Chapter 1

A Science of Leadership

§ 1.   Defining Leadership: The Issues

What is leadership and who is a leader? These are the sorts of questions that upon first encounter most people are confident they can answer but which turn out to be not so easy to understand as is first supposed. As we dig beneath the surface in attempting to understand at a deeper level what we might call "the essence of leadership" the first thing we run into is a diverging number of quite different connotations for the term "leadership." Which, if any, of these divers meanings takes us to the fundamental understanding we seek? Which, if any, of these connotations will bring us to a point where we can make practical use of the idea for beneficial and fecund purposes such as finding out if leadership is a human quality one can develop or improve and, if so, how? We seek, in other words, an understanding of leadership and leader in order that we might make real and consequential use of these ideas. Any theory that cannot be reduced to practice is rightly called *useless*, and your author presumes you, my dear reader, have better things to do with your time than squander it on useless pursuits.

The philosopher Kant taught that a ***real definition*** is a practical definition by which the object being defined can always be recognized and that makes the concept of the object usable in application. We seek the objective real definition of leadership in this treatise. A real definition is usually not at all the same thing as a dictionary definition. In every human language words have a tendency to grow soft and ambiguous over time by picking up metaphorical and allegorical usages. If the word has been around long enough, it ends up being a mere symbol with divers applications. It acquires usages that can contribute to *mis*understanding as often than they contribute to understanding. In English the word "leadership" has two dictionary definitions:

> **leadership**, *n*.   1. the position or guidance of a leader.
>   2. the ability to lead.

These are the common *connotations* from which we seek to understand the *real* idea of leadership. Can we take either (or both) of these definitions and from them recognize leadership when we see it or accurately use the idea of leadership in some concrete application? A bit of reflection ought to show us that we cannot, that these definitions are not sufficient for these accomplishments, and that, therefore, what we have here are *not* real definitions of leadership. It is the real definition we want and so our inquiry cannot be satisfied merely by looking in the dictionary. At best the dictionary definitions provide only a starting point for inquiry and an orientation for the direction this inquiry is to take.

The first of these two dictionary definitions actually contains not one but two connotations and these are not manifestly the same. The first connotation, the position of a leader, is merely the name of an office. It is a title or designation for a person or thing either possessing or expected to possess the ability called for in the second definition. This first connotation is strictly nominal. So long as we have a convention for understanding what or who this identifier points to, it makes no real difference if we denote "the position of a leader" by the term "leadership" or some other coined term, e.g. "Pooh-Bah-ship." We would not be concerned with this connotation were it not for the fact that the word "leadership" in the context of *human* leadership is often misapplied and used to denote a *person* such as "the boss," "the manager," or "the supervisor" regardless of whether or not this person (the Pooh-Bah) actually leads other people. The figurehead doesn't really lead the ship.

The second connotation, the guidance of a leader, means that-which-the-leader-provides ("the guidance") and is an idea of a *relationship* of some kind between a person designated by the term "leader" and one or more other persons called *followers*. Strictly speaking, this applies to *human* leadership. Because this treatise is not concerned with any other kind of leadership, we will hereafter understand the abbreviated term "leadership" to mean "human leadership." We will not be concerned with analogy-based usages such as calling the alpha male of a pack of wolves "the leader of the pack," a town council "the community leadership," or a governor "the state's leader."

In this second connotation the leader is the provider of something ("guidance") provided to *and made use of by* another (the follower). Here "leadership" is used as merely an English synonym for "guidance" within one specific context. The advice provided by an advisor is a species of guidance but this species is not generally what one means by the word "leadership." What, then, is specific about "the guidance of the leader" such that this guidance is called "leadership"? To ask this is to ask "what is its nature?" and to study the nature of something with discipline is called *science*.

Is guidance a consequence or outcome of "leadership" (as understood by the second dictionary definition)? If it is then that implies the second dictionary definition is somewhat more primary inasmuch as some *ability* is the *source* of the guidance. And if it is not then what is it? It seems clear enough that we need to understand what-is-provided before we can hope to have much chance of understanding whatever-it-is-that-is-doing-the-providing. Does "the guidance of a teacher" mean something *essentially* different than "the guidance of a leader"? If so, what is this difference?

Here we would do well to heed a note of caution provided by Aristotle. He wrote,

> Things are homonymous when they have the name only in common and the definition of being which corresponds to the name is different. For instance, while a man and a portrait[1]

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[1] The Greek word ζῶον had two usages: (1) the living creature; and (2) a figure or image in painting, embroidery, or sculpture. This homonymous usage does not occur in the corresponding English noun.

> can properly both be called 'animals,' these are homonymously named. For if one is to say
> what being an animal is for each of them, one will have to give two definitions. – Aristotle,
> *Categories*

Languages, and English not least of all, frequently develop usages for words in which one word ("leadership" in our case) is employed in place of another ("guidance" in our case) and custom then comes to regard this substitution as the employment of a synonym. We have done so above by saying leadership is being used as a synonym for guidance in the second connotation of the first dictionary definition. Aristotle would rebuke us for this practice and accuse us of making a homonymous use of the word "synonym":

> Things are synonymously named when not only they bear the same name but the name has
> the same definition corresponding in each case. Thus a man and an ox are called 'animals.'
> The name is the same in both cases and so also the statement of essence. For if you ask
> what is meant by their both of them being called 'animals,' you give that particular name in
> both cases the same definition. – [*ibid.*]

When we *employ* words homonymously while *thinking* we are employing them synonymously the usual effect is to open the door to sophisms and misunderstandings. This is the case in using "leadership" to mean "the guidance of the leader." Above it was asked if "guidance" is an outcome or effect of leadership or if it could be something else *essentially*. Is there a *real* reason to think the idea of guidance-that-is-not-a-consequence-or-outcome-of-leadership is anything but an empty idea (an empty idea being an idea that has no real and practical meaning and is just a symbol for some ontological illusion)? If it *is* empty it is nothing more than the philosophical equivalent of a ghost and of no practical use except perhaps in child's-play-philosophy or obtaining government grants. And if this is the case, we'd better know that this is the case.

Now let us turn to the second dictionary definition, "the ability to lead." "To lead" is a verb, which means the concept of "to lead" denotes an action of some kind. Leadership, then, seems to be an idea that denotes either: (1) an ability to perform such an action; or (2) the guidance by or from which *another* person is able to perform some action. The first is a *practical* ability of some kind and the idea of leadership must, in this connotation, be a practical idea in its root *real* meaning. It would follow from this that "leader" is the idea of a person who not only possesses but actually does *exhibit the ability* to lead. This connotation connects the idea of leadership firmly to some aspect of being a human being and by doing so opens the door to a taking a naturalist's approach to the question. Put another way, the definition of leadership as "the ability to lead" gives a direction to take for trying to obtain the kind of deep understanding of the phenomenon of leadership that can rightly be called a *social-natural science*. We then seek to understand *the nature of the ability*.

Issues like these that have been raised here are called metaphysical issues and they are of fundamental practical importance. One can waste a great deal of time and effort if one's

explorations begin by going down a metaphysical pathway that leads to nothing practical and thereby goes to nowhere but a Platonic cul-de-sac. If we step back a little, it appears we might have come to such a theoretical fork just a few steps after starting out, and so we have to make a decision which fork in the road to take. Here we can observe that one of these possible paths of pursuit seems far less abstract and Platonic than the other, namely "the guidance of a leader is an outcome of leadership-understood-as-the-ability-to-lead." This fork is firmly attached to the notions that "leadership" has to do with "the ability to lead" and "guidance" is some quality of leadership. We are thus encouraged to try this path, trusting that this linkage to the second dictionary definition of leadership is a clue best not to ignore in searching for the real definition of leadership.

What, then, does it mean "to lead"? The English verb "lead" has no fewer than twelve dictionary definitions when used as a transitive verb plus another eight when used as in intransitive verb. These are:

> **lead**, *v.t.* [ME. *leden*; AS. *læden*, to lead, from *lidhan*, to go, glide on.]
> 1. to guide by holding the hand, pulling a rope, etc.; as to *lead* a child.
> 2. (a) to guide or conduct by showing the way; to direct; as, the Israelites were *led* by a pillar of cloud by day; (b) to guide the course or direction of (water, rope, etc.).
> 3. to conduct, as a chief or commander; to direct and govern; as, a general *leads* his troops to battle, the orchestra was *led* by an old man.
> 4. to precede; to introduce by going first.
> 5. to hold first place in rank or dignity among; as, she *leads* the class.
> 6. to show the method of obtaining an object; to direct, as in an investigation; as, self-examination may *lead* us to a knowledge of ourselves.
> 7. to begin; to open; specifically, in card playing, to commence a round or trick with; as, he *leads* hearts; he *led* the ace of trumps.
> 8. to draw; to entice; to allure; as, the love of pleasure *leads* men into vices.
> 9. to induce; to prevail on; to influence.
> 10. to pass; to spend; as, to *lead* a life of gaiety, or a solitary life.
> 11. to cause to pass; to cause to spend; to cause to endure; as, "You remember the life he *led* his wife and daughter" – Dickens.
> 12. in hunting, to aim a rifle, etc. just ahead of a moving target.
> **syn.** – conduct, guide, precede, induce, commence, inaugurate, convey, persuade, direct, influence.
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> **lead**, *v.i.*, 1. to show the way by going before or along; to act as guide; to guide; conduct.
> 2. to submit to being led; to be tractable.
> 3. to be or form a way; to tend in a certain direction; to go (with *to*, *from*, *under*, etc.).
> 4. to bring as a result (with *to*); as, one thing *led* to another.
> 5. to be first, chief, or head; to act as leader.
> 6. to begin.
> 7. in boxing, to strike a first blow or one designed to test an opponent's defense; as, never *lead* with your right.
> 8. in card games, to play, or have the right to play, the first card of a hand or round.

If we had hoped the dictionary definition of "to lead" would help clear up the homonym issue discussed above, perusal of these definitions quickly shows us we have come up short. Some of these dictionary definitions (7, 10 of the transitive verb and 7, 8 of the intransitive one) are obvious

metaphorical usages and we need not trouble ourselves with them. It is also clear the idea that "to lead" means "to guide" in some sense or "to persuade" or "to influence" in contexts of other major usages of the word "lead." This is not surprising given the Anglo-Saxon root of the word. How, then, do the connotations of definitions 3 and 5 of the transitive case and the connotations of being first, chief, or head in definition 5 of the intransitive case get into these lists? We can see the relevance of these usages for "leadership in the Pooh-Bah sense" we discussed above. We can also see the relevance of these usages for the noun "leader," the dictionary definitions of which are:

> **leader**, *n.* [ME. *leder*; AS. *lædere*, a leader, from *lædan*, to lead.]
> 1. a person or thing that leads; directing, commanding, or guiding head, as of a group or activity.
> 2. a horse harnessed before all others in the same hitch or as one of the two horses in the foremost span.
> 3. a pipe for carrying water, etc.
> 4. a tendon.
> 5. a featured article of trade, especially one offered at an attractively low price.
> 6. in fishing, a short piece of catgut, etc., often used to attach the hook, lure, etc. to the fishline proper.
> 7. in journalism, one of the main editorials or articles, as in a newspaper.
> 8. in music, (a) a conductor, especially the conductor of a dance band; (b) the main performer in an instrumental or a vocal section, generally given the solo passages.
> 9. in nautical usage, a wooden block or metal piece with holes in it for leading lines to their proper places.
> 10. [*pl.*] in printing, dots, dashes, etc. in a line used to direct the eye across the page, as in a table of contents.

In the context of human leadership we can eliminate all but dictionary definitions 1 and 8 from this list and at least narrow down the scope of our investigation. We must still be mindful that the actions of directing, commanding, and guiding are different connotations for "leader," as is definition 8(b) above. Each of these connotations has its places of importance in different situations and applications and so it would be rather hasty to presume we could eliminate any of them from our list at this point. Nor can we be so presumptuous as to think these different connotations have no deep-lying point of connection if what we wish to comprehend is that still-nebulous something your author earlier called "the essence of leadership."

It has been the practice of the twentieth century and, so far, that of the twenty-first for treatises on the subject of leadership to jump directly into one or the other of these connotations. One can call this "definition by fiat." There are two problems with this. The first is that, helpful as these treatises might be, they often end up finding themselves entangled in those other connotations that they attempted to avoid by the fiat. The second is that if we wish to obtain a *science* of leadership as a phenomenon – a doctrine that teaches us about something in the natural world – we cannot fulfill this purpose by dissecting the different characters of leadership implicated in all these different connotations we have just looked at as our very first step. The modern day distinction

between science and philosophy was first crisply drawn in the eighteenth century by Kant[2], who defined science as *a doctrine constituting a system in accordance with the principle of a disciplined whole of knowledge*. He defined "system" as "the unity of various knowledge under one Idea." A Kantian Idea[3] is a concept for which the practical objective validity of the concept can only be found in a regulative principle of actions, which is to say the Idea of any science must be a concept that *makes the doctrine practical*. Your author has little patience with impractical theories and presumes that you, my dear reader, are likely to share this impatience.

To seek "the essence of leadership" is, therefore, nothing else but to seek out those fundamental regulative principles of action by which our understanding of leadership is made practical. At the beginning of any such quest what one normally encounters is a confused heap of phenomena that plainly exhibits fairly little of what one might call order and regularity. We are usually confronted with a confusing mass of experiences and we must bring order to this confusion. Aristotle offers some sage advice for doing so that we would do well to heed:

> When the objects of an inquiry, in any department, have principles, causes, or elements, it is through acquaintance with these that knowledge and understanding is attained. For we do not think we know a thing until we are acquainted with its primary causes or first principles and have carried our analysis as far as its elements. Plainly, therefore, in the science of nature too our first task will be to try to determine what relates to its principles.
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> The natural way of doing this is to start from the things which are more knowable and clear to us and proceed towards those which are clearer and more knowable by nature; for it is not the same thing to be directly accessible to our knowledge and to be intrinsically intelligible. Hence, in advancing to that which is intrinsically more luminous and by its nature accessible to deeper knowledge, we must start from what is more immediately within our knowledge though in its own nature less fully accessible to understanding. – Aristotle, *Physics*, I

By "clearer and more knowable by nature," Aristotle means "knowable through a theory of the nature of the thing." We obtain this theoretical understanding in layers, beginning from what we encounter directly in experience, and, in a manner of speaking, proceed to "peel back the layers" like the layers of an onion to get to a core understanding of phenomena. This is the heart of the scientific method as a naturalist would practice it. A careful adherence to Aristotle's dictum is necessary if one is to end up with a theory that can be reduced to practice. This is the method that was lost during the period of scholasticism following Europe's Dark Ages and that came to light

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[2] Prior to this what is today called "science" was then called "natural philosophy." Isaac Newton in his day was not known as a great scientist; he was known as a great natural philosopher.

[3] In this treatise the word Idea (capitalized) translates Kant's word *Idee* and is distinct from the word idea (not capitalized), which translates one of Kant's usages of the German word *Begriff*. This is an epistemological distinction that need not trouble us very much in this treatise, but the author felt the reader deserves some explanation of why he capitalized the word Idea. He also wanted to provide professional philosophers with a technical linkage to the deeper details of Kant's Critical metaphysics proper.

again in the seventeenth century through Francis Bacon's summons to scholars at the dawn of what history calls the Age of Reason[4]:

> There are and can exist but two ways of investigating and discovering truth. The one hurries on rapidly from the senses and particulars to the most general axioms, and from them, as principles and their supposed indisputable truth, derives and discovers the intermediate axioms. This is the way now in use. The other constructs its axioms from the senses and particulars by ascending continually and gradually 'til finally it arrives at the most general axioms, which is the true but unattempted way.
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> The understanding when left to itself proceeds by the same way as that which it would have adopted under the guidance of logic, namely, the first; for the mind is fond of starting off to generalities, that it may avoid labor, and after dwelling on a subject is fatigued by experiment. But those evils are augmented by logic for the sake of ostentation of dispute. . .
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> Each of the two ways begins from the senses and particulars and ends in the greatest generalities. But they are immeasurably different; for the one merely touches cursorily the limits of experiment and particulars, whilst the other runs duly through them; the one from the outset lays down some abstract and useless generalities, the other gradually rises to those principles which really are the most common in nature. – Francis Bacon, *Novum Organum*, I

It is one thing to employ Aristotle's dictum (and Bacon's principle) in dealing with the physical sciences of physics, chemistry, and biology. But how does one employ it when the topic of discourse involves a social science and the object of inquiry (leadership) does not lend itself to being impaled by probes, decanted in a beaker, or weighed on a scale? That is the question we must now begin to address.

§ 2.   The Real Conditions of Leader and Leadership Guidance

Modern physicists, chemists, and biologists quite properly excoriate Aristotle for his use of teleology in his approaches to what we today call physics, chemistry, and biology – and do not fully appreciate that to the ancient Greeks "physics" ($\phi\upsilon\sigma\iota\kappa\eta\sigma$) meant "everything natural," i.e., everything that falls within the capacity of humankind to experience. When one uses teleology one is in effect attempting to explain phenomena on the basis of "final causes" (purposes) rather than on the basis of "efficient causes." This is provably inappropriate for the sciences of physics, chemistry, and biology as we know these sciences today. But can there be such a thing as a "physics of psychology" or a "physics of sociology" or a "physics of" any other social science? There cannot be within the narrow confines of "physics" as physicists use that term today. But if we bear in mind Kant's definition of science, there is no reason *a priori* to presume a $\phi\upsilon\sigma\iota\kappa\eta\sigma$ of a social-*natural* science is impossible within the broader scope of that term. Indeed, the lack of progress in the

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[4] Although modern day philosophers and scientists tend to dismiss Bacon with a certain degree of low regard, it should be remembered that he was one of the most influential men of his time. The founding of the Royal Society in Great Britain was inspired by Bacon's work.

social sciences in comparison with physics, chemistry, and biology would seem to be a strong argument in favor of taking such a broader view of things.

If *as sciences* psychology, economics, political science, sociology, and history differ *in kind* from physics, chemistry, and biology, we might do well to keep in mind that the premises and methods of these latter sciences are not necessarily appropriate for social-natural sciences. Taken as a class, the social sciences are *the human sciences*. Where human beings as agents in the natural world enter into the picture, there too human purposes must at least be given some due consideration. Where we say a human being "displays leadership" there too we say something (leadership) is at work as the cause of some future effect. But realizing (making actual) that effect is not "in the nature" of the sort of causes physics, chemistry, and biology deal with. Rather, we here deal with the notion of "cause" in the form of what we would call a "because" and such a thing would appear to inherently involve and entangle the idea of human purposes. Physics, chemistry, and biology do not and cannot deal with this aspect of the world of phenomena. Any speculation to the contrary is mere romance and childishly naive boasting.

Kant tells us[5] that at any particular stage in its development a science falls into one of two broad categories of development. The least developed he called an *historical doctrine of nature* and this type of doctrine contains nothing but systematically organized facts about natural things. Here what is systematic about the science is the unity brought to it by the idea of its topic. Inasmuch as the chosen topic of a science depends on the interests and intentions of the scientist himself, the science is initially formed around and based upon the purpose or purposes the scientist holds in choosing to undertake his labors.

The second broad division he calls *natural science* and this is in turn divisible into two parts: *natural science proper* and *natural science improper*. The distinction here is that the former treats its object according to *a priori* principles (principles based on a *scientific* system of metaphysics) while the latter is organized around empirical principles that are known only as contingent rules of experience[6]. Natural science improper is science in an intermediate stage of development.

Kant, in his most charitable view of chemistry as that science existed in his day, called it a natural science improper and held it to be in many ways more a technical art than a doctrine of science. He held that any special doctrine of nature contained only so much science proper as it contained mathematics. By his criterion it would have to be said that no science as it existed in his day had yet achieved the status of a natural science proper, although physics was coming close. Equally by his criterion, no study of what we today call the social sciences except economics had

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[5] *Metaphysische Anfangsgründe der Naturwissenschaft*.
[6] Nineteenth century spectroscopy would be an example of such an improper science.

advanced even to the point of being an historical doctrine of nature. If Kant were around today, he would still regard most social sciences in this same way except for economics and psychology. An historical review of any special science will find that it came into being and advanced in sequence from historical doctrine to natural science improper and on toward natural science proper. Of today's sciences, Kant would hold that physics is the science coming closest to being full fledged natural science proper. It is interesting and worthwhile to note that we find Kant's view of science echoed in modern times by science historian Thomas Kuhn:

> Effective research scarcely begins before a scientific community thinks it has acquired firm answers to questions like the following: What are the fundamental entities of which the universe is composed? How do these interact with each other and with the senses? What questions may legitimately be asked about such entities and what techniques employed in seeking solutions? At least in the mature sciences, answers (or full substitutes for answers) to questions like these are firmly embedded in the educational initiation that prepares and licenses the student for professional practice. . .

> Normal science, the activity in which most scientists inevitably spend almost all their time, is predicated on the assumption that the scientific community knows what the world is like. Much of the success of the enterprise derives from the community's willingness to defend that assumption, if necessary at considerable cost. Normal science, for example, often suppresses fundamental novelties because they are necessarily subversive of its basic commitments. . .

> No natural history can be interpreted in the absence of at least some implicit body of intertwined theoretical and methodological belief that permits selection, evaluation, and criticism. If that body of belief is not already implicit in the collection of facts – in which case more than "mere facts" are at hand – it must be externally supplied, perhaps by a current metaphysic, by another science, or by personal and historical accident. No wonder, then, that in the early stages of the development of any science different men confronting the same range of phenomena, but not usually all the same particular phenomena, describe and interpret them in different ways. What is surprising, and perhaps also unique in its degree to the fields we call science, is that such initial divergences should ever largely disappear. – Kuhn, *The Structure of Scientific Revolutions*

Leadership as a topic of human inquiry could not yet lay much claim to being treated even as an historical doctrine of nature despite the number of books and articles published on this topic every year. Is a science of leadership possible? There is no more reason to think it is not than there was for the opinion that man could never fly – a presumption overturned at Kitty Hawk, N.C. in 1903. But if such a science is possible, we will have to find a starting point for it. What could this be? Here we can make an observation of some significance: Whatever human leadership might be, in every one of the empirical manifestations in nature where we say leadership is "present" or is "at work," the empirical situation always involves at the minimum two human beings – the one we call the leader and the one we call the follower. The arguable exception to this is the connotation of dictionary definition 8(b) above, a connotation that has no reciprocal dictionary definition that corresponds to the idea of a follower other than "one who follows." This particular case of "leader"

employs a connotation in relationship to the verb "to follow" different from those of dictionary definitions 1 and 8(a) of "leader." The dictionary definitions of "follower" are:

> **follower**, *n*. [ME. *folwere*; AS. *folgere*, from *folgian*, to follow.]
> 1. one who follows; one who takes another as his guide in doctrines, opinions, or example; as, the *followers* of Plato; the warrior distributed the plunder among his *followers*.
> 2. a male sweetheart. [Colloq.]
> 3. a sheet of parchment added to the first sheet of an indenture or other deed.
> 4. the part (of a machine) that receives motion from another part.
> 5. (a) the cover of a piston; (b) the cover of a stuffing, box.
> **syn.** – adherent, disciple, partisan, henchman.

Of these definitions only the first is relevant to the topic of this treatise. More specifically, the relevant dictionary definition is "one who takes another as his guide in doctrines, opinions, or example." It is interesting to note that we obtain a crisper *operational* definition of "leader" indirectly from this definition of follower. "The other" that a follower follows is that person's leader. Contrariwise, a person who has no followers is not a leader. One who does is a leader.

We call this a *real condition of the presence of a leader*. The terminology employed here comes from Kant's system of metaphysics, which is known as Critical Metaphysics. A **real explanation** (*Realerklärung*) is an explanation in terms of Kantian epistemology by which one comes to understand Nature (one's "model" of the world) and which makes the *objective reality* of the concept of an object distinct. Chapter 2 will outline basic principles of Critical Metaphysics we will need for understanding leadership. It is sufficient at this point in this treatise to merely comment that a *Realerklärung* of an object of our inquiry – leadership or leader – will find objective validity only in terms of Critical conditions involving *other* objects. It is the peculiar nature of these objects that such an explanation is always in the form of a sort of "negative" explanation. In other words, to say "no leader is present if there are no followers and therefore the actual existence of followers is the mark of the real presence of a leader" is an example of the sort of condition we must use to establish the real existence (and objective validity of the idea) of a leader. The author asks you, the reader, to accept this as a working premise on the ground that an *intangible* thing (leader) is knowable only from real *effects*. Note, too, the explanation is *epistemological* and not *ontological*.

From this real condition for a leader we proceed to a real condition for leadership guidance. The way in which one perceives an object is called the object's *appearance*. Different perceptions of the same object are called its *accidents of appearance* (its "accidents" for short). When the object is a leader *the ability of a leader to stimulate action accidents by another person is the real condition of leadership guidance*. This real condition is congruent with the second dictionary definition cited earlier. Kant's technical term for an ability of this kind is *Kraft*; the term translates into English as "power" and is understood in the specific context of the ability of an object to determine accidents.

We have yet to explain the nature of leadership ability, but we see that its appearance requires a follower because without a follower the ability cannot be exhibited in an actual experience.

These explanations are, at this point in the treatise, still quite abstract because we are using technical terms in them. In particular, how to make practical use of these explanations has not yet been adequately discussed. The practical consequences of these explanations will become more distinctly clear as we progress with the development of the theory. It is also important to note that a real explanation is not the same thing as a real definition. To understand "the essence of leadership" *substantially* requires a real definition connected to a real explanation of leadership.

§ 3.   Purposes for Understanding a Doctrine of Leadership

To get at a scientific doctrine of leadership we can begin nowhere else as a ground than the nature of being a human being – what we call *human nature*. What do we hope to gain from such a doctrine? It is prudent to ask this question first because it will inform the nucleus of interest around which an historical doctrine of nature first coalesces. We would be wise to not follow the habit of most writers on the topic of leadership and presume that the reason for our interest is self-evident. Things said to "go without saying" in real life often do not. Why, then, are we interested in understanding leadership?

We have seen enough already to appreciate that the idea of leadership is an idea of a social phenomenon. It is without context – and therefore without real meaning – to view leadership other than in terms of relationships among human beings. Without the follower there is no leader, and without a leader there is no leadership. Kant's doctrine teaches us that a human being is the agent of his own actions. This is part of what Kant called the ***homo noumenon*** aspect of being a human being, and it follows from this that a person's determination to act as a follower is an act of self-determination. In other words, a follower *chooses* to follow. A leader can do no more than to *persuade* a follower to follow him. To understand leadership is to understand how a leader effects such a persuasion. The relationship between the leader and the follower in this regard is a *reciprocal* relationship. The leader must choose the means to persuade the follower *and* the follower must choose to be persuaded by the leader's actions. Leader and follower are ***co-determining in their relationship*** insofar as *neither exists without the other*.

Why would someone choose to try to persuade another person to become a follower and why would that person choose to be so persuaded? Experience and history each indicate that both persons have some end effect or effects they wish to realize (make actual). These end effects might or might not be the same for the leader as for the follower. If they are the same we usually call that shared end the "common cause" of these persons. In the other case – apparently the most numerous

of occasioning circumstances – the two persons have differing ends in mind and the unity of their mutual relationship subsists in the means undertaken in order to effect the specific realizations of their end objectives. In either case the leader and the follower both hope to realize some state of satisfactory outcomes we will call *the benefits of their cooperative actions*.

What the realized benefit is to be is not necessarily the same for the leader as for the follower. If each is satisfied when the outcome of their cooperation is realized we can characterize this state of affairs as a *social benefit* of their cooperation. If after the outcome is realized one of these persons is satisfied but the other is dissatisfied, the satisfied person will view the outcome as a benefit while the other will view it as a disbenefit. There are two possibilities here. The dissatisfied person might regard the outcome as being in real opposition to the conditions for his satisfaction being realized ("the outcome is-not a benefit") or he may view it as falling short of the conditions for his satisfaction being realized ("the outcome is not-a-benefit"). We will jointly call these two possible states of affairs an *antisocial benefit* of their cooperation.

It is fitting and pertinent to note at this point that by the "cooperation of the leader and follower" we refer only to their joint *actions* and not to the individual motives each holds in undertaking their joint actions. It is necessary to draw this hair-splitting distinction because it is possible that the motive of the leader and the motive of the follower can be either congruent (it is possible for each to realize their desired benefits through co-determined effects of their cooperation), incongruent (the condition for achieving satisfaction by one of them is such that this condition must also result in dissatisfaction for the other through the co-determined effects of their cooperation), or non-congruent (it is possible for one of them to achieve satisfaction through their cooperation independently of whether or not it is possible for the other to achieve satisfaction through their cooperation). We will group the congruent, incongruent, and non-congruent relationships together under the heading *motive Quality in the leader-follower relationship*. We will later see that the motive Quality in the leader-follower relationship underlies the real possibility of *moral leadership*.

The idea of a motive introduces into consideration an idea philosophy and psychology have historically found to be notoriously troublesome. The word "motive[7]" suffers in usage from the same plethora of differing contexts and connotations we earlier saw attending the dictionary definitions of leadership, leader, etc. As with those ideas, it is both unwise and incorrect to presume "motive" is a word understood by everyone in precisely the same way and in precisely the same contexts. In this treatise *motive* is used as a Critical technical term. In our context it corresponds to

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[7] *Bewegungsgrund*. The Critical theory also contains another technical term, *Bewegursache*, that unfortunately also translates into English as "motive." The Critical real explanation for this term is wholly different from that of *Bewegungsgrund*. Fortunately, it is not necessary to go into the details of this here.

a Kantian term (*Bewegungsgrund*) and its Critical real explanation is *a rational reason for acting according to choice in some particular circumstance*. The idea of a particular motive in this context is an objective idea (which is why motives can determine ends and means) but the *ground* of a particular motive is, again according to the Critical theory[8], *subjective* (which is why the leader and the follower can hold different and possibly incongruent or non-congruent motives).

Some scholars of social science hold the opinion that because subjective factors, such as this one, seem to be present and non-negligible in human behaviors it then follows that some aspects of human behaviors (such as leadership) cannot be turned into sciences and must be viewed instead as either arts or crafts. This is not true. It is true that achievement of such a science requires a different paradigm and a different metaphysical ground than is presently employed by the social sciences. At the risk of belaboring a point that is perhaps already obvious to you by now, your author claims that this different basis is the Critical system of metaphysics. He further points out that none of the existing social sciences have ever tried this paradigm and this system – and he claims this is a fundamental root cause of their practical and serious limitations. One beneficial if indirect purpose for understanding a scientific doctrine of leadership is to provide an example social scientists could use to develop their sciences as social-natural sciences, e.g. in psychology, economics, political science, sociology, history, and anthropology. That the social sciences have failed to keep pace with the speed of advancement in the physical sciences, in engineering, and in technology is a long bemoaned fact. If we wish to change this unfortunate circumstance – and we should wish to do just exactly that – our social sciences will need to become exact sciences in the sense in which this term is used in, for example, physics.

We have introduced the ideas of persuasion, motive, cooperative action, and social vs. antisocial benefit into our discussion. To achieve better understanding of how to persuade, when to allow oneself to be persuaded, how to distinguish between honest and co-beneficial persuasion vs. malevolent propaganda, how to better plan and carry out mutually beneficial cooperative actions, how to better develop mutually beneficial policies in politics and economics, and how to better gauge and predict social and antisocial benefits for human undertakings are all purposes served by a scientific doctrine of leadership. Perhaps you, my dear reader, are already in a position to appreciate its significance and importance for improving the quality of human life. It is nothing else than a fact of broad human experience that effective leadership is often – very nearly always – the determining factor between success or failure in all of these.

If one accepts the premise that having more capable leaders is important for the betterment of life in human society (so long as those leaders consistently exhibit that character we call *moral*

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[8] Wells, *Principles of Mental Physics*.

leadership), understanding how to develop leadership potential in more people is another purpose for developing a sound scientific doctrine of leadership. If leadership were a precious gem rather than a human phenomenon, it would have to be said that societies throughout history have relied upon stumbling across leadership by accident rather than deliberately mining for it. If it were a species of fruit rather than a human phenomenon, societies throughout history would have to be said to have acted more like hunter-gatherers than to have invented an "agriculture of leadership" so that a more plentiful supply of it could be reliably grown. Another purpose for having a doctrine of leadership is to improve our capacity to reliably *produce* moral leadership capabilities and "weed out" immoral leadership capabilities during the process of educating our children.

The ancient Chinese sage Lao Tsu wrote,

> The very best leader is barely known by men.
> Then comes he who they know and love.
> Then comes he who is feared.
> Then comes he who is despised.
>
> He who does not trust enough will not be trusted.
>
> How reticent did those leaders appear, showing
> The importance of their words without unnecessary speech!
> When the best leader's work is done, his actions successful,
> The people all say, "We did it ourselves!"
> – Lao Tsu, *Tao Te Ching*, 17

Ask yourself: "Given a choice, which of these kinds of leaders would I choose to follow? Which kind would I prefer to be myself?" Leadership ability can be gauged in terms of its social impact but how can we develop the kinds of leaders we would desire in government, in business, and in all other fields of human endeavor? The quest to find answers to this is likewise a purpose for developing a scientific doctrine of leadership.

§ 4. Critical Method for a Science of Leadership

The underlying real basis of every science doctrine is comprised of two parts: (1) the doctrine of the objects of the theory, which is called its ontology; and (2) the doctrine of method for developing and applying the theory. The doctrine of method is how the scientist is to employ the concepts, ideas, and definitions of his ontology in his work. Kant called it practical logic for reasoning. One calls these two facets of a science the *matter* and *form* of scientific practice, respectively. This aspect of the nature of science is as old as science itself and dates back to Aristotle (the father of science). If this underlying basis is itself constituted as a science – and, specifically, if it is the Kantian system of science – then the science is a natural science proper. If this underlying basis is not so constituted – for instance, if it is based upon pseudo-metaphysical prejudices, as is the case for our existing sciences – then it is at best a natural science improper

even if some parts of its doctrine meet the Critical standard set for a natural science proper.

A doctrine of method requires three things: discipline, a canon, and an architectonic. Discipline in doctrine of method is the self-compulsion to not stray from what one might call its rules of proper practice. It requires the scientist to pay attention to and exercise care in making his definitions, to develop those principles he uses axiomatically from acroamatic rather than arbitrary foundations, to employ mathematics rather than dogma in the making of demonstrations of theory, and to always be clearly and consciously attentive to the difference between what can be accepted as a fact versus what must be regarded as no more than hypothesis or speculation.

A canon is the total set of fundamental principles *a priori* pertaining to the proper use of scientific reasoning and understanding. Because these fundamental principles are the principles for the proper conduct of the science itself they are prior to the scientific practice and serve to guide and establish the ways and means of the science. With respect to the set of rules a scientific community goes by in carrying out its scientific work, the canon is the set of rules about the rules to which scientific practice is to adhere. Kuhn coined the term *paradigm* as the name for the canon of a science. Kant called it the **applied metaphysic** of the science.

Finally, architectonic is, to use Kant's words, "the art of systems." Because it is systematic unity that turns ordinary knowledge into scientific doctrine, an architectonic is a doctrine for uncovering what is scientific about our general knowledge, namely their unity under an Idea. Architectonic is the rational idea of the form of one's whole scope of knowledge in which scientific concepts and empirical cognitions are placed with respect to one another and are also placed properly within the greater scope of knowledge we call one's overall understanding of nature. The rational scientific idea contains the purpose for making the science as well as the form of a whole of knowledge congruent with this purpose. This *unity of purpose* in the science is what permits the scientist to become aware of gaps in his knowledge and where in relationship to the structure of his knowledge these gaps are found. To produce an architectonic for a science requires a schema, i.e., an outline or ordering of the parts of the science determined from the principle of the purpose of that science. From the purpose for the science come the legitimate topics the science is to contain and a recognition of the boundary limitations of that science – beyond which the science cannot legitimately express opinion and have that opinion be objectively regarded as *scientific* opinion.

None of these three doctrinal components of an organized intellectual endeavor we call a science exist at the beginning of that endeavor. They must be co-developed right along with the observations, experiments, and endeavors that come to supply the organized knowledge built up by the practice of the science. If there is a priority in this co-development, it would have to be assigned to developing the canon of the science because it is from this paradigmatic (and, properly,

metaphysical) basis that the practice of a science comes by its methods, models, and ideas. In this treatise, our canon will always be anchored to the foundation set by Kant's system of epistemology.

The march of a scientific endeavor is not always a march of progress. In the youth of our more successful sciences this methodology of discipline, canon, and architectonic tended to be visible and active in the attitudes and practices of the early scientists. However, as time goes by and the successes achieved by a science mount, it is the unfortunate historical record that attention paid to these key factors becomes less and less in the *teaching* of the science. The result is that future practitioners, while they may know a great deal more about the consequences of theory, gradually come to know a great deal less about the *scientific practice* of science. When this happens it should surprise no one if the science itself begins to undergo breakdown and a splintering of knowledge into isolated sets through overspecialization – a practice that tends to make the scopes of different sciences cease to overlap and, thereby, produces a kind of silo effect that can justifiably be termed ***academic autism***. The one benefit to come out of that nineteenth century philosophical dark age called "positivism" was the rigorous enforcement of scientific discipline. Positivism died out in the twentieth century, was replaced by nothing, and so signs of academic autism can be seen taking root in nearly all our present day sciences. If unchecked it will produce another dark age.

The social sciences especially suffer from this because, with the exception of economics and political science, they had the misfortune to be born at the time of the dark age of positivism. Economics and political science (and, to a considerable extent, history as well) became victims in the nineteenth and twentieth centuries to what we might call "the construction of discipline silos" through specialization. This came to full force in the U.S. because of an educational experiment known as "the open inquiry model" that formally began in the first years of the twentieth century. There is a consequence of this lesson of history that sounds a note of forewarning we should heed: In their current practices none of the existing sciences provide us with an exemplar to follow in constructing a science of leadership. Human science cannot be neatly cut up and its dissected parts separated into free-standing silos of knowledge lacking overlap of their scientific scopes.

Kuhn wrote,

> In the absence of a paradigm or some candidate for paradigm, all of the facts that could possibly pertain to the development of a given science are likely to seem equally relevant. As a result, early fact-gathering is a far more nearly random activity than the one that subsequent scientific development makes familiar. Furthermore, in the absence of a reason for seeking some particular form of more recondite information, early fact-gathering is usually restricted to the wealth of data that lie ready to hand. The resulting pool of facts contains those accessible to casual observation and experiment together with some of the more esoteric data retrievable from established crafts like medicine, calendar making, and metallurgy. Because these crafts are one readily accessible source of facts that could not have been casually discovered, technology has often played a vital role in the emergence of new sciences. – Kuhn, *The Structure of Scientific Revolutions*

So far as a science of leadership is concerned, this is the point where we stand today. The first concern with a doctrine of methods must be to ask how to best move forward from this state of affairs.

The study of leadership is not presently a science. It stands at the fact-gathering stage of the endeavor to become a science and so we must look at the general nature of scientific fact gathering. There are two principal methods a scientist employs to procure these facts: observation and experiment. Claude Bernard, whose work revolutionized the scientific practice of medicine in the mid nineteenth century and ended the historical commitment of medical research to vitalism, wrote

> Men sometimes seem to confuse experiment with observations. Bacon appears to combine them when he says: "Observation and experiment for gathering material, induction and deduction for elaborating it: these are our only good intellectual tools."
>
> Physicians and physiologists, like most men of science, distinguish observation from experiment, but do not entirely agree in defining the two terms.
>
> Zimmermann expresses himself as follows: "An experiment differs from an observation in this, that knowledge gained through observation seems to appear of itself, while that which an experiment brings us is the fruit of an effort that we make, with the object of knowing whether something exists or does not exist."
>
> This definition embodies a rather generally accepted opinion. According to this definition, observations would be noting objects or phenomena, as nature usually presents them, while experiment would be noting phenomena created or defined by the experimenter. We should set up a sort of contrast, in this way, between observers and experimenters: the first being passive in the appearance of the phenomena; the second, on the other hand, taking a direct and active part in producing them. . .
>
> At first sight, and considering things in a general way, this distinction between the experimenter's activity and the observer's activity seems plain and easy to establish. But as soon as we come down to experimental practice we find that, in many instances, the separation is very hard to make, and that it sometimes even involves obscurity. This comes, it seems to me, from confusing the art of investigation, which seeks and establishes facts, with the art of reasoning, which works them up logically in the search for truth. . .
>
> The general objection which I make to the preceding definitions is that they give words too narrow a meaning, by taking account of only the art of investigation, instead of considering observations and experiments at the same time as two opposite extremes of experimental reasoning. So we find these definitions lacking in clearness and generality. To give the definition its full usefulness and value, therefore, I think that we must distinguish what pertains to the method of investigation, used to gather facts, from the characteristics of the intellectual method, which utilizes facts and makes them at once the support and the criterion of the experimental method. – Bernard, *An Introduction to the Study of Experimental Medicine* (1865)

Physicists, chemists, and biologists tend to tell us that the true basis of science is experiment and, therefore, any investigative endeavor that does not employ experimental means is not a true science. However, by this standard one would have to deny that, for example, geology or astronomy are sciences because there are very, very few experiments a geologist can do and none at all that an astronomer can do. As there are very, very few experiments an economist can carry

out, we would likewise have to deny the title "science" to the study of economics. However, all three endeavors are regarded by most of us as actually being sciences. Furthermore, all three endeavors are congruent with Kant's definition of what a science is. We might term them "non-laboratory sciences." The practice of science is the organized effort to gain experience with nature and to develop deeper understandings of nature out of this experience. Bernard went on to write

> In French the word *expérience* in the singular means, in general and in abstract, the knowledge gained in the practice of life. When we apply to a physician the word experience in the singular, it means the information which he has gained in the practice of medicine. It is the same with the other professions; and it is in this sense that we say that a man has gained experience, or that he has experience. Subsequently the word *expérience* (experiment) in the concrete was extended to cover the facts which give us experimental information about things. – [*ibid*.]

So, too, is the case for the scientific study of leadership. Bernard tells us,

> The word observation in the singular, in its general and abstract use, means noting a fact accurately with the help of appropriate studies and means of investigation. In the concrete the word observation has been extended to cover the facts noted; and it is in this sense that we speak of medical observations, astronomical observations, etc.

> In the concrete, when we say "making experiments or making observations," we mean that we devote ourselves to investigation and to research, that we make attempts and trials in order to gain facts from which the mind, through reasoning, may draw knowledge or instruction.

> Speaking in the abstract, when we say "relying on observation and gaining experience," we mean that observation is the mind's support in reasoning, and experience the mind's support in deciding, or still better, the fruit of exact reasoning applied to the interpretation of facts. It follows from this that we can gain experience without making experiments, solely by reasoning appropriately about well-established facts, just as we can make experiments and observations without gaining experience if we limit ourselves to noting facts.

> Observation, then, is what shows facts; experiment is what teaches about facts and gives experience in relation to anything. . . Men of science learn every day from experience; by experience they constantly correct their scientific ideas, their theories, rectify them, bring them into harmony with more and more facts, and so come nearer and nearer to the truth.

> We can learn – i.e., gain experience of our surroundings – in two ways, empirically and experimentally. First there is a sort of teaching or unconscious and empirical experience, which we get from dealing with separate objects. But the knowledge which we gain in this way is also accompanied necessarily by vague experimental reasoning which we carry on quite unawares, and in consequence of which we bring together facts to make a judgment about them. Experience, then, may be gained from empirical and unconscious reasoning; but the obscure and spontaneous movement of the mind has been raised by men of science into a clear and reasoned method, which therefore proceeds consciously and more swiftly toward a definite goal. Such is the experimental method in the sciences by which experience is always gained by virtue of precise reasoning based on an idea born out of observation and controlled by experiment. In all experimental knowledge, indeed, there are three phases: an observation made, a comparison established, and a judgment rendered. By the experimental method, we simply make a judgment on the facts around us, by help of a criterion which is itself just another fact so arranged as to control judgment and to afford experience. . .

> Two things must, therefore, be considered in the experimental method: (1) The art of getting accurate facts by means of rigorous investigations; (2) the art of working them up by means of experimental reasoning, so as to deduce knowledge of the law of phenomena. We said that experimental reasoning always and necessarily deals with two facts at a time: observation, used as a starting point; experiments, used as conclusion or control. In reasoning, however, we can distinguish between actual observations and experiments only, as it were, by logical abstraction and because of the position in which they stand.

> But outside of the experimental reasoning, observation and experiment no longer exist in this abstract sense; there are only concrete facts in each, to be got by precise and rigorous methods of investigation. We shall see, further on, that the investigator himself must be analyzed into observer and experimenter; not according to whether he is active or passive in producing phenomena, but according to whether he acts on them or not to make himself their master. – [*ibid*.]

This is the generalized view of the scientific method of practice and the view by which a mere activity of social study can be made into a study of social-*natural* science. It is easier to observe a distinction between "observation" and "experiment" in the relatively simpler sciences of physics, chemistry, and biology. Economics, psychology, political science, sociology, anthropology, and, yes, even history differ from physics, chemistry, and biology not because they are inherently "unscientific" while the latter are "scientific" or because they are more limited to reliance on passive observation alone but, rather, because the crisp delineation between observational activity and experimental activity cannot be drawn for them as easily and readily as it can in the physical sciences. So, too, is the case for a science of leadership. Social-natural science must pay keener attention to Bernard's analysis of experimental method, treat experimental method with this more general understanding of scientific practice, not make the ungrounded presumption that "experiment" is *defined* by what a physicist, a chemist, or a biologist does in his laboratory, and not bemoan its inability to copy that *particular form* of method.

It is altogether appropriate to classify physics, chemistry, and biology under the heading "physical sciences" while classifying economics, psychology, etc. under the heading "social sciences." But it is insidiously incorrect to think of the former as "natural" sciences while also regarding the latter as somehow or other not owning a title to the label of "natural" science. There is nothing "unnatural" about economics, about psychology, about sociology, &etc. Neither is the phenomenon of leadership in any way "unnatural." The distinction between the physical sciences and a social-natural science is merely that the former deal with dead matter while the latter deals with *human* nature and human beings' interactions with one another.

Kant taught that there are two co-equal aspects to being a human being. The first is the capacity of a human being to be his own agent in the self-determination of his actions, which Kant termed the *spontaneity* of a human being. This aspect he named the *homo noumenon* aspect of being human. The second aspect is the aspect of a human being as a phenomenal object in the empirical

world, where he is regarded as one object among many in nature. Kant called this the ***homo phaenomenon*** aspect of being human. Physical-natural science is concerned only with knowledge belonging to the empirical situation, and when applied to human beings can deal with nothing else than the *homo phaenomenon* aspect. Social-natural science, on the other hand, is either predominantly or completely concerned with the *homo noumenon* aspect of being human. This is a difference *in kind* between the topics of physical-natural science and social-natural science. This difference in kind is what calls for methodological differences between the two and why social-natural science cannot succeed by *imitating* the physicist, the chemist, or the biologist.

We can and must regard the *homo phaenomenon* and *homo noumenon* aspects as constituting two orthogonal coordinate axes in nature. It is nothing but an ignorant prejudice developed over the latter half of the nineteenth and all of the twentieth centuries to think "reality in nature" means and can mean only physical reality. In the mid twentieth century, and in the midst of the metaphysical crisis that physics found itself confronted by as a consequence of the discovery and development of quantum mechanics, physicist Henry Margenau wrote an influential book entitled *The Nature of Physical Reality – A Philosophy of Modern Physics*. In the preface to the 1977 reprint of this book he wrote,

> The word "physical" in the title of this book has long been regarded as a harmless and somewhat indiscriminate adjective, even as redundant, leading to the comment: What other kinds of reality could there be? Recently, however, I have occasionally had to face a different sort of inquiry, culminating in the question: Did you intend to suggest by the use of the qualifier "physical" that there might be other kinds of reality? To this I have answered: Yes. – Margenau, *The Nature of Physical Reality*

It is true that nature as a system is and must be regarded as a unity of physical and what we will term mental phenomena. Indeed, this unity is the acroamatic principle behind what your author has elsewhere called *Margenau's law* (which we will discuss in chapter 2). A criticism justly leveled at the social sciences is that these sciences have wasted entirely too much effort attempting to fit themselves somewhere on the physical axis of nature or, despairing of accomplishing this, have surrendered to the even worse blunder of abandoning hope of earning the title natural science. In his 1987 polemic Allan Bloom wrote,

> The issue is what is the social science atom, and each specialty can argue that the others are properly parts of the whole that it represents. Moreover, each can accuse the other of representing an abstraction, or a construct, or a figment of the imagination. Is there ever a pure market, one not part of a society or a culture that forms it? What is a culture or a society? Are they ever more than aspects of some kind of political order? Here political science is in the strongest position, because the reality of states or nations is undeniable, although they can be considered superficial or compound phenomena. The social sciences actually represent a series of different perspectives on the human world we see around us, a series that is not harmonious, because there is not even agreement as to what belongs to that world, let alone as to what kinds of causes would account for its phenomena.

> A further source of dispute within social science concerns what is meant by science. All agree that it must be reasonable, have some standards of verification and be based on systematic research. . . But to what extent the example of the most successful of the modern natural sciences, mathematical physics, can or should be followed within social science is a matter of endless discussion or quarreling. Prediction is the hallmark of modern natural science, and practically every social scientist would like to be able to make reliable predictions, although practically none have. Prediction appears to have been made possible in natural science by reducing phenomena in such a way as to be amenable to expression in mathematical formulas, and social scientists want the same thing to happen in their discipline. The issue is whether various efforts in that direction cause distortion of the social phenomena, or lead to the neglect of some that are not easily mathematized and the preference for others that are; or whether they encourage the construction of mathematical models that are figments of the imagination and have nothing to do with the real world. A kind of continuous guerilla war goes on between those who are primarily enthusiasts of science and those who are primarily attached to their particular subject matter. – Bloom, *The Closing of the American Mind*

So far as doctrine of method goes, mathematical expression of scientific theory is not an issue; every proper science must contain mathematics as part of its doctrine of objects. What is important to remember is merely this: mathematics is nothing more and nothing less than a *language* for saying things very precisely and in a way that enables deductions of consequences. It is true enough that as a language mathematics involves no small effort in acquiring the ability to speak it and to understand what is said by it. But if a social science finds it difficult to mathematize its theories, this means nothing else than that the scientist does not know how to precisely say that which he wishes to say. Here it is pertinent to note that the word "mathematics" derives from the Greek word *mathēma*, which means "that which is learned." It is also a pertinent fact, and one not generally appreciated by those who are not professional mathematicians, that mathematical structures are *constructed*. Indeed, the construction of mathematical structures is a primary task that mathematicians undertake as part of their work. If existing mathematical structures do not neatly fit the phenomenon one is attempting to explain, the answer is not to alter the phenomenon to fit the mathematics but, rather, to alter the mathematical structure to fit the phenomenon. Protests by so-called "pure" mathematicians notwithstanding, the mathematical structures that are regarded as the important ones by mathematicians are precisely those that prove useful and fecund for science and it has always been this way since the birth of mathematics proper in ancient Greece.

To what extent should a social science attempt to imitate the ontology and methods of physics? The Critical answer is: ***not at all*** excepting in those parts of the science that fall firmly on the axis of *homo phaenomenon*. And this is only a small part of the topic of a social-natural science. The reason modern mathematical physics is the most successful of the sciences is due to the fact that it is also the most simple of all the sciences. Physics is not, as physicists might wish it, the queen of the sciences. That supposition is nothing more than the childish boasting of positivism. A social-natural science, then, must attend to building up the doctrine of method as well as the doctrine of

objects (ontology) most appropriate for its endeavors. And this brings us to the subject matter of the next chapter.

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