materialism to nihilism and nihilism to totalitarianism can be ignored; without ever actually being addressed.) That an argument is influenced by the spirit of the times may of course be true. We are still left, however, with the question, “Are the arguments themselves true?”



commitment to the philosophy of scientific materialism. This philosophy was built on the reduction of “all life, all human beings, and all works of man” to “the forces acting between atomic particles” (Polanyi and Prosch, 1975, p. 25). The root of this problem lay not in science but in the corrupt epistemology, that was growing like a weed, out of fertile soil of scientific success. Scientific success had encouraged many to mistakenly adopt skepticism and doubt - through their commitment to materialism - as the ultimate arbiters of truth.

Certainly doubt is not in and of itself bad. Polanyi is himself raising doubts about conventional understandings of the nature of science. Polanyi’s point is that skepticism and doubt *cannot be ultimate epistemic values*. The root of all human knowing was not based in doubt but rather belief. Unfortunately, a materialistic emphasis on the tangible had encouraged a reductive understanding of the nature of knowledge, an understanding that left no room for the reality of human ideas, values, or passions. “It is simply this sort of mechanical reductionism,” Polanyi laments, “that is the heart of the matter. It is this that is the origin of the whole scientific system of scientific obscurantism under which we are suffering today” (1975, p. 25).

According to such an epistemology only the measurable and tangible are objectively valid because only the measurable could adequately withstand philosophic skepticism. Only the measurable could be considered objective. Since values cannot be empirically verified, and because measurement is the litmus test of reality in a materialistic philosophy, values are not objective. The

reality of values, given such materialistic commitments, is justifiably doubted. The desire for a strictly impersonal understanding of objectivity makes values appear untenable. Because of this, *all* metaphysics are labeled, *a priori*, as indefensible impositions of “purpose” and “order” onto the subject of inquiry. Consequently, Polanyi warned that these two epistemological commitments (materialism and skepticism), would destroy the possibility of moral truth.<sup>100</sup>

Polanyi saw firsthand in Communism and Nazism, the ravages of what, he became convinced, was the natural result of this type of ill-conceived epistemology. The false ideals of absolute objectivity and scientific materialism had rendered man’s moral impulses disreputable. Because moral motives could have no foundation in scientific materialism, all motives were open to suspicion or worse yet were reducible to underlying material motives. Justice, truth, integrity were all empty concepts, or were illusory justifications of underlying ulterior motives such as the need to control, the desire for profit, or the will to power.

“Such was the final measure of this liberation: man was recognized henceforth as maker and master, no longer servant, of what had been his ideals. This liberation, however, destroyed the very foundation of liberty.” (1975, p.14)

Hence humanity’s ideals were explained away, or, were “driven underground” by a desire to avoid hypocrisy. “Such self-suspicion,” Polanyi declares, “does torment our age, and particularly many of our youth, seducing them into

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<sup>100</sup> “As long as science remains the ideal of knowledge, and detachment the ideal of science, ethics cannot be secured from complete destruction by skeptical doubt” (Polanyi and Prosch, 1975, p. 27).

destructive forms of moral expression, since these alone seem proof against self-doubt" (1975, p. 23).

Allegiance to such a nihilistic philosophy redirects man's moral passions away from transcendent ideals to materialistic ends, such as Freud's pleasure principle, or Marx's class interest.<sup>101</sup> Polanyi calls this reassignment of moral desires to material ends, "moral inversion" (Polanyi, 1962, 1975). According to Polanyi, the logic goes something like this. Man is a mere beast, driven by his stomach or other material causes. Any pretense regarding higher motives is hypocritical. Hence those who openly embrace savagery are actually morally superior; for the brute admits his motives while the "moralist" disguises their own brutality behind "ideals." Honesty is, for those attracted to such thinking, the only defensible virtue.<sup>102</sup>

The moral-invert gives outlet to his desires for truth and justice, by passionately diverting them to the intellectually respectable realm of an all-encompassing materialism. The irony of the *passionate commitment* of such moral-

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<sup>101</sup> G.K. Chesterton offers a particularly insightful description of the hollowness of this type of reductionism. "But there is a deeper fallacy besides this obvious fact; that men need not live for food merely because they cannot live without food. The truth is that the thing most present to the mind of man is not the economic machinery necessary to his existence; but rather that existence itself; the world which he sees when he wakes every morning and the nature of his general position in it. There is something that is nearer to him than livelihood, and that is life" (Chesterton, 1925, p. 139).

<sup>102</sup> Why, one may ask, would being a (dishonest) Machiavellian brute be problematic under such a nihilistic philosophy? Why, in other words, should honesty remain as the only virtue? Honesty matters to the nihilist, not so much as a virtue, but rather as a tool by which the necessary unmasking of traditional ideals must be procured. Why must traditional ideals be unmasked? Because, such ideals even if left in place for purely cynical and utilitarian reasons, limit the liberty of the nihilist to freely engage in traditionally immoral behavior. The only truth (to be honest about) is that there is no truth.

inverts is self-evident. “Our age,” Polanyi laments, “is racked by the fanaticism of unbelievers” (1975, p. 28).

The results of such moral-inversion were untenable not only for society but for science as well. A skepticism that calls into question all traditional moral claims, will eventually call into question the claims of intellectual liberty upon which science itself relies. Worse yet, if material causes lay at the root of human conduct and human society, then there is no justification for allowing scientists to pursue intrinsically interesting questions. For intrinsic interest is in reality only a function of material causes. It follows then that only utilitarian justifications of science remain intellectually defensible.<sup>103</sup> It should be clear then why an unbridled skepticism is so dangerous. Skepticism cannot be an ultimate epistemic value because of the self-defeating logic it entails.

In fact, Polanyi insists that the argument against skepticism can even be taken a step further. Skepticism itself is founded ultimately, not on doubt, but rather belief. That is, statements of affirmation (“I believe p”) and denial (“I believe not-p”) are both matters of assent (1962, p. 272). Skeptical doubt is grounded not in the absence of beliefs but rather in the *rejection of some beliefs in favor of others*. “Since the sceptic [sic] does not consider it rational to doubt what

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<sup>103</sup> As Polanyi insightfully argues, “A discovery will no longer be valued by the satisfaction which it gives to the intellectual passions of scientists, but will be assessed according to its probable utility for strengthening public power and improving the standard of living. Scientific value will be discredited and its appreciation suppressed. This is how a philosophic movement guided by aspiration of scientific severity has come to threaten the position of science itself. This self-contradiction stems from a misguided intellectual passion – a passion for achieving absolutely impersonal knowledge which, being unable to recognize any persons, presents us with a picture of the universe in which we ourselves are absent” (1962, p. 142).

he himself believes, the advocacy of ‘rational doubt’ is merely the sceptic’s way of advocating his own beliefs”<sup>104</sup> (Polanyi, 1962, p. 297).

Skeptics advance their own convictions through the tacit adjudication of *what counts as rational*. This adjudication is not merely a matter of data, but of culture and tradition, education and judgment.<sup>105</sup> In fact, the skeptic, despite the self-contradiction inherent in such a proposition, does not doubt the need for the education of the young (and necessarily) impressionable. The skeptic simply doubts the (traditional) grounds upon which such education is often constituted. “What they [skeptics] actually want is not expressed but concealed by their declared principles. They want their own beliefs to be taught to children and accepted by everybody, for they are convinced that this would save the world from error and strife” (Polanyi, 1962, p. 297).

In contrast to such skepticism, tacit knowledge openly acknowledged the necessity of commitment and a reliance on the inarticulate. Polanyi argues that all knowledge is a function of three integrated elements; the self, subsidiaries, and the focal target of inquiry. Knowledge requires a skilled knower (a self) who reaches out into the world (toward a focal target or point) in pursuit of

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<sup>104</sup> Or put another way: “The fiduciary character of doubt is revealed by the limitation to ‘reasonable doubt’ characteristic of law and also skeptical philosophy. To urge that doubt must be reasonable, is to rely on something that cannot reasonably be doubted – that is, in legal phrase, a ‘moral certainty’ (Polanyi, 1962, p. 274).

<sup>105</sup> This neither confirms nor denies the efficacy of the world-views of the “skeptic” and the “believer.” It merely levels the playing field. Once the fiduciary element in knowledge is acknowledged, neither position stands in an *epistemologically* superior position. Of course, one or the other may certainly be superior as a description of reality.

knowledge.<sup>106</sup> Such focal knowledge is acquired on a foundation of subsidiaries. Subsidiaries are gained through experience and make focal awareness possible. Subsidiaries consist of such things as intellectual tools, personal history, skills, biology, and culture. Subsidiaries are what influence, inform, and make inquiry possible. Education and apprenticeship cultivate the subsidiaries necessary to skillfully attend to a particular branch of knowledge.

One of Polanyi's favorite examples of how tacit knowledge could be seen at work was the task of hammering nails. To hammer nails, a person attends *from* the subsidiary awareness of the hammer in their hand, *to* the focal target, the nail. It is only by being subsidiarily aware of the hammer, the palm, and the movement of the arm that the focal awareness on the nail is made possible. An unskilled carpenter, by way of contrast, must attend to the hand and the hammer rather than the focal goal of pounding in the nail. Therefore they are much more likely to end up with bent nails and purple thumbs, than is the experienced carpenter who can attend directly *to* the nail, *from* his skills.

Thus tacit knowledge is also described as from-to knowledge. If Polanyi's theory is correct then it follows that the ultimate grounds of human knowledge are largely unspecifiable. Knowledge cannot be wholly determined nor articulated because it is built on the foundation of subsidiaries, and those subsidiaries cannot be wholly determined nor articulated.

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<sup>106</sup> Knowledge is real and powerful and is therefore in that sense objective. But knowledge is also made possible by the skilled acquisition of a situated knower. Knowledge requires ownership and assent and is therefore personal.

Subsidiaries are ultimately unspecifiable for essentially three reasons. First there are too many subsidiaries to identify them all. As Polanyi asserts, “there is ample evidence that past experiences, which we can hardly recall, affect the way we see things” (1975, p. 34). Our subsidiary catalog ranges from the trivial to the profound, from the music we listen to and the culture we engage, to experiences one had in their elementary school cafeteria, from theology and knowledge of scripture to one’s experiences - long forgotten - at church picnics.

Second, subsidiaries are not wholly specifiable because the integration of subsidiaries happens dynamically. That is, subsidiaries function only as part of a skilled focal recognition. Hence, the third reason becomes apparent. Although it may function as a subsidiary while attending to a focal point, one could never have a *subsidiary as subsidiary*. Once one focuses on a subsidiary it becomes a focal point.<sup>107</sup>

In fact, as common experience proves, to focus on subsidiaries usually destroys the meaning of an activity. Language can be immediately made incoherent by focusing on the sounds that underlie the meaning of the words. Or consider a young parent trying to help their child with elementary school grammar. The parent will likely find that although they know the English language, they know it tacitly, and will have a hard time remembering the parts of speech and the rules of grammar that allow them to read and write effectively.

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<sup>107</sup> The influence for instance that your 5<sup>th</sup> Grade teacher had on your appreciation of literature can never be seen “as influence.”

Their knowledge of English has become so skillful that it is an almost completely subsidiary awareness from which they reach out into the world of communication, literature, and speech.<sup>108</sup>

In performance activities – like sport – such a shift from the focal point to the subsidiaries effectively *paralyzes* the performer. The surest way to miss a free throw is to think about the proper steps of free-throw shooting technique while standing at the line. The slumping hitter in baseball is the most likely to be analyzing his swing. He is attending *to* what he should be attending *from*.

“Or if we focus our attention on a spoken word and thus see it as a sequence of sounds, the word loses its meaning to which we had attended before. Or again, we can paralyze the performance of a skill by turning our attention away from its performance and concentrating instead on the several motions that compose the performance” (Polanyi and Prosch, 1975, p. 38).

This insight further buttresses Polanyi’s claim that knowledge is built not on doubt, but rather belief.<sup>109</sup> *One cannot stand on subsidiaries and be critical of them at the same time.* Tacit knowledge functions only when one was comfortable admitting the role of skill, intuition, and judgment in the acquisition of knowledge. In fact, Polanyi makes a direct connection between his epistemology of tacit knowledge and the work of Saint Augustine. Polanyi believed that the

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<sup>108</sup> Likewise children first learn their native language tacitly, through observation, trial, error, and correction. Formal instruction in grammar and the parts of speech plays little if any role.

<sup>109</sup> William James makes a similar point in his classic essay *The Will to Believe*. “A whole train of passengers (individually brave enough) will be looted by a few highwaymen, simply because the latter can count on one another, while each passenger fears that if he makes a movement of resistance, he will be shot before anyone else backs him up. If we believed that the whole car-full would rise at once with us, we should each severally rise, and train-robbing would never even be attempted. There are, then, cases where a fact cannot come at all unless a preliminary faith exists in its coming!” (1956, pp. 24-25)



self-destructive shortcomings of materialism had become so apparent that “critical philosophy” (1962) should be rejected. Polanyi identifies critical philosophy as a philosophy which is built on skepticism and doubt. In turn he argues that tacit knowledge is a return to an a-critical (or post-critical)<sup>110</sup> philosophy- first established by Saint Augustine -that encouraged the legitimacy of the “deliberate holding of unproven beliefs” (1962, p. 268). It is commitment, not doubt, upon which knowledge is built.

Post-critical commitment recognizes the inarticulate and fiduciary foundation of knowledge. It is in such recognition that Polanyi sees a direct connection to Augustine’s conception of “faith seeking understanding.” It is only in committing oneself to belief (in one’s culture, in the authority of one’s teachers, etc.) that one could make any progress toward knowledge.<sup>111</sup> It is only through such a commitment to a community, to beliefs and ideals, and to the pursuit of truth, that knowledge got off the ground. In fact, such a commitment is possible only if held a-critically. Or if put into Polanyi’s language, it is only

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<sup>110</sup> Polanyi used the term post-critical due to his chronological vantage point. That is, he was arguing after both Augustine’s a-critical and modernity’s critical philosophies.

<sup>111</sup> In turn, Augustine foreshadows Polanyi’s idea of tacit knowledge. In discussing the limited effectiveness of theory (rules) when compared with skills, Augustine says “It is as if someone who wanted to give rules about walking were to tell you that your back foot should not be raised until you have put down your front foot, and then describe in minute detail how you should move the joints of your limbs and knees. He would be right; walking in any other way is impossible. But people find it easier to walk by actually doing these things than by paying attention to them as they do them or by assimilating rules when they hear them” (1997, p. 62).

Or again, “For even those who have learnt the rules [of rhetoric] and speak fluently and stylishly are not able to consider them as they speak in order to make sure that they are following them (unless of course they are discussing the actual rules). Indeed I think there are hardly any who are capable of doing both, that is, speaking well and considering as they speak the rules of eloquence which promote good speaking. There is a danger of forgetting what one has to say while working out a clever way to say it (Augustine, 1997, p. 103).

possible if it is held dogmatically. It is only through these dogmatic commitments, that one gains any legitimate grounds upon which to criticize and improve one's own community. Only a community that believes in the reality of truth and justice can fall short of its own ideals. Only one who faithfully trusts the community in which they are born can hope to gain the tools by which to later criticize or reform it.<sup>112</sup>

“We must recognize belief once more as the source of all knowledge. Tacit assent and intellectual passions, the sharing of an idiom and of a cultural heritage, affiliation to a like-minded community: such are the impulses which shape our vision of the nature of things on which we rely for our mastery of things. No intelligence, however critical or original, can operate outside such a fiduciary framework” (Polanyi, 1962, p. 266).

Polanyi realizes that use and endorsement of dogma “may appear shocking” (1962, p. 268), for the dangers of dogmatism are well known. Dogmatism has become to the modern ear, an almost exclusively negative term. Polanyi is convinced however that the holding of unproven beliefs was *necessary* whether we recognized it or not. To that extent, everyone is dogmatic. An openly dogmatic orthodoxy based on, and comfortable with, the validity of fiduciary commitment, is a much healthier position to be in than a dogmatic commitment to “objectivity,” because although both schools of thought relied on fiduciary commitments, only one school of thought openly admitted the role belief played in their search for truth.

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<sup>112</sup> “If we cannot accept the justification of holding beliefs uncritically, then our only logical alternative is to wipe out all such preconceived beliefs. And if this proves difficult in practice, we must at least recognize it as our ideal of perfection. We must accept the virgin mind, bearing the imprint of no authority, as the model of intellectual integrity...An entirely untutored maturing of the mind would, however, result in a state of imbecility” (Polanyi, 1962, p. 295).

“We owe our mental existence predominantly to works of art, morality, religious worship, scientific theory and other articulate systems which we accept as our dwelling place and as the soil of our mental development. Objectivism has totally falsified our conception of truth, by exalting what we can know and prove, while covering up with ambiguous utterances all that we know and *cannot* prove, even though the latter knowledge underlies, and must ultimately set its seal to, all that we *can* prove” (Polanyi, 1962, p. 286).

An openly dogmatic epistemology is honest about the commitments it endorses, while a materialistic dogmatism insists that its commitments are merely the result of rational and dispassionate empirical inquiry. Hence the first system is open to questioning, dissent, and reform, in a way that the second can never be. While both types of commitment are co-equal in their potential to be bullheaded and misguided, the openly dogmatic holds one decisive advantage. The self awareness created by such an understanding of the nature of knowledge allows for reflexivity in a way that scientific materialism cannot. As Polanyi warns, “A dogmatic orthodoxy can be kept in check both internally and externally, while a creed inverted into a science is both blind and deceptive” (1962, p. 268).

One of the external checks to which an openly dogmatic understanding of knowledge must submit was reality. Tacit knowledge is not a theory that supported self-set standards or relativistic accounts of knowledge. Rather it asserts *responsibility*. The human person conditioned by the culture in which they were raised had a responsibility towards the reality which they were seeking to understand.

Polanyi insists that, "Our believing is conditioned at its source by our belonging...I shall submit to this fact as defining the conditions within which I am called upon to exercise my responsibility." (1962, p. 322-323). Because knowledge is built on the foundation of one's own subsidiary heritage, knowledge is acculturated. It does not follow from such a claim however that knowledge is therefore merely a matter of one's culture. Rather, returning to Polanyi's central claim, knowledge is personal; it demands the skilled judgment of a knower who to the best of their (particular) ability submits themselves to reality in the search for truth. While truth is real, access to such truth always relies on the particularities of the knower.

"I accept these limits, for it is impossible to hold myself responsible beyond such limits. To ask how I would think if I were brought up outside any *particular* society, is as meaningless as to ask how I would think if I were born in no *particular* body, relying on no *particular* sensory and nervous organs. I believe, therefore, that as *I am called upon* to live and die in this body, struggling to satisfy its desires, recording my impressions by aid of such organs as it is equipped with, and acting through the puny machinery of my brain, my nerves and my muscles, so *I am called upon* also to acquire the instruments of intelligence from my early surroundings and to use these particular instruments to fulfill the universal obligations to which I am subject" [Emphasis Added] (Polanyi, 1962, p. 323).

To charge that Polanyi is a neo-Kantian idealist or a post-modern relativist is to misunderstand his argument. Knowledge is real. The external world is real. Knowledge and reality are not merely a matter of personal opinion, but they do rely on persons. Knowledge requires ownership and therefore an owner. Science is an invaluable tool for bettering human societies, but it is neither the ideal nor the sole source of human knowledge. Knowledge is not a static thing.

Knowledge is not born in a vacuum. Rather knowledge is always situated, and embodied in the personal. It is the fruit of an active and skilled engagement of a knower (a person) with the known (the world). Education and learning are matters of *kinesis*. Knowledge is a function of human-being-at-work.

The theoretical implications of Polanyi's work for kinesiology should be clear. "Science" is not a superior form of knowledge. Even in science, supposedly humanistic qualities like imagination, tradition, and culture are essential. Even hard data require interpretation, which as we have seen, cannot rely on mere rules for their adjudication. Such an insistence on personal participation in knowledge is neither solipsistic nor relativistic, but rather is born of the necessary participation of the knower with the known, who reaches out to discover truth in the real world (Polanyi, 1962). Polanyi does not threaten the veracity of scientific truth claims; rather, he destroys the belief, born of materialism, that science has a privileged and exclusive hold on the truth.

Knowledge is fundamentally a fiduciary act, built on the cultivation of skill and judgment. The fiduciary nature of knowledge can be seen clearly when one considers the actual process of human progress. The simple recognition of the limits of memory, training, and mobility (in the sense of only being able to do so many things in one lifetime) should make clear how we must *faithfully rely* on others for *most* of our knowledge.<sup>113</sup> An educated person cultivates the ability to

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<sup>113</sup> Or consider a practical example. No one person knows all the skills and knowledge necessary for the construction of a 747; and yet by faithfully relying on each other, *we* build them.

judge and discriminate between knowledge claims.<sup>114</sup> Knowledge, particularly expert knowledge, is not merely propositional but also a matter of developing the proper “tastes” of a connoisseur, as well as the faith in the expertise of colleagues. It is situated, communal, and personal. Knowledge is the expression of such “taste,” which is born of the cultivation of the subsidiaries particular to the domain, made possible by the potencies of human *energeia* (being-at-work).

Like Doug Anderson, Polanyi is interested in “democratizing” knowledge. By which I mean that both Polanyi and Anderson are fearful of an epistemology that dogmatically elevates quantification while doubting the veracity of other types of knowledge claims. Polanyi was convinced that all knowledge, even quantification is built on human foundations, and cultivated human judgments.<sup>115</sup> Anderson fears that a “scientific” conception of knowledge ignores “the humanity of movement” and the “procedural knowledge” it produces (2002, p. 94). Such a conception artificially limits the power and self-understanding of kinesiology as a discipline.

Accordingly statements such as Newell’s that the “practice and performance of physical activity is increasingly being de-emphasized if not

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<sup>114</sup> The cultivation of such a sense of judgment is the subject of William James’ essay *The Social Value of the College Bred* (1907).

<sup>115</sup> Again this emphasis on personal participation does not require a relativistic turn. In fact I am inclined in quite the opposite direction by Polanyi’s argument. While the fiduciary and personal foundation of all knowledge may tempt one to reject truth claims even in the sciences, the alternative thesis is just as plausible. If the obviously efficacious realm of science is built on the foundation of tacit knowledge, then perhaps we’ve underestimated the efficacy of the humanities on the faulty assumption that it was merely “subjective.” In other words truth claims in the humanities gain a greater foothold when we realize that both the humanities and the sciences are built on the same foundation.

eliminated from physical activity programs in higher education,” (2007) is not only lamentable, as Newell rightly points out, but also nonsensical. The field of “physical activity” cannot exist if “physical activity” is not practiced and performed. Yet, one can take the argument even further. “Physical activity” as such is *never* practiced or performed! Only culturally significant and specific movement forms are performed. In America at least, such performance usually falls into the category of “play and games” and manifests itself specifically; i.e. baseball, jogging, fly-fishing, soccer, or square-dance. It is therefore impossible to become a connoisseur of “physical activity.” Kinesiologists must again learn to be proud of the specific movement forms - such as sport- which actually inspire, that is, *move* people.

What then are the practical consequence of this re-conception of *kinesis* and “what counts as knowledge” on the field of kinesiology? Can such practical implications actually lead to reconciliation in the field? Can such practical implications actually lead to the elimination of the two cultures in kinesiology? How do the insights of Aristotle and Polanyi make a difference to the day to day practice of kinesiology? Addressing these considerations is the subject of the fifth and final chapter.

## Chapter 5- The Impact of Aristotle and Polanyi on the Field

“Can both scientists and humanists live together in kinesiology?”

The argument presented in this dissertation allows for an affirmative answer. Likewise I believe my work suggests an additional affirmation when the question is restated as “do scientists and humanists *belong* together?” Yet although my re-conception of *kinesis* and epistemology in the field of kinesiology leaves room for reconciliation, it does not require it. Reconciliation must be initiated by the membership and leadership of the field of kinesiology itself.

Adoption of a richer understanding of the nature of both *kinesis* and knowledge would impact kinesiology in at least four ways.<sup>116</sup> First and foremost my argument implies an explicitly holistic self-understanding in the field. Flowing out of this holistic reorientation will be three other areas of concern. These three areas are; a renewed appreciation of the central role played by experience (skill) and practice in kinesiology, a willingness by kinesiologists to embrace definitional specificity, and finally an elevated valuation of activity – requiring the actual practice of skilled, culturally resonant, movement forms - in both undergraduate and graduate programs.<sup>117</sup> As we will see, these four impact

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<sup>116</sup> This is by no means an exhaustive list of how Aristotle and Polanyi affect the contemporary state of kinesiology. I merely claim that these are the areas of impact I find most evident. Readers are certainly welcome to add their own.

<sup>117</sup> Again, I see these movement forms generally falling within the categories of games, play, and sport, although other movement forms such as dance or exercise would certainly be acceptable. The key seems to me to be that the movement forms are historically, personally and intrinsically meaningful to human societies.



areas reform curriculum content, increase departmental fraternity, alter research paradigms, diversify hiring practices, and perhaps most importantly, fortify kinesiology departments' understanding of their mission.

### **Impact Area #1: Holism**

*Kinesis* and *entelecheia* imply a holistic and multi-dimensional approach to human locomotion. The nature of *kinesis* cannot be understood if it is reduced to math, physics and chemistry. Human locomotion is intentional and therefore bound up in ethics, and values, as much as it is in biology. Human beings are not static things, but rather beings-at-work. Human beings are soul-filled *creatures* who yearn, hope, and desire. Human beings are also indisputably historical beings. They have ancestors, and therefore a heritage that is both biological and cultural. Our own ideas are not fully our own. Ideas are born in part as the result of our predecessors' ideas, language, and values.<sup>118</sup> Inheritance is inescapable. Deliberate engagement with one's culture and heritage would then seem to be a mark of education and responsibility.

*Kinesis* cannot be properly understood if it is de-contextualized from the whole of human life. Our being is not static and fixed but rather *alive*. It is in and through motion that humans remain what they are. No account of self directed

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<sup>118</sup> In turn, all of these cultural influences cross-pollinate with our biological inheritance. Genes and ideas are inseparably linked. Our biology limits and influences our choices. Our choices reform and guide our biology. For recent scientific support of this type of thinking see, , Ketay, Aron, Markus, and Gabrieli, (2008), "Cultural Influences on Neural Substrates of Attentional Control," *Psychological Science*, 19, 1, p. 12-17.

locomotion makes sense without perception and desire. Consequently, the kinesiological humanities must receive a greater role in departmental curricula. This is not a call for the humanities to overtake the sciences in kinesiology, nor is it an attempt to avenge previous slights, but rather a call to reconciliation.<sup>119</sup> The aim is to point out the complementary and necessary role of the humanities in departments of kinesiology. As Doug Anderson declares, “To know the mechanics of hitting tennis balls effectively, but be ignorant of Arthur Ashe's social battles, is to be an incomplete kinesiologist” (2002, p. 91).

Human inheritance is most certainly biological, chemical, and physical, but it is also cultural, intellectual, and metaphysical.<sup>120</sup> Questions regarding the import, meaning, and value of kinesiology will not and cannot be answered by turning solely to the sciences. In fact, such an assertion only makes sense within the confines of a strict commitment to scientific materialism, a worldview in which atoms and void are the sum total of reality and human consciousness is a mere epiphenomenon of underlying chemical machinery.

The need for, and neglect of, the humanities in kinesiology will not be news to the well-read kinesiologist. I am far from the first to make such assertions. Yet, as many have pointed out, the humanities currently sit in a precarious position in the field. The commitment to the humanities within

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<sup>119</sup> Nor should scientists see this call to reconciliation as a threat. Holism does not ignore or denigrate science. It does however boldly insist that a science built on the assumptions of materialism is incapable of fully describing reality.

<sup>120</sup> These realities, as discussed in chapter three, are not independent. Instead they are elements of a single human-being-at-work.

kinesiology can no longer be merely ostensible. It can no longer be a mere polite academic point made in passing. Expressions of empathy without action will do nothing to alter the current state of kinesiology.

A serious engagement with the work of Aristotle and Polanyi presented in this dissertation cannot help but reshape and reinforce the need for the humanities in departmental curricula. Because of the vital role the humanities play in understanding the human person, to which the “study of human movement” is dedicated, every kinesiology undergraduate program should have as part of the required curriculum a vigorous engagement with the humanities, (history, philosophy, sociology, literature, etc.). This should apply across sub-disciplines; to students in athletic training as much as to students in teacher preparation.

Although I have personal biases regarding curriculum content,<sup>121</sup> the particular organization of such an engagement with the humanities could be done effectively in many ways. For instance a cross-disciplinary structure could integrate epistemological, ontological, and scientific questions directly into a single course. A course designed around the topic of “encouraging physical

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<sup>121</sup> I would recommend a core history class that covers the broad range of historical engagement with sport and physical activity, as well as a core philosophy class that introduces basic philosophical concepts as well as some of the key philosophic dilemmas in the field.

activity” for example, could provide ample opportunity to investigate the role of the humanities in kinesiology.<sup>122</sup>

A more traditional disciplinary model could be followed as well. Courses, in history, psychology, philosophy, literature, or sociology would be added to the existing curriculum. Students would then be asked to take courses from each sub-disciplinary area. It is not, however, my intent to build curriculum models.

Curriculum decisions should be left in the hands of the kinesiology departments themselves. Department faculty and department heads know their own programs, goals, and resources. Therefore they should be in charge of shaping their own curriculum. If I can persuade kinesiologists that the humanities are one of those *vital* goals, then it follows that appropriate resources will be allocated by kinesiology faculties.

Therefore I will offer only general or guiding principles such programs should follow. I will also broadly outline and defend why such humanities courses are absolutely necessary. Although I will focus this defense around my own areas of expertise – history and philosophy- my intention is not to mandate a one size fits all solution. As just mentioned, if kinesiology faculties are passionately committed to the importance of the humanities in the field of kinesiology, then they can best address how to change their own curricula.

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<sup>122</sup> Certainly both qualitative and quantitative research would be relevant in such a class as would cultural and philosophical questions such as the nature of the human person.

The humanities are a vital and currently neglected element of the curriculum. Inertia will not carry the day. Heavy handed tactics will not carry the day. How exactly proponents of the humanities would address the problem is their own business. What matters is that they see a problem that needs to be remedied.

One vital guiding principle for such curricular reform is that expanding the humanities curriculum cannot be a matter of simply requiring combined courses, such as “the History and Philosophy of Physical Education” or general seminars such as “Introduction to Physical Education.”<sup>123</sup> Such strategies, where and when they exist, are an attempt to save credits in the major for “more important” classes by combining two “unimportant” disciplinary areas into one class. To suggest such a remedy is in reality to suggest no remedy at all. In other words, such attempts are half-hearted, and therefore express either ignorance or indifference towards the *vital* role the humanities have in kinesiology.

In contrast, consider how the combination of physiology and biomechanics into one class would be received by faculty members. Such a decision would certainly be unacceptable in the sciences; likewise such combinations are unacceptable in the humanities.<sup>124</sup> Such a course would rightly be rejected on the grounds that the sciences matter so dramatically in

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<sup>123</sup> Likewise a sociology course should not simply be a glorified research methods course.

<sup>124</sup> The need for trained specialists to teach these classes is similarly imperative. Ethics are important and have a real bearing on a student’s ability to understand *kinesis*. Therefore ethics classes, just like biomechanics classes, demand a professor trained in the field they are teaching. Although stop gaps are sometimes necessary, they should never be seen as permanent solutions. Fixing such stop gaps is no more imperative in the sciences than it is in the humanities.

kinesiology. Courses such as biomechanics and exercise physiology are so rich that to combine them would be a disservice to the students. Likewise, it is because the humanities matter so dramatically that history and philosophy cannot be effectively combined into a single course.

Yet, the claim that the humanities are vital may seem questionable to some.<sup>125</sup> Why then are the humanities so important? What value is there in having history, philosophy, or the “soft” sciences of sociology and psychology in departments of kinesiology? Why are these sub-disciplines so important to kinesiology? Certainly it is my hope is that after reading the preceding four chapters of this dissertation, it is clear that such a question has already been answered. The humanities are vital because they recognize the essential role of the human, the local, and the idiosyncratic in the study of human movement. Although explicit cases could be built for each area of the humanities, I will for the sake of brevity, and in deference to my own areas of expertise, give an expanded defense of only history and philosophy. However, many of the arguments apply to other humanistic disciplines as well.

History matters in kinesiology because it allows students to engage their heritage and see where ideas –both within and without the discipline – came

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<sup>125</sup> This may be a function of “catch-22” logic. Because the humanities are considered unimportant, course offerings are thin and the courses themselves are often unimpressive. For example, many sport ethics classes are currently taught by people without any training in philosophy. This lack of quality and rigor is then used as evidence to justify the neglect of the humanities. The classes are soft because the subject matter is unimportant. The subject matter is unimportant because the classes are so soft.

from.<sup>126</sup> Too often, such ideas are merely taken as self-evident. The study of history centers students within an intellectual and cultural tradition which gives them a sense of context; a sense that they are, as Aristotle continually pointed out, born into the middle of things. Students of history learn for both better and worse that they belong to a tradition. History sheds light on both human virtues and human failings. History allows students to see that the human story is a story of choices, choices that were made, and choices that must continue to be made regarding what matters in life, and what it means to be a human being. Similarly the future of kinesiology is also bound and defined by human choices.

A student who has no appreciation of the historical character of human culture will be hamstrung when addressing the types of practical problems they encounter as kinesiologists. For example, one might consider how a recent kinesiology graduate would go about changing attitudes and behavior among their students or clients regarding proper diet and nutrition. Changing such behavior is not just a matter imparting knowledge regarding caloric intake. Nor is it merely a function of rational argumentation.<sup>127</sup> Nutrition is certainly a matter of science, but *it is also a matter of culture, values, and tradition*. People eat what they eat because of how and where they were raised, because of habits, because of memories they associate with certain foods, even because of their deepest

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<sup>126</sup> Historical knowledge sharpens and develops personal judgment, which as Polanyi so powerfully argues, is an essential element in all knowledge.

<sup>127</sup> This is not meant in any way to denigrate the vitally important role science has to play in the promotion of health. The emphatically pro-humanities tone found in this chapter is a function of the current state of kinesiology, in which the importance of the humanities is doubted on both theoretical and practical levels.

convictions.<sup>128</sup> To change a person's diet is not merely a matter of addressing the science of caloric intake and expenditure, or of convincing "minds" that a healthy diet is in their own best interest. It is a matter of engaging *people* who are situated, cultured, and value-laden beings.

It is clearly appropriate then, to reflect on – that is philosophize about – how such human choices are made. By learning to think philosophically, students attempt to contextualize and evaluate how such choices – whether about, nutrition, exercise adherence, or even the proper role of youth sport in society- *should be made* in the future. In fact such philosophical choices are unavoidable. The only question is *how* they are made. Convictions regarding the nature of reality, the scope and limits of knowledge, as well as the nature of the human person, all deeply influence how one thinks about the field of kinesiology. What is motion? What is a human being? How should we define intelligence? What does it mean to know? How and why does kinesiology promote the human good? How kinesiologists answer these questions will inevitably alter the nature of the discipline. The humanities, in short, are a direct engagement with, and call to, human responsibility.

Certainly, scientific research is also engaged in serving such a call, but in a different way.<sup>129</sup> Through systematic experimentation, scientists attempt to

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<sup>128</sup> Religious dietary restrictions should readily come to mind, but so should the eating habits resulting from the ethical commitments (whether right or wrong) of hunters, vegans, and vegetarians.

<sup>129</sup> Scientific data can influence and give evidence in support of certain normative conclusions, but it cannot ultimately decide between them.



understand the world. Such understanding improves human lives; by improving humanity's ability to alter and improve conditions in the world. However, scientists take the nature of human responsibility for granted; at least in terms of being a course of formal study within their discipline.

It is also true that science can offer solutions to many pressing human problems.<sup>130</sup> But that only furthers the point. Scientific research, as Polanyi insists is not done in a vacuum. No matter how vital science is in solving the world's problems, pressing human problems cannot be *identified as problems* through the writing of a complex equation or through looking into a microscope. Scientific inquiry is intimately tied to human concerns because science is a human enterprise. Philosophy is integral to the scientific enterprise.

All inquiry relies upon a cultural and intellectual foundation beyond the scope of any individual. Inquiry relies on a community that is necessarily broader than the particular expertise of the inquirer. Scientists constantly rely on colleagues' research and expertise without which they could not conduct their own research. Humanists too rely on each other's work when looking for

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<sup>130</sup> Scientific progress offers the possibility of solutions, but does not demand them. Scientific progress absent moral progress is at best impotent. A similar point is made by Pope Benedict XVI in his recent Encyclical *Spe Salvi*. "To put it another way: the ambiguity of progress becomes evident. Without doubt, it offers new possibilities for good, but it also opens up appalling possibilities for evil—possibilities that formerly did not exist. We have all witnessed the way in which progress, in the wrong hands, can become and has indeed become a terrifying progress in evil. If technical progress is not matched by corresponding progress in man's ethical formation, in man's inner growth (cf. Eph 3:16; 2 Cor 4:16), then it is not progress at all, but a threat for man and for the world" (2007).

inspiration and ideas, as well as interpretation, insight, and the vocabulary needed to speak about a particular problem.<sup>131</sup>

Yet this reliance is broader than a merely intra-disciplinary parochial reliance. Both scientists and humanists also rely on one another. Science is philosophically committed. Philosophy is scientifically bound. Scientists cannot escape how they *should* approach their research and how it *should* be used. Philosophers cannot ignore scientific insight. To do so, would be to create a philosophy of no value, born merely of dreams.<sup>132</sup> Both philosophers and scientists are bound to directly engage experience in the world, even if their interpretations of the meaning of that engagement will sometimes conflict.

I have argued that many kinesiologists have philosophically misconstrued experience by believing that human motion and human beings are adequately described by a purely material world. One outcome of this type of worldview is the explicit doubt of any truth claims that are not self-evident, “objective”, or that are not based on direct observations or careful measurements. Only quantifiable data count. But, intangibles such as love, or truth, or justice cannot be measured. If the claims of materialism are true, the need for the humanities in kinesiology is dubious at best. Following Polanyi, I have argued the alternative position that no human inquiry can proceed without commitment and trust. Every question whether philosophical or empirical, requires personal skill, commitment, and

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<sup>131</sup> Both further rely on the electrician, plumber, information technology specialist...

<sup>132</sup> Even if a philosopher disagrees with the interpretation of the results in a given scientific paper, they must engage the data, methodology, or assumptions of the paper in order to critique it.

judgment. Intangibles make the world of tangible inquiry possible. As Polanyi reminds us, both scientists and philosophers are culturally bound.

No individual, can hold, understand, and verify all knowledge.<sup>133</sup> Knowledge requires an a-critical foundation. A foundation formed out of the local culture, values and language. Polanyi is blunt in making this point. "To postpone mental decisions on account of their conceivable fallibility would necessarily block all decisions for ever, and pile up the hazards of hesitation to infinity. It would amount to voluntary mental stupor. Stupor alone can eliminate both belief and error" (1962, p. 314-315). It is high time - especially in a field as ripe with cross-disciplinary opportunities as kinesiology - that scientists and humanists begin to admit their codependence.

To understand human movement is intimately tied to both the process of scientific research and investigation of culture, meaning, and values, for they are born of each other. A personal commitment to the scientific life, and the discipline, training, and sacrifice it demands, is profoundly ethical. It is also for most profoundly meaningful. The scientific life requires the existence of intangibles. Such a commitment necessarily entails culture, meaning and values. In turn humanists rely on science to inform their understanding of reality.

Through the pursuit, design, and implementation of experimental and empirical

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<sup>133</sup> No person has the intellectual capacity or time to learn and verify all human knowledge. Likewise all inquiry, no matter how critical proceeds on the necessarily a-critical foundation. One cannot learn language without accepting its rules. One cannot accept the rules of language and critically analyze them at the same time. For the very concept of critical analysis is language bound. It is worth reiterating then, that skepticism cannot be an ultimate epistemic principle. "Strict skepticism should deny itself the possibility of advocating its own doctrine, since its consistent practice would preclude the use of language, the meaning of which is subject to all the notorious pitfalls of inductive reasoning" (Polanyi, 1962, p. 315).

research, science helps mold the process of philosophic inquiry. Scientific insights into, for instance, human anatomy should be a spur to wonder. Such insights also inevitably shape, constrain and inform philosophic thought regarding human nature, freedom, and movement.<sup>134</sup> Scientific research deeply implicates how humanists shape their inquiry into the human condition by opening yet unimagined vistas of meaning for exploration and description.<sup>135</sup>

Kinesiology is rooted in the human; in both physics and metaphysics, in values as much as in biology. To be an effective kinesiologist is to realize that time spent investigating either the sciences or the humanities, is time well spent. To be an effective kinesiologist is to understand that sub-disciplines rely on each other, that kinesiology scholars belong to a common fraternity.

I am convinced that such cross-disciplinary respect will only flower in departments that have adopted a holistic self-understanding.<sup>136</sup> This call to include human values, purposes, and meanings has all too often been neglected in departments of kinesiology. Yet, even when ignored, stewardship plays a

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<sup>134</sup> Understanding the anatomy and physiology of the human sexes, for instance, deeply influences philosophical arguments regarding the relationship and or complementarity of the sexes. Are men and women different? How and why are men and women different? What does it mean to say that men and women are different? What if any role does sex play in shaping thinking and behavior? How do men and women respond to exercise? Are men and women equally interested in exercise and sport? The pursuit of answers to such questions would be badly hamstrung without the scientific insights of anatomy, physiology, etc.

<sup>135</sup> This would pertain to both descriptions of reality, like general relativity, as well as technological breakthroughs like film, radio, or the camera that profoundly affect human experience and self-expression.

<sup>136</sup> For it is only within a holistic framework that a department can accomplish two vital goals. First holism allows for pride in the profession, and second holism asserts the vital importance of humanistic inquiry. Dualism allows for the second but not the first. Dualism takes humanistic inquiry seriously, but in quarantining and elevating the mind from the body, leaves kinesiology in a constantly defensive posture.

necessary role in human life. Today's kinesiologists are temporary caretakers of the discipline, a discipline they inherited, a discipline they will leave behind. Disregarding the role stewardship plays in human societies will not eliminate its reality. Human beings carry, for a little while, a torch left to them, that they - in turn - must leave to others.

“The social order was built, maintained, and left to us not just by a vague and nameless antiquity but by particular people, within living memory, whose serial deaths link us to the past. We receive the buildings they put together, the languages they spoke, the books they wrote, the ideas they had, the economic opportunities they made possible, the moral consequences of the things they did, the memories they left in us—just as others will receive ours” (Bottum, 2007, p. 24).

Kinesiology, no matter how much some kinesologists may try to ignore the fact, is not free of this historical reality. Only a naively whiggish<sup>137</sup> interpretation of the history of kinesiology, would assume that the present configuration of kinesiology is inherently superior to the past. Both progress and regress are possible. Kinesiology like any discipline is a philosophically and historically laden field. Debates regarding the nature and purpose of the field, as the work of Roberta J. Park (1980, 2005) clearly demonstrates, go back to the very founding days of discipline in the United States. As we have seen, the history of the philosophy of the human person is equally rich.

It has been my contention that two of the dominant philosophic commitments – the definition of *kinesis*, as well as the field's current

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<sup>137</sup> “Whiggish history” refers to the idea that history is necessarily progressive. Tomorrow is always better than today. Things are always getting better. The present moment is necessarily a culmination of all that came before it.

understanding of the nature of knowledge - are mistaken. Despite the progress these conceptions of *kinesis* and knowledge have allowed, they are incomplete descriptions of the phenomena. Both mistaken conceptions result from a misguided commitment to scientific materialism. Both, I have argued, have dire consequences for the field of kinesiology. Evaluating the merit of these claims requires, at a minimum, basic philosophic tools. Whether or not one ultimately agrees, one cannot make an informed and educated assessment if one has spent no time contemplating the fundamentally philosophic nature of kinesiology.

Philosophic arguments have been and continue to be employed in kinesiology. Therefore a well educated student of kinesiology must be conversant in the history and the philosophy of kinesiology. This, in turn requires at the least, an introductory engagement with philosophy and history as such. *Kinesis* engages the whole human being; for the human being is a being-at-work. Kinesiology departments, if they are to understand human movement, must also engage the whole human being!

A holistic conception of human beings plainly suggests that acceptance of these ideas will grow with time, rather than being a purely intellectual, overnight phenomenon. Consequently I don't advocate revolution, but rather propose a renewed respect for, and presence of, the humanities in the curriculum of departments of kinesiology.<sup>138</sup> This dissertation has been my attempt to begin

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<sup>138</sup> As William James put it *The Social Value of the College-Bred* (1907) "A small force if it never lets up will accumulate effects more considerable than those of much greater forces if these work inconsistently."

this process of growth and transformation by planting the seeds of reconciliation and mutual dependence. Clearly, such reconciliation will rely for support and direction on the current leadership of the academic discipline of kinesiology. It is my hope, that among those with influence, the need for change will be recognized. The inertia of the status quo will only be overcome deliberately.

## **Impact Area #2: Experience, Practice, Apprenticeship**

Kinesiology is too important, both as a science, and as an arena of meaningful human experience, to continue to blow around in the philosophic wind.<sup>139</sup> Kinesiologists must wake from their own self-induced philosophic slumber. The nature and purpose of kinesiology must be deliberately examined. The humanities give kinesiologists the tools necessary to see the full range of options and implications open to the future of the discipline. Only then will the fate of kinesiology be a reflection of the *deliberate* commitments of kinesiologists.

Such tools, as Polanyi so forcefully demonstrates, are only gained through apprenticeship and practice.<sup>140</sup> It is vital then that kinesiologists reject the materialistic claim that knowledge is a self-evident matter of “bare facts” that requires no skills, judgment, or adjudication. Kinesiologists must be willing to

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The ceaseless whisper of the more permanent Ideals [sic], the steady tug of truth and justice, give them but time, must warp the world in their direction.”

<sup>139</sup> I am convinced that such philosophic nonchalance will only lead to the continued fracturing of departments described by Roberta Rikli in her article “Kinesiology- A “Homeless” Field: Addressing Organization and Leadership Needs”.

<sup>140</sup> What is obvious to the scientist is missed by the laymen. What is obvious to the plumber is missed by the scientist. The master embodies knowledge that the novice does not. Apprenticeship and training literally opens up whole new arenas of knowledge. Through skill acquisition, the student learns to see what was unseen before.

stand up for the power of practical, inarticulate, and embodied knowledge.

“Know-how” is born of human experience and human experience cannot be entirely encapsulated by textbooks or procedure manuals.

Knowledge becomes under such a paradigm, a matter primarily of skills rather than theory. Skill precedes theory, and is born under the patient tutelage of a master. The student absorbs knowledge through emulation, and observation, as much as through explicit instruction. As a consequence, skill is central to knowledge. Because so much of what is learned is non-verbal, embodied non-verbal skills are not seen as illegitimate knowledge forms. As a result, physical education and kinesiology cannot be accused, on the grounds of being primarily “non-verbal” and “non-theoretical”, of being inherently inferior knowledge domains.

In the modern academy such a commitment requires courage. This is why I am convinced that the work of Polanyi and Aristotle - though their thinking cannot cure all that ails kinesiology- is so vitally important. They give kinesiologists alternative intellectual ground upon which to stand. Polanyi’s insistence on in-dwelling and connoisseurship as primary epistemic pathways creates a common foundation for all knowledge. Aristotle challenges the all too common materialistic presuppositions in kinesiology.

A new attitude towards experience and practice is possible. From this perspective knowledge is no longer seen as merely the impersonal accretion of the explicit and the measurable. Instead the importance of skills,



connoisseurship and the inarticulate take their rightful place at the foundation of knowledge. Expertise is a matter of growth. It is a matter of *kinesis*, a movement from ignorance to insight that requires time, effort, and trust. Expertise is a skill acquired by situated and historical beings in the world. Knowledge is an art *embodied in the personal skill of the knower*.

To become a scientist is more than merely assenting to the appropriate theories. It is to engage, soak up, and learn the techniques, perception, values, and intuitions of a scientist. It is to learn from and then become part of a community. Similarly in the arts, becoming a dancer is more than mastering the pronunciation of *plié* or *relevé*. A dancer must learn to embody the *plié*, *from which* they reach out *to* the rich world of self-expression offered through dance. Neither the dancer nor the scientist can see as much during their apprenticeship as they will upon achieving mastery of some of the central skills of the discipline. Both empirical observation and artistic expression are dependent on the development and refinement of skills. Such skills, such knowledge, literally move the knower. They are changed. They are liberated to do more, see more, and understand more than they had before.

As a result of this insight, the academy is democratized; both within the academy at large as well as in kinesiology departments. No epistemological ground exists on which to claim superiority for the sciences. Because of this, disciplines are no longer chastised or marginalized simply because they don't emphasize verbal, "mental", or theoretical knowledge. All fields rely upon non-

verbal, non-theoretical learning. Both kinesiology and philosophy become *full* citizens of the academy. Both biomechanics and sport history become *full* citizens of kinesiology because neither holds a privileged epistemological position.

It could of course be argued that although skills are central to all knowledge domains, the importance of some skill domains trump the importance of others. Is it not the case that kinesiology students should be more skilled at scientific research than that they are skilled at sport? Is it not clear that science is more important than sport?

In a general sense, there is much truth to this point. Certainly education is about learning *important* skills, and this mandates serious reflection on the question of “what counts as important?” This dissertation is intended to be part of that reflection. In part, I am arguing that good philosophical reflection on the nature and role of *kinesis* in human lives demands a reconsideration of the *importance* of supposedly trivial skills like “tennis.”

Implicit in such urging is the suspicion that the retreat from games, play, and sport is due – at least in part – to a faulty philosophic position that insists that only empirical knowledge domains are real or worthwhile domains, a faulty philosophic position that ignores the role of connoisseurship, belief, and skill play in the acquisition of knowledge. Let me say again, no *prima facie* epistemological reason exists for excluding inarticulate embodied skills from their legitimate place in the Academy.

Being highly skilled at tennis, may in some senses be inferior to being highly skilled at scientific research, but not in every sense.<sup>141</sup> Traditionally, the university has been dedicated – in principle if not always in practice - to respecting the breadth of human excellence. It is true that the exact nature of human beings and human excellence are matters of contention. It is also true that lines do need to be drawn. However, despite these difficulties, most academics have no trouble agreeing on the importance of the “renaissance” principle that overspecializing in one type of insight warps human development. Universities are (at least theoretically) in the business of creating good people not just good scientists... or good tennis players.

The recognition of the common role skill plays in knowledge domains should only deepen this holistic respect. Tennis, although it does not have the gravitas that scientific research does, is still a source of rich personal human meaning. Therefore “tennis” is not justified on the grounds that it produces important things, just as music, art, and theatre are not justified on the grounds that they *produce* important things. These practices are so fascinating and meaningful that they are justifiable and important in and of themselves. Such meaning is *intrinsically* valuable and should not be easily dismissed. Nor should the potential instrumental goods such skills provide be dismissed. Tennis

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<sup>141</sup> It is true that not all arenas of skill should be considered important on the basis of skill alone. Universities seem to rely on arenas of skill that contribute to “human flourishing.” Although the precise meaning of such a term is debatable, it should be clear that skill domains that harm human flourishing (by being cruel, sociopathic, or banal) would not be considered *important*. As Polanyi saw, adjudicating such distinctions is a matter of tacit knowledge, and personal judgment.

certainly has the potential to increase health, lower stress, and build community. Although at first glance this reasoning may appear insignificant in the face of scientific research that can cure disease and ease suffering, further reflection on the point suggests otherwise. As I have said elsewhere:

“Play is one of the reason humans want to live. In other words, we consider starvation, disease, and death bad things, only because we consider life worth living. But on what grounds is life worthwhile? I would argue that play is fundamental or elemental in nearly all of them. Joy, art, games, sport, humor, music, spirituality, are arguably all deeply informed by play or its implications” (2007, p. 208).

Of course scientific research is also often pursued on such meaningful levels.

The point is not to elevate tennis over science. Rather I want to point out that the intrinsic should trump the crudely utilitarian motivations that often underlie the claim that some skills are more important than others.<sup>142</sup>

Finally, it is worth remembering that one set of skills need not come at the expense of others. As I have been arguing, disciplines often interpenetrate, facilitate, and affect one another. The university should be dedicated to developing the whole person. Both science and “play” deserve an important place at the table in departments of kinesiology and in the Academy as a whole.

Aristotle is vital to this process of democratization as well. His work furthers the democratization of kinesiology. By arguing that *kinesis* is a far richer phenomenon than the mere dislocation of mass in space, Aristotle has laid a foundation for democratic inter-dependence in the Academy. *Kinesis* is a

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<sup>142</sup> “But to be constantly asking ‘what is the use of it?’ is unbecoming to those of broad vision and unworthy of free men” (Aristotle, *Politics*, 1338a45).

constitutive aspect of human life that penetrates our very being. Play, games, and sport are fundamental human activities. Careful observation clearly shows that although play and games are not the sum total of human life, they are an important and meaningful part of it. Furthermore, as Aristotle's ontological work also intimates, play and games are not mere *physical* activities but soul-filled human activities. The human being is a being-at-work, whose nature is revealed in *how* they are, not merely *what* they are. From the biology of metabolism to the desire for knowledge, *kinesis* allows for and serves the wholeness of human beings-at-work. Human beings are not mere machines. Studying them as if they were will never reveal a complete picture of human movement.

A department so democratized should see a clear decrease in tension between faculty members. For neither the scientists nor the humanists should feel (nor be treated) as if they are second class citizens. Furthermore kinesiology faculties should be more confident of their place in the larger academy. This would be most evident with pedagogy faculties who have been so bombarded with criticism from all sides that they habitually retreat to utilitarian self justification. Such departmental harmony would allow for a unified and unapologetic defense of kinesiology in the academy.

If human beings are more than machines, if physical activity is more than mere "body time" but rather engages the whole human person, then physical activity is defensible for reasons other than stock utilitarian grounds such as

“reducing obesity.” Within a holistic framework, the importance of physical activity is deepened. It is no longer merely a means to an end; it is also an end in itself. It is part of the good life. In observing human beings it becomes clear that locomotion is a fundamental form of human *kinesis*. Physical education classes, when done well, profoundly impact students as people. Running, jumping, kicking and throwing, are intrinsically meaningful human activities, and should be treated as such without apology!

If skills, apprenticeship, and practice are at the roots of human knowing, then physical education and kinesiology are - insofar as they teach skills - a legitimate domain of human knowledge. Athletic and recreational skills are no less significant than the skills of the arts or sciences. To be a physically educated person is to live in a richer world, a world full of experiences, opportunities, and environments that are unavailable to the uneducated. The quality of life of a child is clearly threatened by illiteracy. So too a child’s quality of life is threatened by kinesthetic illiteracy.<sup>143</sup>

Therefore, kinesiologists and physical educators should demand that activity classes are graded on performance not just effort. To grade on “effort” or “participation” is to indicate to both students and the larger academy that the

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<sup>143</sup> The most obvious content area in which to develop such literacy, as well as the one most historically associated with physical education is that of games, play and sport. While the case could be made that games, play, and sport are not the necessary province of physical education, such recreational and athletic activities are important human activities and would therefore (especially after being buttressed by Aristotle and Polanyi) seem to be worthy of academic study. Why would kinesiologists, of all people, want to distance themselves from games, play, and sport? Are they not our “pearl of great price”? If games, play, and sport are not, what is?

subject matter is in fact trivial, that skill and knowledge in this particular domain are in fact optional. It is to concede that the physical education is not real education. If physical education matters, if physical education makes for a better life, if human beings are beings in the world, then it is important to learn how to perform well – that is, skillfully- at activities that have been and continue to be important to people! <sup>144</sup>

Such a re-commitment to the role of skill, apprenticeship, and experience could also facilitate the growth of cross-disciplinary research in kinesiology. If the sub-disciplines of kinesiology are built on the same foundation, and if the sub-disciplines of kinesiology actually cross-pollinate each other, then cross-disciplinary research is not only politically advantageous, but may actually be a key to deepening the efficacy of research within the discipline.<sup>145</sup> The answers to many research questions are likely to spill across sub-disciplinary boundaries.

The insights of Aristotle and Polanyi should help kinesiologists see value in areas outside their own realm of expertise. It should also help kinesiologists embrace a broader conception of knowledge and research. This would directly

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<sup>144</sup> The typical counter-arguments that not all children are athletic, or that not all children like “sports” are unpersuasive. Not all children speak well. Not all children are good with numbers. Not all children read well. Not all children like Shakespeare. Not all children enjoy history. Yet we make children study Shakespeare, we make children study history, and we make children master mathematics and reading because we believe the basic mastery of such material is important; even in cases where there is no practical or useful application for the material. (Few job applications quiz applicants on the whether or not Hamlet had an Oedipal Complex. Yet school districts and universities around the country continue to insist that studying literature matters.) Likewise, to complain that students don’t need to master “basketball” because demonstrating competence at “basketball” is an “arbitrary” and “accidental” measure is not convincing. The same could again be said of Shakespeare. We don’t ask students to study “literature” absent of specific content, nor should we ask them to study “physical activity” absent of specific content. Basketball and Shakespeare are contingent only in the way that the entire culture is contingent.

<sup>145</sup> See Kretchmar (2007), “What to do with Meaning: A Research Conundrum for the 21<sup>st</sup> Century.”

affect the hiring and tenure process. If skills, particularly non-verbal skills are essential to knowledge, then they should also be considered as valid academic qualifications in sub-disciplines built on cultivating those types of skills. If an artist can receive tenure by demonstrating mastery of a particular medium, why should a pedagogist (who is in the business of teaching skills, just as the art professor is) be evaluated on the basis of empirical research alone? It would seem that in pedagogy, there should be other relevant measures of scholarly output besides traditional research, such as skill mastery, and teaching ability. To demand that a pedagogist, who is in the business of teaching, must master empirical research before being taken seriously as a scholar is to misunderstand the nature of knowledge. It is to deify “knowing that” and to undervalue “knowing how”. It follows then that kinesiology departments should consider, where applicable, a broadening of the scholarly evaluation of faculty.

Although kinesiologists should be generalists in spirit, who respect the insights and research methodologies of the other sub-disciplines of kinesiology, there are important reasons to insist on continuing the practice of specialization within field. If mastery of skills is central to attaining knowledge, and if apprenticeship builds skill over time, then specialization is vital in higher education. Connoisseurs are not generalists. Mastery requires specificity.



### Impact Area #3: Specificity

Reflecting on the nature of connoisseurship indicates the inadequacy of abstract definitions of the field's core such as "physical activity"; at least insofar as these definitions are a retreat from, or are uncomfortable with, the specific activities that actually make up the field.<sup>146</sup> To be committed to "movement" absent of content, is a function of rationalization; be it political, educational, or ontological.<sup>147</sup> A passionate commitment to "movement" is impossible, just as a passionate commitment to "humanity" is impossible. One cannot love all people "without first loving particular, individual humans" (Twietmeyer, 2007, p. 206).<sup>148</sup> No one is passionate about, nor an expert in, "movement," nor will one ever be.<sup>149</sup> If kinesiologists are going to be passionate they need to have something tangible around which to rally. Passion is a function of relationships. Passion is a function of holding something valuable in common. Knowledge, as

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<sup>146</sup> I remain convinced that "play and games" is the best description of the "physical activities" that make up the field. Obviously play and games would encompass such things as dance and "exercise." Likewise under such a definition, scientists could research related or abstracted questions such as rehab or robotics. Yet such research must be in service of something specific, or "kinesiologists" have no need to be together. Departments of kinesiology become matters of convenience, and are nothing more than bureaucratic institutions.

<sup>147</sup> By political rationalization, I mean that "movement" sells better. By educational rationalization I mean simply that play, games and sport are often accused of being both non-academic and childish, while movement sounds serious and scientific. By ontological rationalization I mean something similar. This type of rationalization claims that sport is ontologically insufficient because it is merely a "body" activity. Given such assumptions, abstraction makes perfect sense.

<sup>148</sup> To say that one loves movement, but finds no appeal in any particular type of sport or exercise, is like saying "I love humanity, its individual people that I can't stand!" One never encounters humanity; one only encounters individual human beings.

<sup>149</sup> "Likewise, we rarely hear anyone say that they have fallen in love with movement. I'm not even sure what that would be like! But we do understand people who say they are golfing fanatics, skiing enthusiasts, distance runners, or that they fell in love with table tennis" (Kretchmar, 2008).

we have seen, relies on apprenticeship and community. It relies on time and devotion. To be an expert is to dedicate one's attention to something specific. Specificity then, not abstraction, should be kinesiology's mantra. A core, if it is to have any gravitational pull (unity, inspiration, passion) needs specific content.

Despite the real weaknesses of abstraction, such thinking, as we saw in chapter one, dominates kinesiology today. There are two commonly used objections to the claim that a more specific core such as "games, play, and sport" is better for kinesiology than more abstract definitions of the core. First, following Newell (1990a, 1990b, 1990c, 2007), critics of specificity argue that "games, play, and sport" is too narrow of a definition. That it excludes too many activities that should be a part of kinesiology. Furthermore, the critics allege that such a narrow focus would stunt research opportunities by all but eliminating theoretical research in the field. Instead the kinesiological sciences will be limited to applied research that only investigates sport related phenomena.

Second, it is charged that moving away from play, games, and sport is politically advantageous. Games, play and sport do not sell well, particularly in the Academy. More "academic," more abstract names and titles like "kinesiology" and "physical activity" give the field much needed respect, and make the procurement of scarce resources in higher education that much easier to achieve.

Regarding the exclusion of activities, it must be admitted that some physical activity is and should be excluded from departmental and school

curricula. It makes no sense to be all things to all people. It is philosophically and practically impossible. If that is the case, what then is our *core*? Play, games, and sport, though still abstractions, though still problematic, seem to be the most honest and accurate representation.

It is both practically justifiable and philosophically consistent to say that surrounding that core would be other similar and culturally resonant physical activities such as exercise, and dance.<sup>150</sup> The point is to focus on the centrality and intrinsic importance of the activities themselves. The inter-relationship between, as well as the fundamental importance of these activities *-in their various particular forms* - is clearer the more specific the core is.

Similarly, more abstract terms such as “physical activity,” or “movement” would not be banished from kinesiology. They would simply move out a few layers (or rings) from the core of the discipline. Although still deeply important concepts in the field, their importance would be moderated by the fact that most of the time “physical activity” and “movement” are lesser descriptions than “play, games, and sport”, of the actual practice of skilled *human kinesis* in the discipline of kinesiology.

Although describing the core as play, games, and sport is imperfect, it is far superior to the ambiguity of “physical activity” which seems to suggest, in its very ambiguity, that particularity, human experience, and human culture are

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<sup>150</sup> Adjudicating such distinctions should be the business of kinesiology faculties themselves. Making such distinctions becomes easier the more concrete the core is.

insignificant concerns for kinesiologists.<sup>151</sup> Such ambiguity also implies that what *really matters* is the abstract, the generalizable, and the measurable.

A commitment to “physical activity” seems indifferent to the content and context of the activities that make up the core of the field. In contrast, though “play, games, and sport” might not hit every descriptive nail in the field on the head, they undoubtedly hit three of the most important.<sup>152</sup>

Let us consider the alternative scenario. To call kinesiology’s core “physical activity” leaves open for potential study, every single activity a human person engages in. How is this preferable? When the core is defined as “physical activity,” direct associations between kinesiology and sport, recreation or exercise, are left with only two possible explanations. Either an association between kinesiology and sport is implicitly taken for granted though never actually justified by the terminology; or in the name of logical consistency, the relationship is explicitly reduced to contingency, a historical anachronism.

Neither situation is healthy. The first is too precarious, for it lacks any philosophical justification of the relationship between kinesiology and sport. If the relationship is in fact solid, then why play word games when describing

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<sup>151</sup> Nor is the ultimate logical insufficiency of “play, games, and sport” unique. It is true that a core defined as “play, games and sport,” cannot exclude chess or monopoly from a literal interpretation of the core, but neither can a literal interpretation of art exclude quilting or fashion design or carpentry from its core. Similarly everyone knows what physical education is, even though the term itself is - if taken literally - overly broad.

<sup>152</sup> I am convinced that “physical activity” has been accepted as the core of the field - in the name of inclusion- despite the fact that it aims at, and hits no nails on the head. It is of course true that the type of specificity I am proposing, if it were to avoid a sense of insular self-superiority and chauvinism, would need a broad, outward looking disposition.

the core? The second scenario is born of this ambiguity and acts like a cancer slowly consuming and destroying a once healthy relationship between kinesiology, sport, and exercise. This cancer will not ultimately be satisfied by the mere concession of contingency, for a contingent relationship is, after all, an unnecessary relationship.

Therefore, I fail to see how an ambiguous core that constantly requires cutting away the largess of its own ambiguity is healthier than having a specific, but not all-encompassing core.<sup>153</sup> This is particularly true when the field of kinesiology seems to be on the verge of disintegration (Rikli, 2006). How exactly will “physical activity” hold kinesiology together? How well has “physical activity” held kinesiology together? If physical activity is such powerful glue, why do so many fractures and fissures in the field remain?

Although it is linguistically clumsy - given the limitations of squeezing all the different types of meaningful movement forms into the definition- confining the core of kinesiology to a specific target such as “games, play, and sport,” is far superior to the muddle created by an overly broad definition. Although such language will no doubt be read by some as harsh, the intention is pluralistic. Yet the hour is late - particularly for the humanities - and blunt talk is needed. Kinesiologists must lay their cards on the table; how and why do we belong together? What is it that *we* as kinesiologists believe? What is kinesiology?

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<sup>153</sup> It is better to be precise if slightly inaccurate, than to make both accuracy and precision irrelevant by making the target so big that any physical activity hits the bull’s-eye.

How is *kinesis* to be understood? How should the *human* in human movement be understood? I believe the answer to all these questions point in the direction of defining the core specifically.

If one turns their attention to the question of research, I concede that the scenario as painted by critics would be lamentable, but I see no necessary relationship between defining the core as precisely and honestly as possible, and an insistence that research within the discipline must be strictly limited to “applied research.” Nor do I see why it would have to be strictly tied to sport. Why must a specific core mandate research rigidity?<sup>154</sup>

Scientific concerns are, as Polanyi insists, born of human concerns. I think then, that it is not a coincidence, nor a source of shame that biomechanics and exercise physiology have grown up in gymnasia. The location of kinesiology departments in gymnasiums and recreations buildings should not therefore be seen as a historical anachronism, or as an embarrassment in need of remedy. A specific core should both bind us together and be a source of inspiration; it should not be a source of heavy handed restrictions.

Play, games, and sport, under my paradigm would be the core, not the sum total of kinesiology. A core, if it is to be of any value, needs to be part of a whole larger than itself. Certainly sport has spurred, and will continue to spur

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<sup>154</sup> One speculative answer for the resistance to specificity is that ambiguity makes it is easier to recruit “big-time” or “name” faculty to a kinesiology department. A department centered around an abstract core like “movement” instead of “sport” is an easier sell, especially to scientists who do not have a background in kinesiology, but who may be a potential source of grant money and prestige. In that sense, it may be the tail (Research Universities) that is wagging the dog.

research into more abstract questions of gait, posture, motor control and learning. It is also certainly the case that once more abstract questions have been raised new inquiry can begin, *at that level*, without “offering sacrifices at the altar of sport.” However, although scientists are free to pursue theoretical research without any direct application to games, play, or sport, scientists in kinesiology should not be ashamed of the central role games, play and sport, play in their departments.

A specific core if embraced in a spirit of intellectual inquiry rather than doctrinaire conformity would not threaten such research. Theoretical research can and should be welcomed in a field whose core is games, play, and sport. It makes perfect sense to allow scientists and humanists the freedom to investigate phenomenon as best they see fit; independent of a direct and immediate sport application.<sup>155</sup> Yet such research would all be done in relationship to a core that is specific; games, play, and sport. Theoretical research would be done within a larger context.<sup>156</sup> Theoretical research, free to pursue its own questions, would orbit around a specific core.

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<sup>155</sup> Athletic Trainers are free to research the nature of respiration or necrosis. Sport philosophers are free to investigate the nature of the human person. Exercise physiologists are free to investigate how oxygen consumption changes as we age. Another way to consider this point is within the context of sports themselves. Baseball players can lift weights and still be baseball players. Teams can employ strength and conditioning coaches, nutritionists, statisticians, and business managers, without redefining or hiding the core nature of the enterprise.

<sup>156</sup> It is worth remembering Polanyi’s point that all research, no matter how theoretical, is done within such a context. Scientists investigate what matters to human beings, what they find intriguing, what they believe will bear fruit. “For, as human beings, we must inevitably see the universe from a centre lying within ourselves and speak about it in terms of a human language shaped by exigencies of human intercourse. Any attempt to rigorously eliminate our human perspective from our picture of the world must lead to absurdity” (1962, p.3).

If, however, it is charged that theoretical research must be entirely free of a relationship to such specific content, then there is no need for the disparate sub-disciplines of kinesiology to be together in any type of department at all. If that is the preferred scenario, how then is the danger of “exclusion” any greater than the danger of “inclusion”? How can kinesiologists – when under such an inclusive paradigm – honestly adjudicate which sub-disciplines actually belong together? Furthermore on what grounds could they defend these choices? Although some scientists may consider my proposal stifling; I do not see how kinesiology can survive with a core so abstract that it leaves kinesiologists with essentially *nothing* in common.

In the event that “inclusion” continues to be the dominant philosophy of kinesiology, I am convinced that the continued dissolution of kinesiology departments will be the inevitable result. The only possible alternative –at least conceptually- is to transform departments of kinesiology into colleges of kinesiology. Such a college would have both humanistic and scientific departments that would be free to research the nature and value of human *kinesis* as best they see fit. Two very real drawbacks exist for this solution however. First, the likelihood both politically and financially of such a transformation is dubious at best. Second, what would happen to the burgeoning recognition of inter-disciplinary codependence in a *school* of kinesiology? Would not the sub-disciplines be further isolated from one another? For the time being at least, it appears that kinesiologists must learn to live with and respect one another.



Although political concerns should not be ignored, it seems naïve to think that purely political solutions to kinesiology's problems are possible. In the end, the critics of physical education and sport take issue - right or wrong - with more than the field's nomenclature. Following from this insight, a disturbing question must then be asked. Are kinesiologists moving away from sport in search of academic respect, or are they moving away from sport because they agree with the critics that "sport" is a trivial, non-intellectual, and childish domain? Unfortunately, I think that the answer is both. Yet, as I have tried to articulate in this dissertation, it does not have to be this way. If kinesiologists learn to engage the philosophic foundation of the discipline, they will see principled grounds upon which to stand and defend themselves. They will see that there are grounds upon which to defend the intrinsic human importance of play, games, and sport.

The current strategy of accommodation makes little sense. It will lead either to disintegration, as disparate and unrelated sub-disciplines slowly break free of their purely bureaucratic bonds, or it will lead to a department so blurred in purpose that it bears no resemblance to its historic roots, departments in which there will almost certainly be little or no humanistic presence. As I have tried to demonstrate, a department of kinesiology dedicated to only the scientific aspects of kinesiology is incapable of fully understanding human movement.

Therefore, I am convinced that a field dedicated to "physical activity" cannot long endure. A field that has no common purpose, a field whose faculties

are related on essentially bureaucratic grounds, will not survive in any recognizable form. Perhaps that is exactly what some of the proponents of abstraction want. Yet, if that is the case, then disintegration is not only inevitable but also advantageous.

Therefore, maintaining the status quo is not a sufficient solution. The slow but steady transformation of kinesiology into a purely scientific field will lead to the same end result of disintegration, with everyone going their separate ways. The only difference is that scientists would keep the name kinesiology for a newly exclusive field.<sup>157</sup>

Yet where do games, play, and sport belong if not in the field of kinesiology? Sport is a ubiquitous part of human culture. How can the field be called the “study of human movement” if culturally resonant and historically important aspects of human movement are glossed over or worse yet, excluded from the field?

Although specificity regarding the core nature of kinesiology is needed, there is no need to re-ignite the name wars. Kinesiology is a fine name for the field, and there is nothing wrong with gaining politically from the name change. In fact, as stridently as I have argued for “games, play, and sport”, I would be comfortable with “physical activity” remaining the name for the core *if the philosophical underpinnings behind such abstraction shifted in the directions I have proposed*. “Physical activity” must be seen as *human* activity not *physical* activity.

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<sup>157</sup> One can see, in the imagined scenario, how a deep and abiding commitment to “inclusion” often leads to exclusive results.

Human beings must not be seen as machines. The soul must be recognized.

Specificity must not be seen as an inherent vice. Motion must be seen holistically as a fundamental and meaningful aspect of *beings that value, perceive and desire*.

Knowledge must be understood as more than bare empirical facts. Embodied skills must be *celebrated* rather than tolerated or denied.

Problems arise however when the motivation for name changes and ambiguity is shame. It is for that reason that I have argued for a reevaluation of what the term kinesiology means. *Kinesis* is far richer and more important than most kinesiologists have ever imagined. Human locomotion is the source of incredibly meaningful human activity. It is a part of what it means to be a human *being*.

It is again worth pointing out the value of such meaningful experience. It is again worth reiterating how that meaningful experience embraces rather than shuns specificity. "Sliding into second base just ahead of the tag", "running to daylight", and "catching your second wind" are never experienced as abstractions, or theoretical injunctions. They are not functions of "movement" but functions of baseball, football, and running. They are experienced in the rich, sensual, and value laden world of time and space. These experiences engage us as people, not mere bodies.

Play, games and sport, among other wonders, make our often troubled and painful lives, just a little bit brighter.<sup>158</sup> These specific experiences create passion. They give us one more reason to affirm the goodness of life. More importantly for kinesiologists, they give us reason to affirm the goodness of our field. As Polanyi argued, human beings are “carried away” (1975, p. 73) by such experiences. We dwell in them and they become part of who we are. Passion is best developed through actual experience; through direct engagement with the activity itself.

Polanyi’s re-conception of knowledge and Aristotle’s holistic ontology allows kinesiology to develop backbone and pride, about the meaningful nature of the field without *needing* to hide behind abstraction. This should allow kinesiologists to focus on the intrinsic value of “mere games” without immediately retreating to utilitarian justifications when attacked. Sometimes it is good to be *good for nothing*!<sup>159</sup> Polanyi was fond of saying that the more meaningful something was the more real it was (1975). Games, play, and sport certainly bear the mark of being meaningful. The people who should know this best must start standing up for their intrinsic worth.

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<sup>158</sup> The point is not to say that “sport” is *the thing* that gives meaning to our lives, but rather to get a place for “games, play and sport” at the table. Certainly there are myriad other human arenas that move people just as profoundly including, literature, art, music, theater, dance and religion. It also true that science, when pursued in a spirit of wonder, can have much the same effect.

<sup>159</sup> Just as Shakespeare, Van Gogh, Beethoven, and my wife’s new favorite, Jane Austen, are not justified on the grounds of utility. Similarly, the confidence with which I hold Shakespeare in high regard makes me functionally immune to criticism; i.e. it is the critics’ loss not mine. Kinesiologists *should be* in the same position but with a different yet no less fascinating love.

## Impact Area #4: Activity

To that end, I am convinced that the requirement of “activity classes” at all levels of study in kinesiology, even graduate study, is justified.<sup>160</sup> We must learn to *show* why we matter, by embodying and cultivating the actual practice of specific and meaningful movement forms. As both Polanyi and Doug Anderson argue, academic arguments can never fully carry the day. For such arguments are by nature incapable of expressing the visceral appeal of the activities themselves. To truly understand the argument in favor of kinesiology is to have already “dwelt-in”, the type of specific movement form(s) that have given rise to this academic field. As Anderson reminds us, “This good [the importance of gym class] cannot be argued nearly so well as it can be felt in the actual experiences of moving” (2002, p. 93) This type of direct experience encourages kinesiologists to stand up for themselves and remain confident even in the face of criticism and scorn. Because what they profess *has actually changed and improved their own lives*. Such insights are only found, however, in the actual practice of moving.<sup>161</sup>

These “movement” experiences are embodied as well as specific, both to time and place, and the type of activity. As we saw in chapter two, human beings are not indifferent to place. Commenting on Aristotle’s understanding of place, philosopher Nathan Anderson insists that, “Unlike geometrical spaces, places are

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<sup>160</sup> I am unconvinced by the counter argument that most “students are already doing it.” Undergraduates are already writing, and yet we require them to take writing intensive classes, because the academy values and emphasizes the importance of writing well.

<sup>161</sup> Anderson makes the same point when states “The meaning of movement must be *had* as well as be learned about” (2002, p. 92).

not indifferent to that which they contain. Indeed they seem to have a kind of power” (2004, p. 5). These movement experiences are lived in the world and are enhanced, or hindered, by the places in which they occur.

They are a *specific interaction* between a locale and the human beings in that place. Similarly, these experiences are not indifferent to skill, tradition, or community. In fact as skill is built the dynamic relationship between place (playground) and that which it contains (the player) can itself change. A long-term, committed engagement with baseball, or karate, or swimming, will grow skilled players. This type of dedicated relationship between a player and a playground liberates people, by freeing them to experience skillfully, a domain in which they were previously unskilled, clumsy, or even afraid. As a consequence, both the player and the place have changed (Kretchmar, 2005).

It follows that understanding and defining the core of kinesiology may ultimately be best served not by reformed terminology (though that is important) but rather by a renewed commitment to active participation in the *particular* activities themselves. It is the practice of skilled physical activity that will hold the field together. “If there is to be a new passion for the profession,” Doug Anderson declares, “I think it must come from the perennial heart of its studies, from reawakening to the experiences of movement” (2002, p. 95).

It is this insight that in part explains my commitment to defining the core specifically; passion is generated through the skillful practice of individuals engaged with specific types of physical activity. Although games, play, and sport

don't encompass all of these activities, they do openly embrace the importance of practice; by better specifying the types of activities, whose individual –that is, specific - practice should be at the core of the discipline.

What would this requirement of activity look like? Certainly I do not intend to eliminate theoretical work from the field. Rather I mean to emphasize that the requirement of physical activity such as games, play, and sport, by both graduate and undergraduate students, would remind everyone in kinesiology that they are researching, learning, and theorizing about something in the real world, something that deeply matters to human beings. Something that is so powerful that such experiences with particular movement forms have been described as transcendent (Berger, 1969), (Herrigel, 1981). Because of the power and importance of the actual practice of physical activity to the field, it only seems appropriate that the next generations of kinesiology's leaders are exposed directly -within the confines of their programs - to the wonders of moving well.

Theoretical research in kinesiology is vitally important, but such research needs a target. Therefore although graduate students who are majoring in research heavy disciplines should not be turned into generalists, a basic but serious engagement with the actual practice of physical activity should be required. Programs that adopted such a recommendation would not be changing their curriculums radically; they would simply acknowledge the centrality of

practice, by requiring an activity class or classes as part of their program.<sup>162</sup>

Because of this requirement, sport philosophers would not be free to leave their heads in clouds, moving only for the sake of scratching their chins while in deep contemplation, nor would scientists be free to hole up in their labs, examining the physiology, anatomy, and mechanics of such movement only through microscopes, cadavers, and theoretical models. Contemplation and scientific research are no doubt important to kinesiology, but they are not the core of kinesiology.

Rather than being ever-penitent regarding activities such as sport, kinesiologists must instead be proud of such specific movement forms. Kinesiologists should jealously guard them as the treasures they are. Being associated with games, play, and sport is a privilege not a burden. The practice of specific movement - whether exercise, play, or dance - should no longer be feared as *prima facie* evidence of "exclusion"; as if exclusion was by nature a bad thing. Engagement with the specific is one of the best ways to come to theorize about the general. To stand for everything is in actuality to stand for nothing. Polanyi clarifies this point beautifully regarding religion. "These must of course be specific rites and myths - not just rites and myths in general. There are no such things. Religion 'in general' is thus not religion, just as language in 'general'

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<sup>162</sup> This would be above and beyond any activity requirement that may be mandated by a college or university's general education requirements. The lack of such requirements in many kinesiology departments reflects on their own sense of self-respect. English departments after all do not consider the requirement of a general education requirement in English Composition as sufficient engagement by their students with the activity of writing well. Instead they have additional requirements - within their own departments- because engaging the English language is at the heart of who and what they are.



is not language. To be religious we must have a religion” (1975, p. 179). It is just as true of kinesiology. Movement in general *is not kinesiology*.

I am convinced that “in-dwelling” in this way is the key to a passionate and engaged department that has a sense of common purpose, and respect for one another.<sup>163</sup> As many voices, and as many viewpoints, and as much experience as possible is necessary in the continuing struggle to articulate, understand, and embody the amazing human phenomenon that kinesiology is charged with professing. We must grow our understanding of what we should be preaching as kinesiologists. Such preaching will never flower however if not rooted in the actual practice of the “games, play, and sport”, call it what you will, that so fascinate humans, and of which we as kinesiologists are so mysteriously ashamed.

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<sup>163</sup> As Polanyi wrote in *Meaning*, “We must not forget, that our over-all task in this inquiry is not simply to develop, on a sound epistemological basis, the semantics of the artificial coherences discovered (or created) by man – as if this were a cool, professional, academic task – but to produce, in a manner akin to art, a new moving vision of the world, imaginatively richer in the scope of its integration of disparate parts than those we have heretofore been offered by our scientific myth-makers” (1975, p. 107).

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## Vita

Gregg Twietmeyer was born in 1975 in Iowa City, Iowa, where his father T. Alan Twietmeyer was finishing his Ph.D. in Physical Education at the University of Iowa. Gregg received his bachelor's degree in Art from Concordia University-Ann Arbor in 1997. While at Concordia Gregg worked in the Athletics Department, played varsity soccer, and worked at Concordia's Summer Sports Camps. Gregg then spent five years working as a graphic artist. During this time he also coached high school soccer, and designed the website for the Wolverine-Hoosier Athletic Conference. These experiences foreshadowed his interest in tacit knowledge, apprenticeship, and inarticulate communication.

Gregg returned to graduate school to pursue a M.A. in Sport Management at the University of Michigan in 2002. This shift was literally driven by Gregg's desire to *move*. Although the creative aspects of graphic art were enjoyable, being sedentary for eight hours a day became tedium. After graduating from Michigan in 2003, Gregg worked for a year in the Athletics Department at Albion College.

In the fall of 2004, Gregg began his Ph.D. studies in History and Philosophy of Sport at Penn State University, under the tutelage of Dr. R. Scott Kretchmar. While at Penn State, Gregg presented papers at both the International Association for the Philosophy of Sport and the North American Society for Sport History. Some of his other areas of research interest include play and play experience, the mind body problem, virtue ethics, and the relationship of theology and sport. Since January 2008, Gregg has been employed as an Assistant Professor of Sport Management at Marshall University in Huntington, WV, where he teaches sport philosophy and sport history. He resides in Huntington with his wife Sarah, and two sons, Aaron and Luke.