Toward an Integrated Theory of Foresight

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1. Introduction

Knowledge of future effects relies on knowledge of past causes. Likewise, precision in knowledge of future events relies on the precision in knowledge of particulars and universal aspects of past events. It is the role of science to approach this precision through classification and organization. Due to methodological differences, science is divided into two sub-sciences: the natural sciences and the sciences of human action—each science approaching particulars and universals in different ways. The natural sciences, on the one hand, take particulars and induce universals. In the sciences of human action, on the other hand, there are two disciplines, history and praxeology, devoted to particulars and universals, respectively. Once the epistemological intricacies of the division of the sciences are sorted out, we are properly informed to construct a theory of how future events can be known. It is important that the theory of foresight set forth below is not thought of as a random series of conjectures, but that it is grounded in a general rationalist philosophy that is internally consistent.

2. The Principle of Methodological Dualism

Science is presently in a position to regard the study of man and the study of nature as two separate disciplines. The rationalist position on science is a methodologically dualist one—acquisition of knowledge in the realm of the study of man is fundamentally different than the method of acquiring knowledge in the study of nature. Due to the nature of our position in the study of man, we have privileged access to the subject; that is to say, since we are humans studying other humans we can classify and organize our knowledge through direct introspection, understanding, and communication with other humans.¹ The study of action—as opposed to involuntary behavior—is a teleological one, meaning we attach the concept of ends or purpose to an action. Knowledge that all human actions are identical in form allows us to approach the subject with *a priori* knowledge of the causes in each action, namely that all action is the purposeful utilization of means to achieve ends. Furthermore, we have unique knowledge of the particular circumstances of an action constrained by the form of action which requires us to deem every action

¹ In human action "the ultimate constituents of our fundamental generalizations are known to us by immediate acquaintance. The natural sciences are known only inferentially." (Lionel Robbins, *On the Nature and Significance of Economic Science* (London: Macmillan, 1935), p. 105.) "What we know about our own actions and about those of other people is conditioned by our familiarity with the category of action that we owe to a process of self-examination and introspection as well as of understanding of other peoples' conduct. To question this insight is no less impossible than to question the fact that we are alive." (Ludwig von Mises, *The Ultimate Foundation of Economic Science* (Indianapolis: Liberty Fund, 2006), p. 64.)

as unique and non-repeatable. Thus every particular action belongs to a class by itself. The study of nature is a fundamentally different one. Since we are not members of the subject we study in the natural sciences we must come to know the reasons behind phenomena indirectly through observation. We are not in a position to understand the behavior of external objects by introspection, as we are able to in the study of man. We are not immediately able to comprehend the reasons why external objects behave the way they do. Instead of knowing the general form of the behavior as we do in human action, we are presented with particular events that are, to the studiers of natural phenomena, elements in a class of similar events. Whereas in the study of human action we know the general form of all actions—that a preferred end is achieved through the use of means—we can only observe the particular event and place it in a class of similar events in the study of nature.

This methodological division between the natural sciences and the science of human action, or praxeology², is *the principle of methodological dualism*. This principle is a consequence of practical deficiencies and epistemological necessity. Practically speaking, the method of natural sciences, or empiricism, has failed to come close to finding any regularity in the physiological, neurological, chemical, or psychological events in the brain and the actions an individual performs. Thus, currently there is no reason to believe that there is any connection; as far as science is concerned, there is a real and epistemological difference between the body and the mind.^{3,4} Besides this practical consideration, there are more fundamental reasons behind the principle. One tenet of empiricism is the belief that prediction is the final arbiter of a true law. This is appropriate in the natural sciences where the objects under study are independent of human interaction. We will argue later that prediction is impossible in human action. We will also find that the division between praxeology and natural science is the same division between class and case probability as well as the difference between what we will call probabilistic prediction and anticipation.⁵

² Praxeology means "the logic of human action". Louis Bourdeau coined this term in *Théorie des sciences: Plan de Science intégrale* in 1882. Austrian economist Ludwig von Mises would eventually adopt this term to describe the deductive study of man in his magnum opus *Human Action* (Auburn, Ala.: Ludwig von Mises Institute, 1998).

³ Ludwig von Mises, Theory and History (Auburn, Ala.: Ludwig von Mises Institute, 2007), p. 1.

⁴ It is important to note that this is not a metaphysical argument for mind/body dualism. It is only arguing that the path to understanding the world must be from two different directions: one for understanding ourselves and one for understanding external phenomena.

⁵ A complete critique of methodological monism falls outside the scope of this essay, however the following is an interesting critique by Mises: "The essence of logical positivism is to deny the cognitive value of a priori knowledge by pointing out that all a priori propositions are merely analytic. They do not provide new information, but are merely verbal or tautological, asserting what has already been implied in the definitions and premises. Only experience can lead

3. Methodology of the Two Sciences

The purpose of science is to make the world intelligible. The world is unorganized from the perspective of primitive man. It seems to lack order and cannot be grasped. But the mind quickly finds ways of organizing everything in the external world as well as its own thoughts.⁶ The ability to begin classifying and organizing the world is essential to expanding knowledge of the world.⁷ As science progresses, it discovers the practical consequences behind the principle of methodological dualism. We know the causes of human action *a priori*; we do not immediately know causes of natural phenomena. Natural science, using induction, starts with the effects and moves back toward the causes. Praxeology, which uses deduction, starts with the causes and moves toward the effects.

The Method of the Natural Sciences

Natural science is the process of creating classes in observed phenomena. It usually begins with classification of qualitative sense data. Once a point is reached where no further qualitative classification is possible, the natural scientist begins to break down those classes into sub-classes based on quantitative, measurable differences. For instance, two white, sweet tasting substances are homogeneous based on the qualitative classification of sight and taste, and perhaps feel. But the curiosity of the chemist will eventually find that what we call sugar is more precisely two structurally (i.e., quantitatively) different substances sucrose and crystalline fructose. This classification scheme is demonstrated by the hierarchical structure to natural science in terms of quantitative breakdown of biology, which is a quantitative breakdown of zoology. Hayek sums up the chief characteristic of natural science: "The process of reclassifying 'objects' which our senses have already classified in one way, of substituting for the 'secondary' qualities in which our senses arrange external stimuli a

to synthetic propositions. There is an obvious objection against this doctrine, viz., that this proposition that there are no synthetic a priori propositions is in itself a—as the present writer thinks, false—synthetic a priori proposition, for it can manifestly not be established by experience." Mises, *The Ultimate Foundations of Economic Science* (Indianapolis: Liberty Fund, 2006), p. 4.

⁶ Ibid., pp. 12-14.

⁷ Frank H. Knight argues, "It must be possible not merely to assume that the *same* thing will always behave in the same way, but that the *same kind* of thing will do the same, and that there is in fact a finite, practically manageable number of *kinds* of things. Hence the fundamental role which *classification* has always played in though and the theory of thought." (*Risk, Uncertainty, and Profit* [Mineola, NY: Dover Publications, 2006] pp. 205-6.)

new classification based on consciously established relations between classes of events is, perhaps, the most characteristic aspect of the procedure of the natural sciences."⁸

This process of classifying and re-classifying observed phenomena is essential to indirectly acquiring knowledge of causes. The cause of a given external event is initially unknown, but eventually incomplete knowledge of causes shows up in statistical correlations. A natural scientist may find that result Z follows condition A in 70% of the trials, Y follows A in 20% of the trials, and X follows A in 10% of the trials. He immediately forms a hypothesis that condition A is actually a combination of several sub-conditions A₁, A₂, A₃, ..., A_n. More precise knowledge of the cause of Z is found by breaking A down into its components until experimental verification shows that condition A_n results in Z in 100% of the trials. Thus the process of breaking down possible causes into sub-conditions is the process by which natural science begins with an observed effect and works back to the cause. These statistically significant causes become time- and place-invariant constant relations. In other words, condition A_n always precedes result Z, regardless of when and where A_n is present. This is the process that particle physicists have used to sort the elementary particles which comprise atoms. What we have described is the general scheme of the scientific method. This method allows natural scientist to take particular events and abstract from the timeand place-variant aspects to form universals. This process continues until it reaches an ultimate given where no further reduction of possible candidates is technologically or epistemologically feasible; the use of statistical correlations remains the most precise way to show cause and effect.9

The Method of Praxeology

In the realm of praxeology, we know *a priori* the ultimate causes of every action: the subjective valuations of individuals, i.e., preferences.¹⁰ We live in a world of scarcity—meaning the quantity of means *required* to achieve preferred ends is greater than the *available* quantity of means. Scarcity creates the condition wherein man must choose between ends. He will pursue the end that he prefers more. This is the process of economization. Important to note is that the preferences are

⁸ F.A. Hayek, The Counter-Revolution of Science (Indianapolis: Liberty Fund, 1979) p. 32, 38.

⁹ "The progress of scientific research may succeed in demonstrating that something previously considered as an ultimate given can be reduced to components. But there will always be some irreducible and unanalyzable phenomena, some ultimate given." (Mises, *Human Action*, p. 17.)

¹⁰ John E. Cairnes wrote in 1861 that "mankind has no direct knowledge of ultimate physical principles" ... "the economist starts with a knowledge of ultimate causes." (John E. Cairnes, *The Character and Logical Method of Political Economy* [New York: Augustus Kelley, 1965], p. 83, 87, 89-90, 95-96.)

not cardinal. Saying "I prefer A 13 times more than I prefer B" is an absurdity; there is only "I prefer A to B". Thus preference is ordinal, it is ranked or graded in the minds of an individual.

Subjective valuations are manifested in action. If Smith prefers A to B, he will set out to pursue A. Thus preferring A to B is categorically no different than the act of pursuing A instead of B. Subjective valuations are necessarily qualitative. It is impossible, mathematically or otherwise, to quantify ordinal information. One of the main reasons for the practical deficiency in the attempt to unify science under one method is the inability of the natural sciences to measure preference.^{11,12} Preference is ever changing; the same man can prefer A to B at one time and B to A at another time. Where there is eternal flux there is no hope for finding any constant regularities. Thus, experimental methods are inapplicable in praxeology.

Since the inductive methods of experimentation are not applicable in praxeology, deductive methods are the only remaining option, as is the case with mathematics and logic; the *a priori* is the only other option besides the *a posteriori*. The empiricist counters that *apriorism* has no relation to reality—that it is simply tautological deductions inside our mind. Immanuel Kant showed, however, that the law of non-contradiction is sufficient to create *a priori* concepts that have bearing on reality. Synthetic *a priori* concepts are known to be true and have bearing on reality because the denial of it would be a performative contradiction. Or, put another way, the *a priori* proposition of the Action Axiom necessarily requires the *a priori* concept of action to even consider it (or deny it).¹³ Praxeology starts its investigation with such a concept.

¹¹ Mises, The Ultimate Foundation of Economic Science, p. 33.

¹² The Neo-classical school of economics has denied this, going so far as to conjure an imaginary unit called the "util". How this is measured or observed, they do not say. Since preference is ordinal, there is no possible way to apply a unit to valuation. The logical inconsistency of the util is inexcusable.

Not only do units not exist in subject valuations, but even where units do exist (monetary, physical, technological, etc.) the empiricist mathematical economists fail even the most basic mathematical test of dimensional analysis (any meaningful equation must have the same units on both sides of the equality, or inequality), which renders their "findings" nonsensical and useless. See William Barnett's penetrating critique of economic models based on their failure to obey dimensional analysis, a failure that no honest empiricist would tolerate: "Dimensions and Economics: Some Problems" *The Quarterly Journal of Austrian Economics* vol. 6, no. 3 (Fall 2003): 27-46.

¹³ See Immanuel Kant, *The Critique of Pure Reason* (Cambridge: Cambridge University Press, 1999) and Hoppe, *Economic Science and Austrian Method*, p. 17-21, 60-1. This is not the case with the admittedly tautological truths of arithmetic. Asserting 2+2=5 is not a performative contradiction because the *a priori* concepts of 2, addition, equality, and 5 are not required to assert that proposition. On this note, Hoppe proposes that praxeology is more fundamental than logic and mathematics. He argues that the *a priori* character of logic and mathematics is grounded in the concept of action. This goes beyond (in validity and rigor) Kant's demonstration of the synthetic nature of arithmetic. If Hoppe is correct *all a priori* propositions derived from praxeological concepts are synthetic. See Ibid., 65ff. and Hans Hermann Hoppe, *Handeln und Erkennen* (Bern, CH.: Herbert Lang, 1976).

Praxeology begins with the Action Axiom: human action is purposeful action; it is the utilization of means to achieve ends. The concept is synthetic a priori since it is a performative contradiction to deny such a claim. Anyone who attempts to claim that action is not purposeful has a purpose. He also uses the means of his mouth and vocal cords to achieve the end of arguing his case. In short, he is using means to achieve an end-he is acting. All propositions about economics (heretofore the most fully elaborated branch of praxeology) can be deduced from the irrefutably true Action Axiom. For instance, the law of diminishing marginal utility is immediately inferred. Every actor prefers that which provides more satisfaction to that which provides less satisfaction. If the supply of a good is increased, we know apodictically that the next unit of that good can only be directed toward the next most preferred end, i.e., the marginal end. Thus as the supply increases the marginal utility decreases. This method is also used to deduce a theory of value, exchange, price, socialism, economic calculation, interest, production, entrepreneurship, wages, money, taxation, monopoly, business cycles, etc.¹⁴ All of these theories, provided they were correctly deduced, are true because they are anchored by the undeniable Action Axiom. Just as in mathematics and logic, mistakes are found by checking the deductive chain of propositions, not in "testing" theories as a physicist would. If the deductions are correct, there is no denying that they apply to reality.

The *apriorist* approach to economics is not as controversial as it seems. Economics has long been a deductive science. Proto-Austrians include Richard Cantillon (1680s-1734), A.R.J. Turgot (1727-1781), J.B. Say (1767-1832), Frédéric Bastiat (1801-1850), Nassau Senior (1790-1864), and John E. Cairnes (1823-1875). Each of these economists used, either overtly or tacitly, the deductive method.¹⁵

¹⁴ Carl Menger, the founder of the Austrian School, was the first to begin carrying out this deduction in his *Principles of Economics* (Auburn, Ala.: Ludwig von Mises Institute, 2011). Eugen von Böhm-Bawerk in his three volume magnum opus *Capital and Interest*, trans. George D. Hunke and Hans F. Sennholz (South Holland, IL: Libertarian Press, 1959) deduced a theory of capital, production, and interest. Ludwig von Mises further corrected and elaborated on Böhm-Bawerk and Menger in his *The Theory of Money and Credit*, trans. J. E. Batson (Auburn, Ala.: Ludwig von Mises Institute, 2009) and in his 800 page magnum opus *Human Action* deduced the entire scope of economics. Mises's student Murray N. Rothbard corrected some deductive mistakes by Mises in his 1400 page magnum opus *Man, Economy and State with Power and Market* (Auburn, Ala.: Ludwig von Mises Institute, 2009).

¹⁵ J.B. Say wrote: "Political economy ... whenever the principles which constitute its basis are the rigorous *deductions* of undeniable general facts, rests upon an immovable foundation." (Jean-Baptiste Say, *Treatise on Political Economy* [New York: Augustus Kelley, [1880] 1964], p. xx, xxvi.) Emphasis added.

4. Praxeology and History¹⁶

Praxeology is a science consisting solely of universals. The study of human action is not complete if it says nothing of particulars. The role of history fills this gap. Indeed, history is the study of particular human actions, which are *res gestae*. While praxeology deals with the form that an action takes, history deals with the specific time, place, and circumstances that an action takes place. Praxeology does not ask why a particular action is taken but simply takes it as given that it was taken. History, on the other hand asks why an action was taken. Its focus is the subjective judgments that spawned an action, the means that were used in that action, and the result of the action. Any statistical data pertaining to human action is history. It cannot possibly reveal laws or theories. Statistical data only depicts a wholly unique, heterogeneous event.¹⁷

This can be demonstrated by the following example. A statistician trying to find statistical correlations in the traffic passing through an intersection will forever be at a loss using empirical methods. The first day might reveal that there is increased traffic through the intersection in the morning and the afternoon (it is rush hour). But then suddenly after five days this correlation does not hold up (it is the weekend). But then after weeks of testing he finds regularity again, the increased traffic occurs for five days and then two days it does not occur. But again after extended testing, he reaches another anomaly: there was a series of five days of increased traffic in the morning and afternoon, then two days of light traffic, and suddenly the next day there is not increased traffic in the morning and afternoon (it is a holiday). Finally, after a year of statistical investigation he has found a pattern. He believes he is able to predict, as a physicist would, the pattern of traffic. But he finds an anomaly once again (the population is migrating due to opportunities in another part of town). It becomes obvious that there is no way a statistician can apply the methods of the natural sciences to derive laws of human action.

The historian's job is to sort through the infinite complex of perspectives and data to analyze the means that were chosen for a certain judgment of value. Since thoughts are subjective it requires a subjective mind to analyze them. The historian must *understand* (i.e., be in a position to empathize with a subject, a position physicists are not in with regard to their subject) the motives behind an

¹⁶ The most comprehensive book on this topic is Mises's Theory and History.

¹⁷ Econometrics is nothing but applied history. The data it processes simply says that such and such was so and so at a given time and place—no more, no less. Econometrics cannot tease laws from endless data in a manner similar to a physicist. The claim that praxeologist do not use statistics is a false one. Unlike positivists, praxeologists are not methodological imperialists. They recognize the limits of their methods. One limit is knowing that statistics, in human action, is composed of *res gestae* and have no special relation to praxeology and economics.

action if he is to attempt to analyze them and assess if the means were suited for the end chosen. German historian Max Weber introduced the German *Verstehen* (understanding or comprehension)¹⁸ to describe this concept. *Verstehen* is the primary tool of a historian. The most familiar means process of *Verstehen* is communication and pseudo-communication. A historian can verbally interact with a subject he wishes to understand by an interview or otherwise. Pseudo-communication is used when there is no way that a historian can verbally communicate. Temporal restrictions prevent a modern day Revolutionary War historian from understanding the motives behind Benedict Arnold's betrayal. But he can supplement verbal communication with written symbolic communication (i.e., letters, diaries, etc.).

With the concept of *Verstehen* now established, we have a solution to the issue with the traffic passing through an intersection. The statistician would never be completely oblivious to the workings of traffic on weekdays, weekends, and holidays, etc. No matter how hard he tries to emulate the physicist's methods, the method of *Verstehen* creeps into his findings. He *understands* that traffic increases on workdays. This is precisely what historians do. They take raw data and sort it with their understanding of human motivations and volitions. In this sense, statisticians and econometricians studying human actions are always historians; they cannot and do not derive laws or regularities in their findings.

Verstehen is a tool of a form of psychology, though the psychology we speak of is different than naturalistic psychology. Mises explains that

the term 'psychology' is applied in another sense too. It signifies the cognition of human emotions, motivations, ideas, judgments of value and volitions, a faculty indispensable to everybody in the conduct of daily affairs and no less indispensable to the authors of poems, novels, and plays as well as to historians. Modern epistemology calls this mental process of the historians the specific understanding [=Verstehen] of the historical sciences of human action. Its function is twofold: it establishes, on the one hand, the fact that, motivated by definite value judgments, people have engaged in definite actions and applied definite means to attain the ends they seek. It tries, on the other hand, to evaluate the effects and the intensity of the effects of an action, its bearing upon the further course of events.

In order to prevent the confusion of psychology proper and the understanding of subjective

¹⁸ The concept of *Verstehen* has also been described as interpretation, see Ludwig Lachmann, *The Legacy of Max Weber* (Berkeley, CA: Glendessary Press, 1971), and as specific understanding (see Mises, *Theory and History*). See also R. G. Collingwood, *The Idea of History* (Oxford, UK.: Oxford UP, 1994).

judgments of value, Mises coined the term *thymology*.¹⁹ We mean by thymology the study of "of human emotions, motivations, ideas, judgments of value and volitions." The use of thymology and *Verstehen* is not exclusive to historians, however. Valuation is itself an act of thymological understanding. Every actor uses thymological methods when he takes given conditions into account for future results. As we will see later, the entrepreneur is a market actor that specializes in a particular form of *Verstehen*.

Frege's Three Realms, Theory and History, and Methodological Dualism

German logician Gottlob Frege developed a way of viewing the sciences that will not only help sum up what we have said thus far but also help us approach the concepts of probability and foresight. In his essay "The Thought: a Logical Inquiry"²⁰, he showed that the world is categorized by two conditions: public vs. private and sensible vs. non-sensible. The first realm is the Outer Realm, which is public and sensible. The objects in the Outer Realm are public in the sense that no one has exclusive access to them-a green tree discussed in a scientific study is observable by anyone. They are sensible in that they are grasped through the senses. To this realm belong all objects that are the subject of the natural sciences. The Inner Realm is all those objects that are private-in the sense that only one person has direct access to. They are obviously non-sensible in that the ideas and subjective valuations are not grasped through the senses. Historians and entrepreneurs access this information through communication and pseudo-communication of Verstehen. The realm described as sensible and private was absurd to Frege, and rightfully so. Anything that is private must be non-sensible since privateness presupposes that only one person has exclusive access to the information. Finally, Frege argued that there was a Third Realm. This realm is public and non-sensible. To this realm belong the aprioristic sciences of mathematics, praxeology, and logic. They are public in the sense that anyone can come to know these ideas through introspection, but they are also non-sensible because they are merely part of the structure of our rationality.

Frege's realms approach the concepts of the principle of methodological dualism and the bifurcation of theory and history in the study of man. Frege's Three Realms also match up seamlessly with our terminology of thymology, praxeology, and natural sciences. We can modify, or

¹⁹ Mises, *Theory and History*, p. 264. Mises coined the term thymology from the Greek word $\theta \dot{\nu} \mu \sigma \varsigma$, which means "spiritedness". This word has grammatical advantages to Santayana's "literary psychology" as there is no way of forming the adjective form.

²⁰ Gottlob Frege, "The Thought: A Logical Inquiry" Mind, New Series, Vol. 65, No. 259. (Jul., 1956), pp. 289-311.

rather augment, Frege's Three Realms with our new terminology. The following is an *Austrian* Three Realms diagram²¹, which depicts what has thus far been argued:



5. Probability

One of the first deductions an economist comes across is man's relationship to the future. The Action Axiom implies that an individual chooses alternative courses of action. We deduce from this that the future is uncertain. If we know with certainty what will transpire in the near and distant future, there would be no reason to act with a goal in mind. The goals, ends, means, and actions would be pre-ordained by our position in time and space. In short, there would be no action if the future were certain. Uncertainty and action are two sides of the same coin—uncertainty is directly implied in the Action Axiom.

Action is always forward looking; therefore knowledge of the past is only a means to an end. Knowledge of past events allows for actions to be directed toward the future—it speeds up the deliberative process and allows for more effective action.

Natural science does not render the future predictable. It makes it possible to foretell the results to be obtained by definite actions. But it leaves impredictable [sic] two spheres: that of insufficiently known natural phenomena and that of human acts of choice. Our ignorance with regard to these two spheres taints all human actions with uncertainty.... *The most that can be attained with regard to reality is probability.*²²

The importance of probability is tantamount to the importance of effective action. The two spheres

²¹ Adapted from Roderick T. Long, "Wittgenstein, Praxeology, and Frege's Three Realms" presented at the Wirth Conference on What is Austrian in Austrian Economics in Mississauga, Ontario on October 17-18, 2008.

²² Mises, Human Action (Auburn, Ala.: Ludwig von Mises Institute, 1998), p. 105. Emphasis added.

Mises mentions in describing the nature of uncertainty are the same two spheres we took so much effort to differentiate with regard to method. Unsurprisingly, there are two types of probability that fall neatly in the scheme of the principle of methodological dualism. The first type is Class Probability, which is used in knowing the future in the natural sciences. The second is Case Probability, which is used in knowing the future in the study of man. Both are indispensible for human action.

Class Probability

The natural sciences classify observations based on cause and effect. Once the ultimate given is reached wherein there is no possible further classification, it becomes necessary to use statistical correlations to have a general idea of how a future event will occur. Class probability means: we know the behavior of a class of phenomena as a whole but know nothing about particular elements of the class except their membership in the class. This tool is extremely useful in the natural sciences; it allows the progress of action with regard to natural events to continue unhampered (though in a less precise manner) until the barrier of the ultimate given is surpassed. Presently, physicists use class probability to study the behavior of electrons. We know nothing of the particular electron except that it belongs to a certain orbital in a certain class of atoms. The most we can say about an electron's position at a given time is that it has an X% probability of being in a specific location at specific time.²³ Thus the study of electricity, chemistry, and atomic structures continues while the ultimate given on the causes of electron paths is unknown. Ludwig von Mises's brother Richard von Mises²⁴ is the originator of this type of probability, what he called the frequency theory of probability.

Richard von Mises argued that the collective is the starting point of the application of

²³ This use of class probability is even more prevalent in the study of weather. A meteorologist takes numerous variables including barometric pressure, wind speed, temperature, etc. and compares them to days in the past with similar conditions. The ratio of the total number of days with rain, for example, to the total number of days with similar conditions comprises the forecast for rain on a given day. Basic genetics, e.g. knowing if a baby will be a boy or girl, also uses this principle of class probability.

²⁴ Richard von Mises (1883-1953) was a professor of mathematics at the University of Straßburg. He was appointed to director (with full professorship) of Applied Mathematics at the University of Berlin. He fled the Nazi party to Turkey in 1933 where he became chair of Pure and Applied Mathematics at the University of Istanbul. He eventually became Gordon-McKay Professor of Aerodynamics and Applied Mathematics at Harvard University. Along with the frequency theory of probability, he developed the Distortion Energy Theory of Stress, the von Mises Yield Criterion theory of plasticity, and is the originator of the famous Birthday Problem of probability. Interestingly, he and his brother Ludwig were estranged for years due to their extreme disagreement on the nature of science. Richard was a staunch positivist, writing a book titled *Positivism: A Study in Human Understanding* (Cambridge, Mass.: Harvard University Press). His foundational work on the frequency theory of probability is *Probability, Statistics, and Truth* (New York, NY: Macmillan Company, 1939) and *Mathematical Theory of Probability and Statistics* (New York, NY: Academic Press, 1964).

probability calculation. A collective is a long series of homogeneous elements, which differ in observable attributes, i.e., having a 6 on a die, being red, being in a certain position, etc. A collective that fulfills two conditions is appropriate for the application of probability: first, the relative frequencies of the attributes must tend toward a limiting value; second, the limiting value must remain constant regardless of place selection.

The first condition is fairly straightforward. The ratio of the observations that fulfill a certain attribute to the total observations approaches a fixed value as more observations are made.²⁵ For example, we may be looking for a 6 on a die. As we continuously roll it, we notice that the ratio of 6s landing face up to the total observations tends toward 1/6. As we continuously take observations, the limiting value becomes more and more stable. The second condition for a collective is the principle of randomness. If the principle of randomness holds, the limiting value will not change based on any method of place selection. Place selection is the formulaic selection of certain observations. Suppose we have a sequence of observations $X_1, X_2, X_3, ..., X_n$ which makes up our collective. So in our example we could use a method of place selection to form a sub-sequence of randomness holds if the sub-sequence of observations tends toward the same limiting value despite the place selection. Richard von Mises called this definition of randomness The Principle of Impossibility of a Gambling System, which is appropriate. The chances that a truly random roulette wheel will bring up 0 will remain 1/36 regardless of our place selection, be it the third trial or every other trial.²⁶

If these two conditions are properly met, then we may speak of the probability of an event occurring. "The limiting value of the relative frequency of a given attribute, assumed to be independent of any place selection, will be called 'the probability of that attribute with in the given collective'."^{27,28}

Class probability is only used in the Outer Realm; it is empirically derived. We can think of the probability of an object as an observed physical property just as color, mass, and density are.

²⁵ Anyone familiar with statistics will notice the similarity between the limiting value condition and the law of large numbers. Richard von Mises avoided this terminology after Poisson confused two concepts with the same term.

²⁶ Mises, Probability, Statistics, and Truth (New York, NY: Macmillan Company, 1939), p. 1ff.

²⁷ Ibid., p. 38.

²⁸ The probability $P(x) = \lim_{n_t \to \infty} \frac{n_x}{n_t}$, where n_x is the total number of trials with a given attribute and n_t is the total number of observations.

Case Probability

It was shown above that all human actions are discernably unique, heterogeneous events. We know that the subjective valuations of individuals differentiate any one action from another. So we run into a problem with probability: there is no way of forming a collective from events that are heterogeneous since a collective, by definition, is made up of homogeneous events. Richard von Mises points the absurdity of the probability of collective with one element: "In many uses of the probability notion in practical life the collective can be easily constructed. In cases when this proves to be impossible, the use of the word probability, from the point of view of the [frequency] theory of probability, is an illegitimate one, and numerical determination of the probability is therefore impossible."²⁹

Ludwig von Mises expanded on his brother's theory of probability and solved this problem of classless collectives, with what he calls case probability.

Case probability means: We know, with regard to a particular event, some of the factors which determine its outcome; but there are other determining factors about which we know nothing.... Case probability has nothing in common with class probability but the incompleteness of our knowledge. In every other regard the two are entirely different.... Case probability is a particular feature of our dealing with problems of human action. Here any reference to frequency is inappropriate, as our statements always deal with unique events which as such—i.e., with regard to the problem in question—are not members of any class.³⁰

This concept of probability fits neatly into the Inner Realm of our Austrian Three Realms. The particular event, which we know some of the factors that Mises talks about, is any human action.

One could argue, however, that we can form a collective with human events. For example, we *could* group all actions pertaining to watching a movie into one collective and find the limiting value of those who chose to watch an action film. True enough, that limiting value may even be easy to find. But Hoppe brilliantly showed that the second condition of a collective does not hold up. We do indeed have a method of place selection that will alter the limiting value–namely the method of *Verstehen*.³¹ *Verstehen* prevents us from speaking of numerical relative frequencies in the study of man because the principle of randomness is not fulfilled.

²⁹ Ibid., p. 27.

³⁰ Mises, Human Action, pp. 110-1.

³¹ Hans-Hermann Hoppe, "The Limits of Numerical Probability: Frank H. Knight and Ludwig von Mises and the Frequency Interpretation" *The Quarterly Journal of Austrian Economics* vol. 10, no. 1 (Spring 2007): 3-21.

The use of class probability in actuarial tables in life insurance does not invalidate our claim that it is only used in the natural sciences. The principle of insurance operates on the premise that only accidents are insurable. Accidents can only be external events, whether they are forces of nature or another human intentionally harming an insured party without the prior knowledge of the latter; accidents are events that are outside the realm of human choice. Thus, life insurance operates on the pooling of risks based on the biological, psychological, geographical, etc. (i.e., events in the Third Realm in addition to events outside a particular individual's choice). condition of an insured party. Moral hazard exists when insurance is provided for events that are under the control of the insured party.³²

6. A Theory of Foresight

With our insight into the workings of probability on both sides of the division of the principle of methodological dualism, we can now approach the most crucial question as to how precisely we act based on past information. In the natural sciences, our relationship to the future is probabilistic in nature. We can know the future only through relative frequencies of events; the most we can say with certainty is that we know the chances of an event occurring in the future. We will call this knowledge *probabilistic prediction*. In the study of man, we do not have the ability to know the future through numerical probabilities. Our *understanding* of past events aids in our *understanding* of future events in what we will call *anticipation*. Both of these concepts have been grouped under the umbrella of "prediction" for far too long. It only creates confusion when we use the same word to describe two radically different concepts. Frank H. Knight used the term *risk* to denote foresight with respect to case probability.³³ But even here, the conflation of risk and uncertainty in financial circles only confuses the topic.

We know that perfect knowledge of the future in the realm of human affairs is contradictory of the Action Axiom. But further proof of the impossibility of knowing the future actions of individuals is shown in the consequences of assuming that we can predict future human actions. Suppose we had a formula that claimed that a particular stock would sell off on some day in the future. With the knowledge that the stock collapse would occur on that day, everyone would sell the day before. But since everyone sold the day before, the price of a share of that stock would plummet

³² Fire insurance for an arsonist is a simple example of moral hazard resulting from the improper use of insurance. Fire insurance for the victim of an arsonist or a forest fire is the proper application of the principle of insurance.

³³ Frank H. Knight, Risk, Uncertainty, and Profit (Mineola, NY: Dover Publications, 2006).

on the day before. Knowing this, speculators would sell two days before, once again pushing the day of the selloff back one day. The date of the selloff will keep getting pushed closer and closer to the present until the collapse occurs at the time of the formula's inception. Thus the practical use of the formula that foretold the collapse is nil. Any method that predicts human behavior must also predict the reaction to the existence of the method. In short, any method or formula that supposedly grants perfect knowledge of the future runs into a circularity fallacy. In other words, the formula would have to predict the existence of a formula which means the formula is contained in itself—an absurdity, much like lifting myself up by my own bootstraps.

Probabilistic Prediction

Probabilistic prediction in the natural sciences is already strongly emphasized, and rightly so. The scientific method rests on the ability of experiments to show what will happen when some conditions are present. We can assume that all events have one cause.³⁴ But natural science is in a time where it reaches ultimate givens, beyond which is cannot pass or will not pass. Arguably, we will never know what caused the first cause because our rationality prevents us from comprehending the notion that a event does not itself have a cause. The use of probability helps circumvent this problem by substituting perfect knowledge (which will never be achieved) with a general idea of what will happen in the future. In some cases, the probability of an event is so close to 1 that it is, for all practical purposes, certain. But this must not be misconstrued to mean we know with certainty if it will happen; it simply means we can focus on other events, which may or may not happen. The sun, for instance, rises every day; so the ratio of observed sunrises to the total observations is 1. As we continue to observe sunrises the limiting value approaches the probability of a sunrise—a physical property of sunrises. Thus the sun rising tomorrow is, for all intents and purposes, "certain".

Using probabilistic prediction to foresee future human events is unsurprisingly impossible. Since humans can change their actions based on a change in present information, any prediction is always rendered obsolete as soon as it becomes present knowledge. Suppose we had some method of foreseeing future homicides and knew ahead of time the person who will be responsible, then intervention to arrest him will prevent the homicide from occurring which makes him innocent. Ethical implications aside, whether he had the intention of committing murder or not is pointless if

³⁴ We are not concerned with how the world appears to Laplace's Demon, which can apparently know all future natural phenomena assuming he has the complete knowledge of all present events, (Pierre Simon, Marquis de Laplace, *A Philosophical Essay on Probabilities* [New York, NY: J. Wiley, 1902]). Science, as we know it, is a purely human concept.

he did not actually commit murder. In human action, the act of prediction changes the outcome of an action given certain conditions. Prediction therefore is a self-defeating concept in the Inner Realm because natural scientific methods are incapable of accounting for choice.

Anticipation

Human action is not concerned with the past *per se*. The goal of human action is to take past³⁵ conditions and, with *Verstehen*, decide which future means are the best suited to the end preferred. The thymological category of *anticipation* is used in every action. Thinking of an action that did not use previous information is an absurd thought. *Anticipation* is categorically identical to historical understanding except that it is aimed at understanding future events. The entrepreneur is the market actor that specializes in the use of anticipation. But it must be emphasized that *Verstehen* and anticipation are not mutually exclusive. Entrepreneurs specialize in anticipation but that means they must use *Verstehen*. Richard C. Grimm proposes that there are two phases to accurately foreseeing the future from the perspective of an entrepreneur, what he calls the *research* phase and the *entrepreneurial* phase:

The research phase involves a study of past events. The beginning part of the phase is basically an investigation to uncover sources of information that can be used later in the process. Events of interest are identified based on their perceived relevance to understanding a current situation or potential use in helping accomplish a particular end in view. The researcher will attempt to understand the motivations for past actions that culminated in specific outcomes. Introspection is used to provide insights as to how and why actors arrived at certain choices and engaged in particular courses of action. Once the researcher determines that an adequate level of understanding has been acquired, the research phase ends and the entrepreneurial phase begins.

The entrepreneurial phase addresses the problem of understanding and anticipating the future. The knowledge and information acquired from the research phase is selectively applied to assess current circumstances as a precursor to anticipating future outcomes. During the entrepreneurial phase, the primary tool for anticipating the future is scenario analysis. This thymologic application is similar to the mental experiment (*Gedanken*) used in praxeology. In application, a number of scenarios are formulated along with an assessment of which alternative is most likely to occur.³⁶

³⁵ In human action, *past* means those actions, which have come to pass; *present* simply means actions, which are in still in motion; and *future* means those actions, which have yet to occur.

³⁶ Grimm goes on to point out that "[t]his process is similar to a popular view of entrepreneurial decision making outlined by Frank Knight (1965, pp. 227–228), who suggests that entrepreneurial choice culminates in a large number of scenarios and outcomes that forms a subjective probability distribution with the ultimate choice based upon the expected outcome. G. L. S. Shackle may provide a better representation of an Austrian application of entrepreneurial scenario analysis because he does not assume the formation of a probability distribution. Shackle suggests (1956, pp.

The entrepreneur uses historical facts to gather relevant through *Verstehen* which guides his anticipation of future events. Grimm's two phases importantly emphasize the importance of the division between the historical and future events.

The job of the entrepreneur is to allocate scarce resources—labor, capital goods, and natural resources—to best satisfy the wants of the consumers. It is clear that there is a thymological component in the job of the entrepreneur. In order to be able to satisfy the wants of the consumers he must know (or understand) what they are. This is precisely what anticipation is. Entrepreneurs use present day prices and attempt to make a profit by buying higher order goods and allocating them toward the production of goods that consumers will want in the future. He must anticipate what the consumer will want and arrange resources in a corresponding way.

Just as the ability to *understand* historical events varies between historians, the ability to anticipate is not equal in everyone. Some can get a more precise feeling of the situation and choose more correct means than someone who always seems to choose the wrong one. Entrepreneurship and anticipation are an art, so to speak. Thus, there is no objective way to say which method of anticipation is best.³⁷ It is up to the market to decide which entrepreneurs are using present resources to satisfy future needs in a way most suitable in the minds of consumers. The profit and loss mechanism of the market rewards more³⁸ correct anticipations and punishes more incorrect ones.

The Special Case of Praxeological Prediction

We have not mentioned yet how praxeology helps in the process of knowing the future. We showed earlier that all economic concepts are apodictically true of all actions—that includes future actions. An entrepreneur with knowledge of praxeological theory knows in advance the possible outcomes. Praxeological prediction is useful in narrowing down the infinite arrangement of future events. While it is inappropriate to speak of *probability* (in the mathematical sense discussed above) in the field of human action, we may, in this sense, speak of *possibility*—meaning praxeology eliminates

^{159–162)} that entrepreneurs create a number of mental scenarios and then choose a particular scenario to act upon based on their individual value scales." Richard C. Grimm, "Fundamental Analysis as a Tradition Austrian Approach to Common Stock Selection" *The Quarterly Journal of Austrian Economics* vol. 15, no. 2 (Summer 2012): 221-236.

³⁷ Grimm does show, however, that the fundamental analysis method of investing is consistent with Austrian economics, Grimm, Ibid. See also, Frank Shostak "In Defense of Fundamental Analysis: A Critique of the Efficient Market Hypothesis" *Review of Austrian Economics* vol. 10, no. 2 (1997): 27-45.

³⁸ We say "more" here because it is not necessary, for the entrepreneur, to be perfectly correct in his anticipations. All that is necessary, from the perspective of the consumers, is if he is *more* correct than other entrepreneurs.

certain events from even being achievable.

It must be stressed that praxeological prediction is qualitative. It speaks only of cause and effect and not of magnitude. We know that price rises, *ceteris paribus*, if supply falls. We cannot say, as economist, whether a 4% fall in supply will result in a 4% rise in price. We can only describe the qualitative results of a fall in supply. It is up to the entrepreneur to anticipate the particular aspects of the price, and it is also up to the entrepreneur to anticipate the extent to which other things will be equal.

We now can demonstrate what we have deduced with a hypothetical example of each type of foresight used in tandem. For example, suppose an entrepreneur armed with knowledge of weather systems knows the class probability of hurricane season affecting crops next summer. He may also know the praxeological category of price, that supply equilibrated with demand is the price of a good. He *predicts* that a hurricane will make landfall in a month's time and he *anticipates* it will cause a sizeable drop in the supply of his crops which will cause an increase in price, which he takes as an opportunity to store up extra crops this month to meet the dwindling supply next month. He is armed with historical and natural scientific knowledge, as well as praxeology. The deciding factor as to if this course of action is the correct one will be decided next month by if he makes a profit or not. Armed with theory, he has a much firmer grasp on what the correct course of action is.³⁹

7. Conclusion

We have seen that the process of knowing future events based on past information is crucial to both the science of human action and the natural sciences. Our terminological distinction between the two types of foresight helps differentiate the radically different processes of case and class probability. These two concepts fall right into the conception of the principle of methodological dualism, showing the far-reaching effects of the epistemological and practical necessities of separating the science of man and the science of nature. We may close by adding our theory of probability and foresight to our Austrian Three Realms what we have found in the theory of probability and foresight:

³⁹ The brilliant financial commentator Jim Grant phrased the importance of theory with the following metaphor: "When you have a theory to work from, you avoid the problem that comes with stumbling around in the dark over chairs and night stands. At least you can begin to visualize in the dark, which is where we all work... The future is always unlit. But with a body of theory, you can *anticipate* where the structures might lie. It allows you to step out of the way every once in a while. So I'd like to put in a plug, not just for the theory itself--as elegant as it is--but for the application of the theory for calling the turn of cycles in the workaday world." ("The Trouble with Prosperity" *The Austrian Economics Newsletter* Vol. 16, no. 4 [Winter 1996].)

	Private	Public	
Sensible		Outer Realm: Subject of the Natural Sciences. Primary method is observation, experimentation, and induction. Grouping of past informatino is by class probailit. Knolwedge of future conditions is only probable.	
Non- Sensible	Inner Realm: Subject of Thymology and History. Primary method is Verstehen. Grouping of past information is by case probability. Act of knowing the future is called anticipation.	Third Realm: Subject of a priori sciences including Mathematics, Logic, and Praxeology. Primary method is deduction. Praxeological prediction removes those future events that are not possible given our understanding of currenct conditions.	Principle of Methodological Dualism
	Division between 🗡 Theory and History		

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