

## Changes in Version 2006.01.04

### Chapter 1, Economics Blind Spot, fifth paragraph, second through eighth sentences

“Short setup times **have allowed Toyota to produce small batches of parts. In contrast, competitors with long setups may produce thirty or more days of parts. Long setup times call for large investments in warehouse space, material-handling equipment, material handlers, stock clerks, and other forms of indirect labor. Long setup times also create waste. When workers set up wrongly, they may need to scrap thirty or more days of parts. Further, long setups slow learning. It is much easier to remember the cause of a mistake made three hours ago than that of a mistake made three weeks ago.**”

were changed to:

“Short setup times call for **much smaller investments in warehouse space, material-handling equipment, material handlers, stock clerks, and other forms of indirect labor. Short setup times also reduce scrap. When production team members set up wrongly, they scrap far fewer parts. Short setups even enhance learning. It is much easier for team members to remember what they did wrong three hours ago than what they did wrong three weeks ago.**”

### Chapter 5, *Lower Barriers to Trade*

“**The history of the last three hundred years supports a cultural trend away from following traditions toward seeking pleasure. We see this trend clearly in England, where the cultural ideal changed from fulfilling one’s role in God’s plan to hedonist Jeremy Bentham’s “greatest good for the greatest number.” We have learned to associate this trend toward seeking pleasure with industrialization, urbanization, and globalization.**

“**We can tell many stories about why cultures become more hedonistic as they become more industrial. We can also tell many stories about why cultures are likely to become more lucid as they become more knowledge intensive. The practical question is not whether there is a trend toward living wisely but how best to promote this trend. Part of the solution must be to lower barriers to trade. Free trade promotes competition. Given a wise moral vision, competition promotes practical wisdom. Nothing is more useful to a human than another human guided by wisdom.**

“**A good example of a barrier to trade is the tax-free status of employee insurance benefits in the United States. This supposed benefit effectively takes away employees’ right to buy insurance from whomever they please. If people were free to buy insurance from any source, many would choose to buy it from sources that would help them live more wisely. Sources that successfully help their clients live more wisely**

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would pass the savings on to their clients, thereby attracting more people to their programs.”

were changed to:

“Free trade promotes competition. Given a wise moral vision, competition promotes practical wisdom.<sup>5</sup> Nothing is more useful to a human than another human guided by wisdom.

“From a Marxist view, free trade promotes the predominant mode of production, which in turn determines the culture. The logic of the industrial age holds that economies are like great machines in which people were interchangeable parts performing mindless tasks. Free markets call on people to seek pleasure, not to become fully human.

“The history of the last three hundred years supports the cultural trend away from following traditions toward seeking pleasure. We see this trend clearly in England, where the cultural ideal changed from fulfilling one’s role in God’s plan to hedonist Jeremy Bentham’s “greatest good for the greatest number.”

“The knowledge revolution has changed the logic of production. The logic of the knowledge age holds that economies are like great learning organisms in which people are the most important parts, the parts that learn. Free markets call on people to fulfill their natures, to become fully human. Given the logic of the knowledge age, lowering trade barriers promotes progress toward the Marxist normative end of all humans living fully human lives.”

“<sup>5</sup> A good example of a barrier to trade is the tax-free status of employee insurance benefits in the United States. This supposed benefit effectively takes away employees’ right to buy insurance from whomever they please. If people were free to buy insurance from any source, many would choose to buy it from sources that would help them live more wisely. Sources that successfully help their clients live more wisely would pass the savings on to their clients, thereby attracting more people to their programs.”

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### Changes in Version 2006.01.06

#### Chapter 1, title

Changed “Living Wisely” to “Practical Wisdom.”

#### Chapter 1, Concepts, title

Changed “Concepts” to “Living Wisely.”

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## Chapter 1, Living Wisely, first paragraph

Inserted the paragraphs:

“We live well by satisfying our needs for those things that we need to live well. We live wisely by continually improving the process of satisfying our needs for those things that we need to live well.

“Living wisely calls for thinking clearly about the process of satisfying our needs for those things that we need to live well. Thinking clearly about this process calls for the proper concepts for thinking about this process.”

## Chapter 1, Managerial Excellence, third paragraph, last sentence

“The distinction between managerial efficiency and effectiveness depends on the scale of the subordinate problem. What is a matter of efficiency at one problem scale is a matter of effectiveness at another. Imagine a hierarchical organization that defines the scale of subordinate problems in terms of each member’s freedom to decide. All organization members would seek to be efficient. All members with superiors would leave matters of effectiveness to their superiors. The distinction between efficiency and effectiveness would depend on one’s level in the hierarchy. *Failure to define a problem scale can cause great confusion.*”

returned to a footnote.

## Chapter 1, Managerial Excellence, last paragraph, second through sixth sentences

“We use these predictions to solve **given** problems. **We use these predictions to become more efficient.** In contrast, theories based on our natures help us to explain how to act wisely. We use these explanations to find better problems to solve. **We use these explanations to become more effective.**”

were changed to:

“We **ought to** use these predictions to solve **temporal** problems. In contrast, theories based on our natures help us to explain how to act wisely. We **ought to** use these **normative** explanations to find better **temporal** problems to solve.”

## Chapter 3, title

Changed “**Managerial** Concepts” to “**Normative** Concepts.”

## Chapter 3, Introduction, first paragraph

“This chapter puts forward **managerial** alternatives to the economic concepts of wealth, consumption, trade, production, and profit. **We use economic concepts to**

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construct *temporal* models, which help us to become more *efficient*. We use managerial concepts to construct *normative* models, which help us to become more *effective*.”

was changed to:

“*Wise managers use normative models to become more effective*. This chapter puts forward *normative* alternatives to the economic concepts of wealth, consumption, trade, production, and profit.”

### Chapter 6, first paragraph, first sentence

Inserted the sentences:

“We live well by satisfying our needs for those things that we need to live well. We live wisely by continually improving the process of satisfying our needs for those things that we need to live well.”

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### Changes in Version 2006.01.07

#### Appendix A, Ohno's Normative Vision, third paragraph

Changed “*manufacturing*” to “*production*” in the first sentence.

Changed “batch *production* systems” to “batch systems” in the second sentence.

#### Appendix A, Ohno's Normative Vision, fourth paragraph

Changed “*production operations*” to “*processes*” in the first sentence.

Changed “the *guiding principal of* continual improvement” to “continual improvement” in the first sentence.

Changed “*production* team members” to “team members” in the third sentence.

#### Appendix A, A Learning Worldview, fourth paragraph

Changed “*manufacturing*” to “*producing*” in the first sentence.

#### Appendix D, A More Detailed Normative View

“*Toyota production teams create and digest operational complexity*. They create *complexity by* folding parts of the production system in on itself. *Ignorance of how to manage* operational complexity creates uneven flow. Teams learn to manage

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complexity by finding and solving small problems that cause uneven flow. The goal is not smooth flow for its own sake. The goal is to produce ever more wisely.”

was changed to:

“**Taiichi Ohno’s vision involved** folding parts of the production system in on itself. **The resulting** operational complexity creates uneven flow. Teams learn to manage **this** complexity by finding and solving small problems that cause uneven flow. The goal is not smooth flow for its own sake. The goal is to produce ever more wisely.”

### Appendix D, Operational Complexity

Changed “**operations**” to “**processes**” in the first sentence (2 occurrences).

### Appendix D, *Operational Complexity*, title

Changed title from “*Operational Complexity*” to “*Types of Systems.*”

### Appendix D, *Types of Systems*, second through fifth paragraphs

“The simplest production systems are simple in form and in operation. They are simple in form in that they consist of one operation. They are simple in operation in that team members only face one choice, the rate at which the production system produces.

“Other systems are complex in form but simple in operation. They are complex in form in that they consist of more than one operation. They are simple in operation in that team members only face one choice, the rate at which the system produces. They consist of operations rigidly linked together into what is essentially a single complicated machine. These systems contain no flexible links.

“Still other systems are complex in form and in operation. They are complex in form in that they consist of more than one operation. They are complex in operation in they have at least one flexible production link choice. Team members must decide when and where to move product.”

were changed to:

“We can measure the complexity of production operations in two ways. We can count the number of production processes. By this measure, the simplest system is one that consists of a single process. Such a system is simple in *form*. We can also count the number of decisions that the production team face. By this measure, the simplest system is one that has only one decision. Such a system is simple in *operation*.

“The simplest system in operation is a “pull system” with no flexible links. A “pull system” is one in which customers “pull” product through the system. There is no

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production until there is a call for production from the customer. The customer, not the production team, sets the rate of production.”

### Appendix D, *Types of Systems*, last three paragraphs

“The traditional means of classifying production systems is by batch size, the quantity of identical items produced at one time. Batch sizes range from one to infinity. At the low end of this scale is *custom production*. At the high end of the scale is *continuous process production*. Between the two extremes is *batch production*. Batch production systems near the low end of the scale are more like custom production; those near the high end of the scale are more like continuous process manufacturing.

“Custom production is complex in form and operation. Its major advantages are flexibility and low capital costs. Most custom (job) shops use general-purpose machine tools grouped into departments by type of machine. Work flows from department to department. Capital costs tend to be low because general-purpose machine tools let operators to use the same tool to make a variety of parts. Further, there is little machinery for transferring work-in-process (WIP) from one operation to another. Offsetting these two advantages are high direct labor, waste, WIP holding, and indirect unit costs. Direct labor costs per unit are high because workers (1) require special skills, (2) spend much time setting up machines, and (3) waste time waiting for parts and work. Waste costs per unit are high because every tool setup is an opportunity to make mistakes. WIP holding costs per unit are high because flexible production links store WIP. Indirect costs per unit are high because flexible production links require more scheduling, material handling, accounting, and supervising.

“In contrast, continuous production processes, such as those that manufacture paper and paper clips, are essentially complicated machines. They are complex in form but not in operation. Compared to job shops, they sacrifice flexibility and capital to lower other costs.”

were changed to:

“We can also classify production systems by batch size, the quantity of identical items produced at one time. At the low end of this scale is *custom production*. At the high end of the scale is *continuous process production*. Between the two extremes is *batch production*.

“Traditional custom (job shop) production is complex in operation. Its major advantages are flexibility and low capital costs. Most job shops use general-purpose machine tools grouped into departments by type of machine. Work flows from department to department. Capital costs are low because workers use the same general-purpose tools to make a variety of parts. They also use little equipment to move (WIP) from one process to another.

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“The major disadvantage of job shops is their high cost per unit. Direct labor costs per unit are high because workers (1) need special skills; (2) spend much time setting up machines; and (3) waste time waiting for parts and work. Waste costs per unit are high because every tool setup is an opportunity to make mistakes. WIP holding costs per unit are high because flexible links store WIP. Decision related costs per unit are high because flexible links call for making decisions.

“In contrast, continuous production processes, such as paper mills, are relatively simple in operation. Compared to job shops, they sacrifice flexibility and capital to lower costs per unit.

“Batch production systems combine qualities of job shop and continuous processes. Those near the low end of the batch size scale are more like job shops. Those near the high end of the scale are more like continuous processes.”

### Appendix D, *Folding in Operations*

“Imagine a world in which operational simplicity trumps all other production concerns. Each final product would have its own river-like continuous production line. The pink, four-wheel drive, club cab, lemon yellow leather interior, diesel V8, pickup truck production line would have twenty-four identical wheel bolt assembly lines, six for each of the four wheels.

“In the real world, production teams balance the costs of managing operational complexity against other costs. Among other things, they group the production of identical parts together. In effect, they fold in identical parts of the imaginary river-like production line on top of each other.

“Production teams can also fold in similar parts of production process on top of each other. This is a matter of producing batches of identical parts on machine tools capable of producing a variety of similar parts. Producing in batches lowers the cost of capital equipment and raises the cost of direct and indirect labor.

“For the folding in to be wise, the benefits of folding in must be greater than the costs of folding in. The lower the production rate, the greater the relative benefits of folding in become. A job shop is simply countless continuous process production lines folded in on themselves.”

were changed to:

“Imagine a world in which operational simplicity trumps all other concerns. Each product would have its own “pull” system with no flexible links. The pink, four-wheel drive, club cab, diesel V8, pickup truck production line would have twenty-four identical wheel bolt subassembly lines, six for each of the four wheels.

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“In the real world, **operational complexity does not trump all other concerns**. Among other things, **engineers plan to produce identical parts on the same subassembly line**. In effect, they fold in identical parts of production lines on top of each other.

“**Engineers** can also fold in similar parts of production **lines** on top of each other. **They do this by planning to produce** batches of identical parts on machine tools capable of producing a variety of similar parts. For folding in to be wise, the benefits of folding in must be greater than the costs of folding in. The lower the production rate, the greater the relative benefits of folding in become.”

### Appendix D, *Smoothing Flows*, first paragraph

Changed “**smooth flows**” to “**the result of smoothing flows**” in the last sentence.

### Appendix D, *Smoothing Flows*, second paragraph

Changed “**custom and continuous process systems**” to “**job shops and continuous processes**” in the second sentence.

Changed “**intensively**” to “**to build a variety of parts**” in the third sentence.

Changed “**easily vary**” to “**vary its character by varying**” in the last sentence.

Changed “links” to “**flexible links**” in the last sentence.

### Appendix D, *Smoothing Flows*, last paragraph

“The Toyota system combines a simple, elastic, and robust means of linking **production operations** (dual kanban) with **the guiding principle of** continual improvement (kaizen). The elasticity of the links allows the system to stretch to fit problems that are too complex for **production** engineers to solve alone, **such as those created by folding in parts of the system**. Stretching these links **increases WIP and uneven flow in the flow** of WIP. Tightening stretched links uncovers small production problems that team members are able to solve. Solving these problems **reduces the WIP and uneven flow in the flow of WIP caused by ignorance of how to manage operational complexity**. The system swallows and digests complex problems much as a snake swallows and digests mice.”

was changed to:

“The Toyota system combines a simple, elastic, and robust means of linking **processes** (dual kanban) with continual improvement (kaizen). The elasticity of the links allows the system to stretch to fit problems that are too complex for engineers to solve alone. Stretched links **buffer the** uneven flow of WIP. Tightening stretched links uncovers small production problems that team members are able to solve. Solving these



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problems **smoothes** the flow of WIP. The system swallows and digests complex problems much as a snake swallows and digests mice.”

### Appendix D, *Production Links*, first paragraph

Changed “**operations**” to “**processes**” in the first sentence.

### Appendix D, *Production Links*, last paragraph

Changed “**production operations**” to “**processes**” in the third sentence.

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## Changes in Version 2006.01.07

### Appendix D, *Organization, Procedures, and Tools*, title

Changed title to “*Machine Tools*.”

### Appendix D, *Machine Tools*, first five paragraphs

“Toyota production lines form river-like structures. **Raw material inventories and receiving docks are the sources; parts fabrication and subassembly operations are the tributaries; and final assembly is the main channel.** Toyota machine tools are **similar to those of traditional job shops in that they are flexible and relatively inexpensive.** They are **often** simply modified versions of the same type **of machines** found in job shops. These modifications have three **major** ends: (1) automation, (2) fool-proofing, and (3) *rapid tool setting* (RTS).

“Toyota **approaches automation differently than traditional Western manufacturers do.** Rather than trying to get the most **production from** each machine, they try to get the most **production from** each full day’s work (the effort a person can put forth continuously without ill effect). Understanding this approach calls for understanding the benefits of *multimachine staffing*.

“Suppose that a **firm needs six semiautomatic machine tools to fulfill current production requirements and that each machine tool requires human attention for fifty seconds every three minutes.** The firm could assign six people to the process, one person to each machine tool. Alternatively, it could assign two people to two clusters of three machine tools. **This saves four full day’s work each shift.**

“This human centered approach **to automation makes it possible to accumulate fractions of a full day’s work.** This makes it possible to automate in small increments without wasting **labor** or creating uneven flows. **Automating in small increments makes it easier for production teams to target routine, difficult, and dangerous operations.** Routine operations are the least costly to automate, difficult ones exhaust a

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full day's work in less than a full day, and dangerous ones threaten precious human capital.

“Multimachine staffing also makes adding and removing people from a process easier, which lowers the cost of adjusting to fluctuations in production levels and the cost of inducing knowledge by removing people.”

were changed to:

“Toyota production lines form river-like structures. WIP flows from receiving docks to shipping docks. Production equipment and small storage areas define the channels. Here and there are U-shaped clusters of machine tools. Within these oxbows, one person runs many machine tools. Compared to Western firms, machine tools are more like those of job shops than those of continuous processes. Many are simply modified versions of the same types found in job shops. These modifications have three ends: (1) automation, (2) fool-proofing, and (3) rapid tool setting (RTS).

“From an industrial age view, factories are great machines in which people are interchangeable parts. The normative end is efficient production. From a knowledge age view, factories are learning organisms in which people are the most important part, the part that learns. The normative end is wise production. Toyota has a knowledge age view of automating tasks. Rather than trying to get the most out of each machine tool, they try to get the most out of each full day's work. A full day's work is the effort a team member can put forth over a long period without ill effect.

“Suppose that a line uses six machine tools run by six operators to produce wheel bolts. The Western approach to automating would be to replace these six machines with a single, fully automated machine capable of twice the production. The Toyota approach would be to modify the six machines so that they only call for a few seconds of human attention each minute. The team would then arrange these six machines in a cluster so that one or two people can run all six. This approach makes it possible to automate in small increments without wasting resources or creating uneven flows.”

### Appendix D, *Machine Tools*, sixth paragraph

Changed “Multimachine staffing” to “The human centered approach to automating” in the first sentence.

Changed “At Toyota, they call production on autonomous machines” to “Toyota team members call production on such machines” in the second sentence.

Changed “inexpensive” to “cheap” in the third sentence.

Changed “inexpensive” to “cheap” in the third sentence.

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## Appendix D, *Machine Tools*, sixth paragraph

Changed “inexpensive” to “cheap” in the third sentence.

Changed “worker” to “team member” in the fourth sentence.

Deleted the sixth sentence: “It consists of a scale built into the line and a relay attached to the mechanism that advances the package.”

Changed “the relay” to “a relay switch connected to a scale” in the last sentence.

Changed “mechanism from advancing” to “conveyer from moving” in the last sentence.

## Appendix D, *Machine Tools*, last four paragraphs

“Combining smooth flow with small batch size requires the ability to set up machine tools rapidly. Team members have learned many RTS techniques through experience, the simplest of which is dedicating machines to single items. Rather than setting up a machine to produce a given item, a team member simply walks over to the machine dedicated to that item. When these machines are not in use, they stand idle.

“The most important technique is adhering to a standard setup procedure. Good setup procedures separate tasks that workers can perform while the machine is running from those that require that the machine be idle. For example, the precise placement of tools and parts while the machine is running prevents searching for them while the machine is idle. Good procedures also use fool-proofing devices and color-coding to save time and reduce mistakes.

“Another technique is using separate front-end assemblies for each unique production operation that the machine tool performs. The goal is ending the need to make adjustments. To set up the machine tool, the operator simply removes one assembly and installs another. This technique raises capital costs, but not as much as dedicating entire machines to single items.

“Team members also create simple and inexpensive modifications to machine tools to promote RTS. These include replacing screws with wing nuts, welding wrenches to bolts, slotting safety guards for quick removal, and adding alignment pins to front end assemblies. Such simple modifications can cut setup times substantially.”

were changed to:

### “**Rapid Tool Setting**

Smooth flow calls for rapid tool setting (RTS). The simplest RTS technique is to use cheap machines that produce only one product. Rather than setting up a costly machine, the team member simply uses the appropriate cheap machine. A more

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common RTS technique is to build front-end assemblies for each product. To set up the tool, the team member simply removes one assembly and installs another. An even more common technique is to modify common job shop tools for RTS. Such modifications include replacing screws with wing nuts, welding wrenches to bolts, slotting safety guards for quick removal, and adding alignment pins to assemblies.

“The most common RTS technique is to adhere to a standard setup procedure. Good procedures separate tasks that team members can perform while the machine is running from those that call for the machine to be idle. For example, the precise placement of tools and parts while the machine is running prevents searching for them while the machine is idle. Good procedures also use color-coding to save time and fool-proofing devices to reduce mistakes.”

### Appendix D, *Production Links*, first two paragraphs

“Understanding the Toyota system calls for understanding the two ways the system links production processes. Production teams link some manufacturing operations tightly and rigidly to form tasks, which one or more people perform at a work center. They join these tasks with flexible links.

“Each link that joins tasks consists of containers suitable for storing and conveying one batch. These containers cycle back and forth between the supplying work center and consuming work center. Associated with each container are two cards (*kanban*) that clearly identify the item, batch size, the work center supplying the item, and the work center consuming the item. One card controls *production* at the supplying work center (the P-kanban) and the other controls *conveyance* between the two work centers (the C-kanban). For this reason, the Toyota system is also known as the dual kanban system.”

were changed to:

“Toyota engineers join production processes together in two ways. They join some processes tightly together into tasks, which one or more people perform at a work center. They join tasks together with flexible links.

“Each flexible link consists of containers suitable for storing and moving one batch of identical items. These containers cycle back and forth between the supplying work center and consuming work center. Associated with each container are two cards (*kanban*) that clearly identify the item, batch size, the supplying work center, and the consuming work center. One card controls *production* at the supplying work center (the P-kanban) and the other controls *conveyance* between the two work centers (the C-kanban).”

### Appendix D, *Production Links*, third paragraph

Changed “worker” to “team member” in the third and seventh sentences.

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Changed colons into semicolons in the fifth and last sentences.

### Appendix D, *Production Links*, last paragraph

“If the supplying center runs out of P-kanbans in its collection box or if these kanbans start to accumulate, the production link is out of balance. An out of balance link prompts the production team to look for a labor excellence problem. If the team cannot find a readily solvable problem, it tries to balance the process by shifting production operations from one work center to another. If it cannot do this, it adds a kanban pair (P- and C-kanban) to the link.”

were changed to:

“If the supplying center runs out of P-kanbans in its collection box or if these kanbans start to accumulate, the production line is out of balance. An out of balance line prompts the team to look for a problem to solve. If the team cannot find a readily solvable problem, it tries to balance the line by shifting processes from one work center to another. If the team cannot do this, it adds a kanban pair (P- and C-kanban) to the link. Adding kanban adds to the WIP buffer between the supplying and consuming work centers.”

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## Changes in Version 2006.01.10

### Chapter 2, *Normative Science*, last paragraph

“Science is nothing more than a refinement of everyday thinking. Temporal science is the result of the process of refining everyday thinking at a point in time. Normative science is the ever-evolving process of refining everyday thinking.”

was changed to:

“Worshippers of Newton confuse the results of science with the truth. They fail to distinguish between temporal science (the result of refining everyday thinking at a point in time) and normative science (the ever-evolving process of refining everyday thinking). Distinguishing between temporal science and normative science helps us to avoid confusing the results of science with the truth. It also provides us with a vision for improving science.”

### Appendix D, *Knowledge Induction*, title

Changed title to “*Inducing Knowledge*.”

### Appendix D, *Inducing Knowledge*

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“A production team can induce the creation of knowledge of how to produce using less WIP by removing kanban pairs from production links until one of the production links fails. If the team finds a readily solvable problem, it solves the problem, balances the process, and continues production. If not, it balances the process and continues. If the link continues to fail after repeated balancing, the team replaces the removed kanban pair and continues production.

“A production team induces knowledge by removing scarce resources from a complex process until the process fails, finding the problem that caused the failure, and solving that problem. The process must be complex enough that the team cannot find the problem at the time they remove the non-knowledge resource. If it could, it would simply solve the problem without suffering the cost of disrupting the process. Like athletic training, inducing knowledge has specific and general effects.”

“A team can induce knowledge of how to increase the efficiency of labor and capital by removing time from the production process. It does this by cutting the time required to produce a batch or by increasing the batch size without increasing the time allotted to produce a batch. Continuing to remove time eventually creates a problem - at least one team member will fall behind. This bottleneck may or may not produce a readily solvable problem. If the team discovers one, it solves the problem, balances the process, and continues production. If it fails to find one, it balances the process and continues production. If it fails after repeated tries, it returns to a slower pace. In theory, this cycle continues until the marginal cost of inducing knowledge equals its marginal benefit. Practice approximates this goal.

“Where removing time from a process increases labor efficiency, capital efficiency, and output, removing people increases labor efficiency without changing capital efficiency or output. As in removing time, removing people will eventually cause a problem. If the team discovers a readily solvable problem, it solves the problem, balances the process, and continues production. If it fails to find one, it balances the process and continues production. If it fails after repeated tries, it returns a person to the process.

“The team can also learn to produce using less WIP by removing kanban. Removing kanban increases the efficiency of capital without changing output. The procedure is similar to removing labor and time.

“All three of these types of induction expose efficiency problems and so tend to raise labor and capital efficiency. Because the cause of many efficiency problems is poor quality, inducing knowledge also tends to increase product quality, for example, parts that deviate from design specifications often take extra time to fit together. Correcting quality problems may require: (1) eliminating deviations from design specifications by changing standard procedures or by adding automation or fool-proofing devices, (2) tightening current design specifications, or (3) changing the product design.

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“Stressing the production system produces small manufacturing problems. These problems are not always obvious. To make sure that the team finds the problem that produces the best solution, companies train their teams to find problems. Techniques for finding problems range from statistical quality control methods to the Socratic *five whys*. By asking “Why?” at least five times, one may discover that the real cause of the labor efficiency problem in final assembly is a subassembly plant’s purchasing agent sleeping with an adhesive manufacturer’s representative.”

were changed to:

“WIP inventory buffers the uneven flow of WIP. It also hides problems to solve. A Toyota poster from the early eighties explained this to team members by comparing WIP inventory to water in a lake. Lowering the level of water in the lake uncovered hidden rocks.

“Teams lower WIP inventory by removing kanban pairs from the production line until one of the work centers falls behind. If the team finds a problem to solve, it solves the problem and continues producing. If not, it balances the line and continues producing. If the line continues to fail, the team replaces the kanban pair and continues producing.

“Removing kanban in order to find problems to solve is a means of inducing the creation of useful knowledge. We induce knowledge by (1) removing scarce resources from a complex process until the process fails; (2) finding the problem that caused the process to fail; and (3) solving the problem.

“Like athletic training, inducing knowledge has both specific and general effects. When removing kanban, the team learns how to produce using less WIP inventory. When removing labor, the team learns how to produce using less labor. When removing time (by directing more demand to the line), the team learns how to produce more without using more labor and capital. The general effects are raising product quality and improving adaptability.”

### Appendix D, *Visibility*, first paragraph

“Inducing knowledge is one means of finding problems. Another is making the production process as obvious as possible. The kanban system, low stock level markers, color coded stock areas, and production statistic charts near each work center help reveal the process to production supervisors and managers as they walk around the production area. Many plants also employ a lamp (*andon*) system to help them quickly assess the process from a distance. Each worker displays the status of his or her work center by turning on an overhead light. Sophisticated systems use different colored lights for different conditions. For example, a green light shows that all is going well; a yellow light warns that the worker is struggling to keep up; and a red light signals the need for immediate help. A well-run process displays green lights, a few yellow ones, and no red ones. Too many yellow lights signals trouble and all

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green lights shows the process is not being stressed enough to induce knowledge. Increasing visibility by these and other means makes it easier to find problems.”

was changed to:

“Stressing a complex system by removing scarce resources creates small problems. Techniques for finding these problems range from statistical quality control methods to the Socratic *five whys*. By asking “Why?” at least five times, one may discover that the real cause of a labor efficiency problem in final assembly is an affair between a purchasing agent and an adhesive sales representative. All of these techniques benefit from making the production system as transparent as possible.

“Production supervisors and managers also find problems to solve. Kanban, low stock level markers, color coded stock areas, and production statistic charts near each work center help them to do so. Many plants also employ a lamp (*andon*) system to help managers quickly assess stress from a distance. Each work center has an overhead status light. A green light shows that all is going well; a yellow light warns that the worker is struggling to keep up; and a red light signals the need for immediate help. All green lights shows that the process is not being stressed enough to induce knowledge. Too many yellow and red lights signals too much stress. Increasing visibility by these and other means makes it easier for supervisors and managers to find problems to solve.”

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### Changes in Version 2006.01.14

#### Chapter 2, Normative Science, last paragraph

Added (“a God’s eye view of the Universe”) to the first sentence.

#### Chapter 2, Refining Everyday Thinking, third paragraph

Italicized “*completely just*” in the fourth sentence.

Italicized “*completely ignorant*” in the fourth sentence.

#### Chapter 2, Refining Everyday Thinking, fourth paragraph

Italicized “*ever more*” in the second sentence.

#### Appendix D, *Types of Systems*, title

Changed title to “*Operational Complexity*.”

#### Appendix D, *Operational Complexity*, first two paragraphs



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“We can measure the complexity of production operations in two ways. We can count the number of production processes. By this measure, the simplest system is one that consists of a single process. Such a system is simple in *form*. We can also count the number of decisions that the production team face. By this measure, the simplest system is one that has only one decision. Such a system is simple in *operation*.

“The simplest system in operation is a “pull system” with no flexible links. A “pull system” is one in which customers “pull” product through the system. There is no production until there is a call for production from the customer. The customer, not the production team, sets the rate of production.

were changed to:

“We can measure the complexity of production operations by counting the number of decisions that the production team faces. The simplest system is a “pull system” with no flexible links. A “pull system” is one in which customers “pull” product through the system. There is no production until there is a call for production from the customer. The customer, not the production team, sets the rate of production. This simple system has only one decision, which is whether it is available to produce or not.

### Appendix D, *Operational Complexity*, last five paragraphs

“We can also classify production systems by batch size, the quantity of identical items produced at one time. At the low end of this scale is *custom production*. At the high end of the scale is *continuous process production*. Between the two extremes is *batch production*.

“Traditional custom (job shop) production is complex in operation. Its major advantages are flexibility and low capital costs. Most job shops use general-purpose machine tools grouped into departments by type of machine. Work flows from department to department. Capital costs are low because workers use the same general-purpose tools to make a variety of parts. They also use little equipment to move (WIP) from one process to another.

“The major disadvantage of job shops is their high cost per unit. Direct labor costs per unit are high because workers (1) need special skills; (2) spend much time setting up machines; and (3) waste time waiting for parts and work. Waste costs per unit are high because every tool setup is an opportunity to make mistakes. WIP holding costs per unit are high because flexible links store WIP. Decision related costs per unit are high because flexible links call for making decisions.

“In contrast, continuous production processes, such as paper mills, are relatively simple in operation. Compared to job shops, they sacrifice flexibility and capital to lower costs per unit.

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“Batch production systems combine qualities of custom and continuous process systems. Those near the low end of the batch size scale are more like job shops. Those near the high end of the scale are more like continuous processes.”

were moved down a section and changed to:

### “**Batch Size**

When production engineers expect production rates to be very low, they plan to produce in small batches on lines that are so greatly folded in that we no longer think of them as lines. When they expect rates to be very high, they plan to produce in very large batches on lines that are barely folded in. When they expect rates to be moderate, they plan to produce in batches on folded in lines.

Engineers classify production systems by batch size, the quantity of identical items produced at one time. At the low end of this scale is *custom production*. At the high end of the scale is *continuous process production*. Between the two extremes is *batch production*.

“Traditional custom (job shop) production is complex in operation. Its major advantages are flexibility and low capital costs. Most job shops use general-purpose machine tools grouped into departments by type of machine. Work flows from department to department. Capital costs are low because workers use the same general-purpose tools to make a variety of parts. They also use little equipment to move (WIP) from one process to another.

“The major disadvantage of job shops is their high cost per unit. Direct labor costs per unit are high because workers (1) need special skills; (2) spend much time setting up machines; and (3) waste time waiting for parts and work. Waste costs per unit are high because every tool setup is an opportunity to make mistakes. WIP holding costs per unit are high because flexible links store WIP. Decision related costs per unit are high because flexible links call for making decisions.

“In contrast, continuous production processes, such as paper mills, are relatively simple in operation. Compared to job shops, they sacrifice flexibility and capital to lower costs per unit.

“Batch production systems combine qualities of custom and continuous process systems. Those near the low end of the batch size scale are more like job shops. Those near the high end of the scale are more like continuous processes.”

### Appendix D, *Smoothing Flows*, second paragraph, last two sentences

“Like other batch systems, teams can vary its character by varying batch size. Unlike other batch systems, teams can vary its character by varying the tightness of its flexible links.”

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were changed to:

“Unlike other batch systems, teams can **control its operational complexity** by varying the tightness of its flexible links.”

### Appendix D, *Smoothing Flows*, last paragraph

“The Toyota system **combines a simple, elastic, and robust means of linking processes (dual kanban) with continual improvement (kaizen). The elasticity of the links allows the system to stretch to fit problems that are too complex for engineers to solve alone. Stretched links buffer the uneven flow of WIP. Tightening stretched links uncovers small production problems that team members are able to solve. Solving these problems smoothes the flow of WIP. The system swallows and digests complex problems much as a snake swallows and digests mice.**”

was changed to:

“**As described in the first appendix, the Toyota system swallows and digests problems too complex for production engineers to solve by themselves. Swallowing a complex problem is a metaphor for engineers implementing their crude solution to a complex problem. Engineers know that ignorance of how to deal with this complexity leads to the uneven flow of WIP. Engineers estimate how much uneven flow their crude solution will create. They then reduce expected uneven flow to manageable levels by stretching flexible links. The extra WIP inventory in stretched links buffers the uneven flow of WIP.**

“**Digesting complex problems is a metaphor for finding and solving small problems that create uneven flow. Solving these problems smoothes the uneven flow. It also improves procedures, machine design, trading relations, and product design.**

“**Putting these two processes together, engineers implement their crude solution to a complex problem. This crude solution creates uneven flow. The team solves small problems that create uneven flow. Solving these small problems embeds useful knowledge into the line. Once things are running smoothly, the team tightens one or more flexible links. This uncovers problems that create uneven flow. The team solves these problems. Once things are again running smoothly, the team tightens more links, which uncovers more problems to solve. This recursive process continues until the team can find no more problems to solve.**”

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### Changes in Version 2006.02.06

These changes were the result of my decision to restructure the paper based on the first two chapters of this work, which I submitted to the Institute for Coherence and Emergence (ISCE) for publication in their journal, *Emergence*. I made this decision after receiving

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feedback from an anonymous reviewer of the ISCE paper and after reviewing this feedback with Michael Lissack, the founder of ISCE. Their comments made me realize that the first two chapters were too much of a compromise between the lay and academic audiences. I needed to beef up the paper and slim down the book. In both cases, I needed to be much more wary of terms that carried too much baggage.

## Chapter 1, Living Wisely, title

Changed title to “**Setting Words Aright.**”

## Chapter 1, Setting Words Aright, first two paragraphs

“**We live well by satisfying our needs for those things that we need to live well. We live wisely by continually improving the process of satisfying our needs for those things that we need to live well.**

“**Living wisely calls for thinking clearly about the process of satisfying our needs for those things that we need to live well. Thinking clearly about this process calls for the proper concepts for thinking about this process.**”

were deleted.

## Chapter 1, Economics’ Blind Spot, title

Changed “Economics’ Blind Spot” to “**Modern** Economics’ Blind Spot.”

## Chapter 1, Excellence in Living Wisely, first paragraph, last two sentences

“In contrast, we commonly use the term ‘wise’ to describe people who are not only wise in satisfying their wants but are also wise in choosing them. **“Rational” people consume cigars efficiently. “Wise” people do not smoke.**”

was changed to:

“**Consuming cocaine efficiently is “rational.”** In contrast, we commonly use the term ‘wise’ to describe people who are not only wise in satisfying their wants but are also wise in choosing them. **Not consuming cocaine is wise.**”

## Chapter 2, Managerial Excellence, title

Changed title to “**Excellence in Living Wisely.**”

## Chapter 1, Excellence in Living Wisely, last two paragraphs

“**The terms ‘normative’ and ‘temporal’ have broader meanings. ‘Normative’ describes what is normal. It is normal for living things to follow their natures. ‘Normative’ also**

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prescribes norms. Living things owe it to themselves (ought) to follow their natures. ‘Temporal’ means worldly. When economists claim to be worldly philosophers, they accept splitting models based on our actions (revealed preferences) from models based on our natures. In modern terms, they accept splitting economics from moral philosophy.

“Theories based on our actions help us to predict how we will act. We ought to use these predictions to solve *temporal* problems. In contrast, theories based on our natures help us to explain how to act wisely. We ought to use these *timeless* explanations to find better *temporal* problems to solve. Given a concept of science based on what we need to live wisely, we will invent ever better means of testing both types of theories.”

were deleted.

## Chapter 2, Normative Science, title

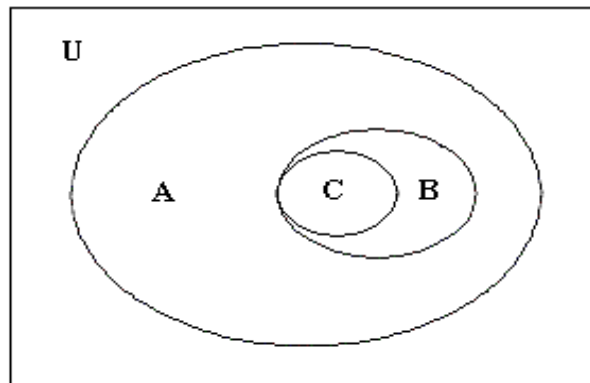
Changed title to “*The Process of Refining Everyday Thinking.*”

## Chapter 2, The Process of Refining Everyday Thinking, second paragraph

Changed “*philosophical*” to “*logical and elegant*” in the last sentence.

## Chapter 2, The Process of Refining Everyday Thinking, third and fourth paragraphs

“We further refine knowledge by testing theories against experience. Most specialists in testing theories believe that a good theory is a logical and elegant theory that we use to predict and explain a part of the Universe. They refine philosophical theories (B) by rejecting those that fail to meet empirical standards for predicting. What remains are scientific theories (C):



“Long ago members of the university of smiths, the university of tailors, and other craft guilds learned that their quality standards ought to reflect the needs of their customers rather than their own needs. Members of the university of scientists ignore

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this lesson at their peril. They are members of a guild, not a religious order. They ought to test theories based on the needs of those who use theories, not on their spiritual need to seek the truth. They ought to take to heart the story of John Harrison and the Board of Longitude.<sup>2</sup>”

“<sup>2</sup> The Board of Longitude unjustly denied John Harrison a prize for solving the longitude problem. Some sociologists believe that this was because Harrison, a commoner with no scientific training, was an outsider. More likely it was because his work did not advance the search for truth. Sociologists ought to recognize that Benjamin Franklin, who was one of the most celebrated scientists at the time, was also a commoner with no scientific training. For more on John Harrison and the longitude prize, see the British National Maritime Museum’s website, <<http://www.nmm.ac.uk/server/show/conWebDoc.355>> (28 November 2005).”

were deleted.

### Chapter 2, The Process of Refining Everyday Thinking, new fourth paragraph

“We live in a complex world. If we are to live wisely, we need to test theories by how well they perform their roles in decision-making. We need to refine narratives (A) by **rejecting** those that fail to meet our empirical standards for predicting. What remains are **scientific theories** that we use to predict (C<sub>1</sub>). **This set includes quantum mechanics and marginalist economics.** We also need to refine **philosophical** theories (B) by **rejecting** those that fail to meet our empirical standards for helping us find problems to solve. What remains are **scientific** theories that we use to explain (C<sub>2</sub>). **This set includes Charles Darwin’s theory of evolution, Alfred Wegener’s theory of plate tectonics, and Edward Witten’s M-theory of physics:**”

were changed to:

“We live in a complex world. If we are to live wisely, we need to test theories by how well they perform their roles in decision-making. We need to refine narratives (A) by **culling out** those that fail to meet our empirical standards for predicting. What remains are **tested narratives** that we use to predict (C<sub>1</sub>). We also need to refine **logical and elegant** theories (B) by **culling out** those that fail to meet our empirical standards for helping us find problems to solve. What remains are **tested logical and elegant** theories that we use to explain (C<sub>2</sub>):”

### Chapter 2, The Process of Refining Everyday Thinking, last three paragraphs

“Newton’s theories greatly expanded the depth and breadth of Kepler’s theory. We would have accepted them as tools for predicting and as tools for explaining. However, we would not have deemed them the sacred truth as Alexander Pope did in his intended epitaph for Newton:

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Nature and Nature's laws lay hid in night:  
God said, "Let Newton be!" and all was light.

"Physicists today know that the universe is not as predictable as those who worship at Newton's shrine believe it to be. Among other things, large asteroids occasionally collide with the earth, devastating its higher forms of life.

"Worshippers of Newton confuse the results of science with the truth ("a God's eye view of the Universe"). They fail to distinguish between temporal science (the result of refining everyday thinking at a point in time) and normative science (the ever-evolving process of refining everyday thinking). Distinguishing between temporal science and normative science helps us to avoid confusing the results of science with the truth. It also provides us with a vision for improving science."

were changed to:

"We can interpret Einstein's definition of science two ways. If we interpret the term 'refinement' to mean the results of refining, science is the result of refining everyday thinking. Science concerns theories. If we interpret the term 'refinement' to mean the process of refining, science is the ever-evolving process of refining everyday thinking. Science concerns research programs. If we fail to distinguish between these two definitions of science, we are likely to confuse current scientific theories with the truth rather than an assay of the truth.<sup>4</sup> Again, the wise man says, "I am looking for the truth," and the fool, "I have found the truth.""

<sup>4</sup> To confuse a scientific theory with the truth is to make the philosophical mistake of confirming the consequent. Formally, (1) if A is true, B is true; (2) B is true; therefore (3) A is true. For example, (1) if it rains, the ground is wet; (2) the ground is wet; therefore, (3) it rained. This bit of foolishness ignores dew, sprinkler systems, melting snow, and countless other things that make the ground wet. As Karl Popper observed, we cannot prove scientific theories true, we can only prove them false."

### Chapter 2, Economic Science, fourth paragraph, new fifth footnote

Changed "associate" to "are likely to associate" in the first sentence.

Changed "associate" to "are likely to associate" in the second sentence.

### Chapter 2, Economic Science, fifth paragraph, last sentence

"We ought to distinguish between *temporal tools* and *normative tools*."

was deleted.

### Chapter 2, Economic Science, sixth paragraph, second sentence

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Changed “the **study** of the **scientific** research program” to “the **research program** of the research program” in the first sentence.

### **Chapter 2, Refining Everyday Thinking, first paragraph**

Changed “culling” to “culling **out**” in the last sentence.

### **Chapter 2, Refining Everyday Thinking, second paragraph**

Changed “cull” to “cull **out**” in the first sentence.

Changed “cull” to “cull **out**” in the second sentence.

### **Chapter 2, Refining Everyday Thinking, second paragraph, third sentence**

“**We ought to cull those based solely on sociobiology, which consider only our bodies; those based solely on postmodernism, which consider only our minds; and those based solely on our need to relink with the infinite Being, which consider only our spirits.**”

was deleted.

### **Chapter 2, Refining Everyday Thinking, third paragraph**

Changed “cull” to “cull **out**” in the first sentence.

### **Chapter 2, Refining Everyday Thinking, fourth paragraph**

Changed “culling” to “culling **out**” in the first sentence.

Changed “cull” to “cull **out**” in the second sentence.

Changed “cull” to “cull **out**” in the third sentence.

### **Chapter 2, Refining Everyday Thinking, last paragraph**

Changed “cull” to “cull **out**” in the first sentence.

### **Chapter 3, title**

Changed “**Normative** Concepts” to “**Timeless** Concepts.”

### **Chapter 3, Introduction, first paragraph**

Changed “**normative models**” to “**timeless intellectual tools**” in the first sentence.

Changed “**normative**” to “**timeless**” in the second sentence.



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Changed “economic” to “**modern** economic” in the second sentence.

### **Chapter 3, Wealth, first paragraph**

Changed “Economists” to “**Modern** economists” in the first sentence.

Changed “Economists” to “**Modern** economists” in the second sentence.

### **Chapter 3, Consumption, first paragraph**

Changed “economists” to “**modern** economists” in the first sentence.

### **Chapter 5, *Consider the Justice of Interventions*, last paragraph**

Changed “New Deal farm programs” to “**Though often changed in form**, New Deal farm programs” in the last sentence.

### **Appendix A, Ohno’s Normative Vision, title**

Changed title to “**Ohno’s Vision.**”

### **Appendix D, A More Complete Normative View, title**

Changed title to “**A More Complete Timeless View.**”

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## **Changes in Version 2006.02.24**

### **Acknowledgements, fourth paragraph**

Changed title to “**and the possibility of losing my acceptances to the Stanford and Harvard graduate schools of business,**” in the eighth sentence.

### **Chapter 1, Excellence in Living Wisely, first paragraph**

Reversed the order of the second and third sentences.

### **Chapter 2, The Process of Refining Everyday Thinking, title**

Deleted “**The Process of.**”

### **Chapter 2, Refining Everyday Thinking, last paragraph**

“**We can interpret Einstein’s definition of science two ways. If we interpret the term ‘refinement’ to mean the results of refining, science is the result of refining everyday**”

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thinking. Science concerns theories. If we interpret the term ‘refinement’ to mean the process of refining, science is the ever-evolving process of refining everyday thinking. Science concerns research programs. If we fail to distinguish between these two definitions of science, we are likely to confuse current scientific theories with the truth rather than an assay of the truth.<sup>4</sup> Again, the wise man says, “I am looking for the truth,” and the fool, “I have found the truth.””

was deleted.

### Chapter 2, Economic Science, title

Changed title to “Science as a Process.”

### Chapter 2, Research Programs, second paragraph, last two sentences

“One of the most valuable results of this ongoing research program was the division of labor. The division of labor has led to countless other inventions. These include ever more sophisticated (1) tools for enhancing our senses (telescopes, microscopes, thermometers, atomic clocks, radar); (2) tools for enhancing our common sense (formal logic, algebra, analytical geometry, calculus, statistical analysis, computer simulation); and (3) testing strategies (reductionism, pragmatism, instrumentalism).”

were changed to:

“One of the most valuable results of this ongoing research program was the division of labor, which has given us specialized producers of goods and services, including intellectual tools.

“Most producers of tested intellectual tools base their concept of quality on technical excellence. In contrast, most other producers base their concept of quality on a combination of technical excellence and usefulness. They recognize that a technically perfect brass watermelon is still a brass watermelon, something that consumers neither need nor want.

“The solution to this tunnel vision problem is to define science to be the ever-evolving process of refining everyday thinking.<sup>4</sup> This definition provides us with a vision of how best to improve the process of refining everyday thinking. It also reminds us that the products of science are useful assays of the truth rather than the truth itself.<sup>5</sup>

“<sup>4</sup>The belief that science is the result rather than the process of refining thinking tends to blind us to the possibility of learning. It does not take a theory to beat a theory. It takes an intellectual tool to beat an intellectual tool. A strategy for learning (research program) can beat a theory.

“<sup>5</sup>We base theories on assumptions. Not all of these assumptions are testable. To confuse a scientific theory with the truth is to make the philosophical mistake of

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confirming the consequent. Formally, (1) if A is true, B is true; (2) B is true; therefore (3) A is true. For example, (1) if it rains, the ground is wet; (2) the ground is wet; therefore, (3) it rained. This bit of foolishness ignores dew, sprinkler systems, melting snow, and countless other things that make the ground wet. Testing the consequences of a theory does not test its assumptions.”

### “Economic Science

Nowhere is the need for this change more pressing than in the field of economics. Most economists believe that economics involves testing logical and elegant models that explain by how well they predict. Economists using this method presume that theories that predict well also explain well. As we saw in the EOQ example, this is not the case. We predict what happens in economies based on the knowledge that economic agents possess. If we explain what happens in economies based on the knowledge that economic agents possess, we will tend to blind ourselves to the possibility of learning. To avoid this, we need to explain what happens in economies based on how we would act if we had greater knowledge of what we ought to do. In other words, we need to explain based on how the wise would act.”

### Chapter 2, Economic Science, new second paragraph, first two sentences

“Specialists have long struggled with how best to explain human action. The greatest difficulty in studying human action is the complex (reflexive<sup>5</sup> / recursive) dynamic between the intellectual tools that we use to guide our actions and reality.”

were changed to:

“To make matters worse, there is a complex (reflexive<sup>6</sup> / recursive) dynamic between the intellectual tools that we use to guide our actions and reality.”

### Chapter 2, Economic Science, new third paragraph, third sentence

“The first is their tendency to become more popular.”

was changed to:

“The first is their tendency to become more popular, which is in part due to the lock-in effect created by the inexhaustibility of knowledge.”

### Chapter 2, Economic Science, last two paragraphs

“We predict what happens in economies based on the knowledge that economic agents possess. If we explain what happens in economies based on the knowledge that economic agents possess, we will tend to blind ourselves to the possibility of learning. To avoid this, we need to explain what happens in economies based on how we would act if we had greater knowledge of what we ought to do. In short, we need to explain based on how the wise would act. Until all of us act wisely, we ought to distinguish

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between intellectual tools for helping us to predict, which help us evaluate alternatives, and intellectual tools for helping us to explain, which help us formulate alternatives.

“Fifty years ago, Milton Friedman defined (positive) economic science as “a body of tentatively accepted generalizations about economic phenomena that can be used to predict the consequences of changes in circumstances.”<sup>7</sup> He warned economists not to use their (positive) theories to formulate alternatives. A more complete approach is to define economic science as the research program of the research program of, by, and for intelligent life. Economic science ought to be the premier *intelligent life science*.

<sup>7</sup> Friedman, Milton, “The Methodology of Positive Economics,” *Essays in Positive Economics*, (Chicago: University of Chicago Press, 1953), 39.”

were changed to:

“To address this problem, economists ought to define economic science to be the science of practical wisdom, the research program of the research program of, by, and for intelligent life.<sup>8</sup> Economic science ought to be the premier *intelligent life science*.

<sup>8</sup> The research program of, by, and for intelligent life describes the world as it is in the process of becoming. From the positivist view of modern economics, it is positive in ends (describing the world as it is) and normative in means (prescribing the means of improving our descriptions of the world).”

### Chapter 2, Refining Everyday Thinking, title

Changed title to “Refining Theories That Explain.”

### Chapter 2, Refining Theories That Explain, last paragraph

“The theories that remain after we cull out misleading and unethical theories deserve our tolerance. We base this tolerance on our ignorance of how best to live wisely rather than on the right to do as we please.”

was changed to:

“Logical and elegant theories for living wisely stand ready to be proven less useful than other theories in helping us to find problems to solve in the quest to live wisely.<sup>13</sup> We can test these theories by creating an environment in which researchers - all of us - are free to choose which of these theories to test with our lives.<sup>14</sup> Those that fellow researchers test with their lives deserve our tolerance. We base this tolerance on our ignorance of how best to live wisely rather than on the right to do as we please.”

<sup>13</sup> All technical means of testing these theories involve choosing a measure for living wisely. Choosing the best measure for living wisely is part of the research program of,

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by, and for intelligent life. Candidates include such measures as personal income, changes in per capita national income, personal assessments of well-being, and average lifespan. We can argue endlessly about the worth of these measures. For some people with a results-oriented view of science, these theories are nothing more than moral philosophy. For others with a results-oriented view of science, these theories are pseudoscience. For those people with a process-oriented view of science, these theories are simply theories that we cannot yet test by technical means.”

### Chapter 3, *Three Common Misbeliefs*, last paragraph

Changed “hundreds of millions” to “millions” in the second sentence.

### Appendix C, first two paragraphs

“Imagine a pill that improves practical wisdom. The immediate effect of releasing this product would be a drop in the demand for some goods and a rise in the demand for others. Some parts of the economy would contract and other parts would expand. Resources would flow from the contracting sectors to the expanding ones. This adjustment process would be neither immediate nor costless. Economists would record an immediate fall in aggregate production and rise in unemployment. Economic science would portray one of the most important advances in human history as a disaster.

“Economists recognize problems in measuring services and improvements in quality. However, they do not recognize that all consumer goods and services are means to living wisely. The problem of measuring services is universal. Worse, the problem of measuring quality is far more difficult than economists believe it to be.”

were changed to:

“Imagine a pill that improves practical wisdom. Releasing this product would change how people choose to live. Some parts of the economy would shrink and other parts would grow. Resources would flow from the shrinking parts to the growing ones. The immediate effect would be a fall in aggregate production and a rise in unemployment. Modern economic science would portray one of the greatest advances in human history as a disaster.

“The problem is one of measuring what we need to live wisely. Most modern economists recognize problems in measuring services and improvements in quality. However, they deny that all goods and services are means to living wisely. The problem of measuring services is universal. Worse, the problem of measuring quality is much harder than most modern economists believe it to be.”

### Appendix D, A More Detailed Timeless View, title

Changed title to “A Finer Timeless View.”

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## Appendix D, *Batch Size*, first paragraph

“When production engineers expect production rates to be very low, they plan to produce in small batches on lines that are so greatly folded in that we no longer think of them as lines. When they expect rates to be very high, they plan to produce in very large batches on lines that are barely folded in. When they expect rates to be moderate, they plan to produce in batches on folded in lines.”

was moved up to the end of the previous section, *Folding In Operations*.

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## Changes in Version 2006.02.28

### Chapter 1, *Setting Words Aright*, last paragraph, first two sentences

“The inexhaustibility of knowledge gives knowledge in use an advantage over knowledge not yet in use. **When we combine knowledge into a network, this local “lock-in” effect can become large.**”<sup>2</sup>

<sup>2</sup> Arthur, W. Brian, “Positive Feedback in The Economy,” *Scientific American*, Feb. 1990, 92-99, reprinted in *Increasing Returns and Path Dependence in the Economy*, (Ann Arbor: University of Michigan Press, 1994).”

were changed to:

“The inexhaustibility of knowledge gives knowledge in use an advantage over knowledge not yet in use.”

“**When we combine knowledge into a network, this local “lock-in” effect can prevail over superior knowledge not yet in use.** Arthur, W. Brian, “Positive Feedback in The Economy,” *Scientific American*, Feb. 1990, 92-99, reprinted in *Increasing Returns and Path Dependence in the Economy*, (Ann Arbor: University of Michigan Press, 1994).”

### Chapter 1, *Excellence in Living Wisely*, second paragraph

Moved the footnote from the end of the last sentence to the end of the second to last sentence.

### Chapter 1, *Deciding Wisely*, last paragraph, last sentence

“Practical wisdom, trust, liberty, and capital are strategic assets **in living wisely.**”

was changed to:

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“In the quest to live wisely, practical wisdom, trust, liberty, and capital are strategic assets.”

### Chapter 2, Refining Theories That Explain, first paragraph

Inserted the paragraph:

“The research program of, by, and for intelligent life includes both theories that predict, which we use to evaluate alternatives, and theories that explain, which we use to formulate alternatives. We test theories that predict by testing how well they predict.<sup>9</sup> We test theories that explain by how well they help us to find problems to solve in the quest to live wisely.

“<sup>9</sup> This is compatible with the instrumental interpretation of Milton Friedman’s definition of positive economic science as “a body of tentatively accepted generalizations about economic phenomena that can be used to predict the consequences of changes in circumstances.” Friedman, Milton, “The Methodology of Positive Economics,” *Essays in Positive Economics*, Chicago: University of Chicago Press, 1953), 39.”

### Chapter 2, Refining Theories That Explain, new third paragraph, last sentence

Added the footnote:

“<sup>13</sup> Our needs for such things as nutrition and water arise on the level of our bodies. Our needs for such things as affection and esteem arise on the level of our minds. Our needs for such things as the longing to mystically link with something greater than ourselves arise on the level of our spirits. Until we thoroughly understand the complex relations that link our bodies, minds and spirits, we ought to cull out all teleonomic theories that focus on any one of these levels of abstraction. Focusing on any one of these levels will tend to blind us to needs that emerge on other levels.”

### Chapter 3, Introduction, first paragraph

Changed “timeless intellectual tools” to “timeless concepts derived from the normative end of living wisely” in the first sentence.

### Chapter 3, Profit, fourth footnote

Changed “normative” to “timeless” in the second sentence.

### Chapter 3, Profit, first paragraph

Changed “acting wisely” to “living wisely” in the second sentence.

### Chapter 4, Uneven Flow

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Reversed the order of the second and third paragraphs.

Changed “flows” to “flow” in all (6 occurrences).

### **Chapter 5, *Lower the Barriers to Trade*, second paragraph, last sentence**

“Free markets call on people to seek pleasure, not to become fully human.”

was changed to:

“Industrial age culture call s on people to seek pleasure, not practical wisdom.”

### **Chapter 5, *Lower the Barriers to Trade*, last paragraph**

Changed “the logic of the knowledge age” to “the new logic” in the second sentence.

“Free markets call on people to fulfill their natures, to become fully human.”

was changed to:

“Knowledge age culture call s on people to seek practical wisdom, not pleasure.”

Changed “the logic of the knowledge age” to “this new logic” in the last sentence.

### **Appendix D, *Uneven Flow*, second footnote, last sentence**

“Most of this material first appeared in the 1992 version of *Wealth in the Information Age, A Humanistic Approach to Economics*.”

was deleted.

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## **Changes in Version 2006.03.03**

### **Chapter 2, *Refining Theories That Explain*, third paragraph**

Changed “theories” to “members of this set” in the first sentence.

### **Chapter 2, *Refining Theories That Explain*, fourth paragraph**

Changed “theories” to “members of this set” in the first sentence.

### **Chapter 2, *Refining Theories That Explain*, fifth paragraph**



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“If we can agree that to live wisely is to revere life, then we can develop rules for culling out unethical theories. For example, we can cull out those that **fail to call on us to live ever more wisely. We can also cull out those that** define who “we” are too narrowly.”

was changed to:

“If we can agree that to live wisely is to revere life, then we can develop rules for culling out unethical **teleonomic** theories. For example, we can cull out those that define who “we” are too narrowly.”

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### Changes in Version 2006.03.06

#### Acknowledgments, eighth paragraph

Added “**“from the heart”**” to the last sentence.

#### Chapter 5, *Lower Barriers to Trade*, last three paragraphs

“From a Marxist view, **free trade promotes** the predominant mode of production, **which in turn** determines the culture. The logic of the industrial age holds that economies are like great machines in which people are interchangeable parts performing mindless tasks. Industrial age culture calls on people to seek pleasure, **not practical wisdom.**”

“**The history of the last three hundred years** supports this view. **There has been a** cultural trend away from following traditions toward seeking pleasure. We see this trend clearly in England, where the cultural ideal changed from fulfilling one’s role in God’s plan to hedonist Jeremy Bentham’s “greatest good for the greatest number.”

“The knowledge revolution has changed the logic of production. The new logic holds that economies are like great learning organisms in which people are the most important parts, the parts that learn. Knowledge age culture calls on people to seek **practical wisdom, not pleasure.** Given this new logic, lowering trade barriers promotes progress toward the Marxist normative end of all humans living fully human lives.”

were changed to:

“From a Marxist view, the predominant mode of production determines the culture. The logic of the industrial age holds that economies are like great machines in which people are interchangeable parts performing mindless tasks. Industrial age culture calls on people to seek pleasure.<sup>6</sup>”

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“The knowledge revolution has changed the logic of production. The new logic holds that economies are like great learning organisms in which people are the most important parts, the parts that learn. Knowledge age culture calls on people to seek **to live wisely**. Given this new logic, lowering trade barriers promotes **the predominant mode of production, which in turn promotes** progress toward the normative end of all humans living fully human lives.”

“**Supporting this materialist view is the** cultural trend away from following traditions toward seeking pleasure. We see this trend clearly in England, where the cultural ideal changed from fulfilling one’s role in God’s plan to hedonist Jeremy Bentham’s “greatest good for the greatest number.””

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## Changes in Version 2006.03.14

### Preface, second paragraph

Changed “**intellectual** tools” to “**analytical** tools” in the third and last sentences.

### Chapter 2, Refining Everyday Thinking, fourth paragraph

Changed “**narratives**” to “**theories**” in the fourth sentence.

Changed “**logical and elegant** theories” to “theories” in the last sentence.

### Chapter 2, Science as a Process, first paragraph, last sentence

Added the footnote:

“**The research program of, by, and for intelligent life describes the world as it is in the process of becoming. From the positivist view of modern economics, it is positive in ends (describing the world as it is) and normative in means (prescribing the means of improving our descriptions of the world).**”

### Chapter 2, Science as a Process, third paragraph, seventh footnote

Changed “**George Hegel’s internal contradictions of theories**” to “Hegel’s **dialectic**” in the first sentence.

### Chapter 2, Economic Science, last paragraph

Changed “EOQ” to “EOQ/**RTS**” in the fourth sentence.

### Chapter 2, Economic Science, last paragraph

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“To address this problem, economists ought to define economic science to be the science of practical wisdom, the research program of the research program of, by, and for intelligent life.<sup>9</sup> Economics science ought to be the premier *intelligent life science*.”

“<sup>9</sup> The research program of, by, and for intelligent life describes the world as it is in the process of becoming. From the positivist view of modern economics, it is positive in ends (describing the world as it is) and normative in means (prescribing the means of improving our descriptions of the world).”

was changed to:

“Living wisely is a process. Like the problem of how best to improve the process of building cars, the problem of how best to improve the process of living wisely is an open-ended one. As we saw in the EOQ/RTS example, there are two basic methods of “solving” an open-ended problem. The first (EOQ) method is to reduce the open-ended problem to a finite model. The second (RTS) method is to devise a research program for how to improve the process of solving the open-ended problem.<sup>9</sup>

“For economic science as a whole, it is foolish to conflate these two methods. It is foolish to base the research program that defines economic science on a finite model. Doing so will tend to blind us to better problems to solve. Economic science ought to include both theories that predict what happens in economies<sup>10</sup> and theories that explain how to live wisely. We ought to use predictions to help us evaluate alternatives and explanations to help us formulate them.”

“<sup>9</sup> Mathematicians face a similar (open-ended) problem when they seek to evaluate the transcendental number pi. Rather than seeking ever better rational approximations of pi: 3, 22/7, 355/113, ..., they seek ever better recursive processes for calculating pi:  $\pi = 4(1 - 1/3 + 1/5 - 1/7 + 1/9 - 1/11 + \dots)$ ;  $\pi = 2 \cdot \sqrt{3}(1 - 1/3 \cdot 3 + 1/5 \cdot 3^2 - 1/7 \cdot 3^3 + 1/9 \cdot 3^4 - 1/11 \cdot 3^5 + \dots)$ ; ..., where better recursive processes are those that converge more quickly.”

“<sup>10</sup> We ought to test theories that we use to predict what happens in economies by how well they help us to predict what happens in economies. This is compatible with the instrumental interpretation of Milton Friedman’s definition of positive economic science as “a body of tentatively accepted generalizations about economic phenomena that can be used to predict the consequences of changes in circumstances.” Friedman, Milton, “The Methodology of Positive Economics,” *Essays in Positive Economics*, (Chicago: University of Chicago Press, 1953), 39.”

### Chapter 2, Refining Theories That Explain, title

Changed title to “*Refining Theories That We Use to Explain*.”

### Chapter 2, *Refining Theories That We Use to Explain*, first paragraph

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“The research program of, by, and for intelligent life includes both theories that predict, which we use to evaluate alternatives, and theories that explain, which we use to formulate alternatives. We test theories that predict by testing how well they predict.<sup>9</sup> We test theories that explain by how well they help us to find problems to solve in the quest to live wisely.”

<sup>9</sup> This is compatible with the instrumental interpretation of Milton Friedman’s definition of positive economic science as “a body of tentatively accepted generalizations about economic phenomena that can be used to predict the consequences of changes in circumstances.” Friedman, Milton, “The Methodology of Positive Economics,” *Essays in Positive Economics*, (Chicago: University of Chicago Press, 1953), 39.”

was changed to:

“Logical and elegant theories that we use to explain how best to live wisely stand ready to be proven less useful than similar theories in helping us to find problems to solve. Regrettably, we cannot test these theories in the same way that we test the theories that we use to predict what happens in economies. This is because we do not know, and will never know with certainty, what it is to live wisely.

“Toyota provides us with a very different model for testing these theories. At Toyota, specialists help to create an environment in which team members solve problems that are too complex for specialists to solve by themselves. Specialists then help team members to improve the process of solving problems by helping team members to improve their problem solving skills and methods. Following this example, specialists can help to create an environment in which all of us test theories that we use to explain how best to live wisely. Specialists can then help us to improve the process of testing these theories by helping us to improve our research skills and methods.

“This means of testing theories requires more than free markets. It requires a vision for what we ought to do.”

### **Chapter 2, *Refining Theories That We Use to Explain*, last paragraph**

“Logical and elegant theories for living wisely stand ready to be proven less useful than other theories in helping us to find problems to solve in the quest to live wisely. We can test these theories by creating an environment in which researchers - all of us - are free to choose which of these theories to test with our lives.<sup>15</sup> Those that fellow researchers test with their lives deserve our tolerance. We base this tolerance on our ignorance of how best to live wisely rather than on the right to do as we please.”

<sup>15</sup> All technical means of testing these theories involve choosing a measure for living wisely. Choosing the best measure for living wisely is part of the research program of, by, and for intelligent life. Candidates include such measures as personal income, changes in per capita national income, personal assessments of well-being, and

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average lifespan. We can argue endlessly about the worth of these measures. For some people with a results-oriented view of science, these theories are nothing more than moral philosophy. For others with a results-oriented view of science, these theories are pseudoscience. For those people with a process-oriented view of science, these theories are simply theories that we cannot yet test by technical means.”

was changed to:

### “**Conclusion**

Economic science ought to be the science of practical wisdom, the research program of the research program of, by, and for intelligent life. It ought to be the premier *intelligent life science*.”

### Chapter 5, *Lower Barriers to Trade*, first paragraph

Changed “moral vision” to “vision of what we ought to do” in the second sentence.

Changed “promotes” to “tends to promote” in the second sentence.

### Chapter 5, *Lower Barriers to Trade*, second paragraph, footnote

Changed “materialist” to “simplistic” in the first sentence.

### Afterword, end

Added the paragraph:

“I see the current culture war as a religious war, a war over civil religion. I am for replacing civil religion, especially the gospels of nativist James G. Blaine and socialist John Dewey, with the research program of, by, and for intelligent life.”

### Appendix B, Human Needs, first paragraph

Changed “ultimate normative” to “normative” in the first sentence.

### Appendix B, Balanced Excellence, first paragraph

Changed “mystical oneness with the infinite Being during life is needed” to “we need mystical oneness with the infinite Being during life” in the first sentence.

### Appendix B, Balanced Excellence, second paragraph

Changed “ultimate normative” to “normative” in the first sentence.

### Appendix B, Conclusion, first paragraph

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Changed “**ultimate** normative” to “normative” in the first sentence.

### Appendix C, first paragraph

Changed “**improves practical** wisdom” to “**makes people** wiser” in the first sentence.

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## Changes in Version 2006.03.24

### Acknowledgments, fourth paragraph

“**My frustration led to a vicious cycle of anger, anxiety, disgust, and depression.**”

and

“**Gordon knew that I had done the research and kindly gave me the lowest possible passing score.**”

were deleted.

### Acknowledgments, tenth paragraph

Changed “**, and into her three sons**” in the third sentence.

### Chapter 1, Modern Economics' Blind Spot, third paragraph

Changed “learning to” to “learning **how** to” in the last sentence.

### Chapter 1, Excellence in Living Wisely, last paragraph, first two sentences

“*Effectiveness in living wisely* **is** excellence in choosing temporal ends. *Efficiency in living wisely* **is** excellence in choosing means to temporal ends.”

were changed to:

“**We can define** *effectiveness in living wisely* to be excellence in choosing temporal ends **and** *efficiency in living wisely* **to be** excellence in choosing means to temporal ends.”

### Chapter 1, Excellence in Living Wisely, end

Added the paragraph:

“**The wise know how their tools work. These two managerial concepts allow us to plan our lives using timeless models and work our plans using temporal ones. In military**

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terms, these concepts allow us to plan our lives using strategic models and work our plans using tactical ones. In economic terms, they allow us to plan our lives using macroeconomic models<sup>6</sup> and work our plans using microeconomic ones. As we shall see, these two concepts help us to join many worldviews that are useful in living wisely.”

“<sup>6</sup> This is only true of timeless macroeconomic models. It is not true for macroeconomic models based on Carl Menger’s temporal definition of wealth.”

### Chapter 2, fourth footnote

“The research program of, by, and for intelligent life describes the world as it is in the process of becoming. From the positivist view of modern economics, it is positive in ends (describing the world as it is) and normative in means (prescribing the means of improving our descriptions of the world).”

was

deleted.

### Chapter 2, new fourth footnote, last sentence

“A strategy for learning (research program) can beat a theory.”

was changed to:

“The RTS research program beat the EOQ theory.”

### Chapter 2, Economic Science, last paragraph, last sentence

“We ought to use predictions to help us evaluate alternatives and explanations to help us formulate them.”

was changed to:

“Economic science ought to be the research program of the research program of, by, and for intelligent life. It ought to be the premier *intelligent life science*.<sup>10</sup>”

“<sup>10</sup> This reflexive / recursive research program describes the world as it is in the process of becoming. From the positivist view of modern economics, it is positive in ends (describing the world) and normative in means (prescribing how we ought to improve our descriptions of the world).”

### Chapter 2, *Refining Theories That We Use to Explain*, end

Returned the paragraph:

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“The theories that remain after we cull out all misleading and unethical theories deserve our tolerance. We base this tolerance on our ignorance of how best to live wisely rather than on the right to do as we please.”

### **Chapter 2, Conclusion**

“Economic science ought to be the science of practical wisdom, the research program of the research program of, by, and for intelligent life. It ought to be the premier *intelligent life science*.”

was deleted.

### **Chapter 3, Wealth, last paragraph**

“For more on the subject of wealth, see Appendix C.”

was moved to the end of the Consumption section and changed to:

“For more on the subjects of wealth and consumption, see Appendix C.”

### **Chapter 3, Two Means of Living Wisely, last paragraph**

Changed “for when our faculties are in jeopardy:” to “,” in the last sentence.

### **Chapter 4, Uneven Flow, title**

Changed title to “Smoothing Flow.”

### **Chapter 4, Smoothing Flow, last paragraph**

Changed “smoothing uneven flow” to “smoothing flow” in the last sentence.

### **Chapter 4, A Crude Look at the Whole, end**

Added the footnote:

“<sup>3</sup> This statement conflicts with the belief of Austrian economists, particularly Ludwig von Mises, that we do not need to test theories that explain human action. It also conflicts with the closely related belief of some scientists, notably physicist Stephen Wolfram, that we do not need to test computer models of emergent phenomena. See Lissack, M. R., & Richardson, K. A., “When Modeling Social Systems, Models ≠ The Modeled: Reacting to Wolfram’s A New Kind of Science,” *Emergence*, 2001, Vol. 3, No. 4, 95-111.”



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## Changes in Version 2006.03.30

### Entire treatise

Changed “cull out” to “weed out” and “culling out” to “weeding out” (10 occurrences).

### Acknowledgments, fourth footnote

Changed “simply could” to “could” in the second to last sentence.

Changed “later” to “late” in the last sentence.

### Chapter 1, Setting Words Aright, second footnote

Changed “prevail over” to “withstand” in the first sentence.

### Chapter 1, Excellence in Living Wisely, last paragraph, third sentence

“In economic terms, they allow us to plan our lives using macroeconomic models<sup>6</sup> and work our plans using microeconomic ones.”

“<sup>6</sup> This is only true of timeless macroeconomic models. It is not true for macroeconomic models based on Carl Menger’s temporal definition of wealth.”

was deleted.

### Chapter 1, Deciding Wisely, title

Changed title to “Strategic Assets.”

### Chapter 1, Strategic Assets, second paragraph

Changed “mercantilist concept of wealth” to “concept of wealth as precious metal coins and ingots” in the second sentence.

### Chapter 2, Science as a Process, last two paragraphs

Merged these two paragraphs.

Changed “consumers” to “customers” in the third sentence.

### Chapter 2, Economic Science, fourth paragraph

Changed “research program for” to “strategy for learning” in the last sentence.

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## Chapter 2, Economic Science, last paragraph

“For economic science as a whole, it is foolish to conflate these two methods. It is foolish to base the research program that defines economic science on a finite model. Doing so will tend to blind us to better problems to solve. Economic science ought to include both theories that we use to predict what happens in economies<sup>9</sup> and theories that we use to explain how to live wisely. Economic science ought to be the research program of the research program of, by, and for intelligent life. It ought to be the premier *intelligent life science*.<sup>10</sup>”

was changed to:

“In defining economic science, we ought not to conflate these two methods. We ought not to base the research program that defines economic science on a finite model, as this will tend to blind us to better problems to solve. At the same time, we ought to include both theories that we use to predict what happens in economies<sup>9</sup> and theories that we use to explain how to live wisely. We can meet both of these conditions by defining economic science to be the research program of the research program of, by, and for intelligent life. We can define economic science to be the premier *intelligent life science*.<sup>10</sup>”

## Chapter 2, Refining Theories That We Use to Explain, last paragraph, first sentence

Added the footnote:

“<sup>16</sup> This includes both members of the set of teleonomic theories and members of the set of theories that we use to explain how to live wisely based on the set of teleonomic theories.”

## Chapter 3, Introduction, first paragraph

“Wise managers use timeless concepts derived from the normative end of living wisely to become more effective. This chapter puts forward timeless macroeconomic alternatives to the modern economic concepts of wealth, consumption, trade, production, and profit.”

was changed to:

“The wise plan their lives using timeless models and work their plans using temporal ones. In military terms, the wise plan their lives using strategic models and work their plans using tactical ones. In economic terms, the wise plan their lives using macroeconomic models and work their plans using microeconomic ones. This chapter puts forward timeless alternatives to the modern economic concepts of wealth, consumption, trade, production, and profit.”

Changed title to “Two Types of Models.”

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## Chapter 3, Wealth, first paragraph

“Modern economists **and wise managers both** define wealth **as** goods and the resources to produce goods. **They differ in how they define goods. Modern economists define goods as those consumer goods and services** that we *want*. **Wise managers define goods as those things** that we *need* to live wisely.”

was changed to:

“Modern economists define wealth **to be** the **consumer** goods **and services** and the resources to produce **the consumer** goods **and services** that we *want*. **In contrast, the wise define wealth to be the resources** that we *need* to live wisely.”

## Chapter 3, Consumption, first paragraph

“**Unlike modern economists, wise managers consider practical wisdom.** From the **economic** view, winning a fortune in the lottery **will lead to a good life, and so it is unequivocally** good. From the **managerial** view, winning a fortune in the lottery can be bad if the winner is foolish, as would be the case if the winner were an **alcoholic** who would use the money to pursue his or her self-destructive habit. Understanding this difference **requires** a deeper understanding of pleasure and pain.”

was changed to:

“**The wise consider practical wisdom.** From the **temporal** view **of modern economics**, winning a fortune in the lottery is **always** good. From the **timeless** view **of those who seek to live wisely**, winning a fortune in the lottery can be bad if the winner is foolish, as would be the case if the winner were an **addict** who would use the money to pursue his or her self-destructive habit. Understanding this difference **calls for** a deeper understanding of pleasure and pain.”

## Chapter 3, *Trust*, last paragraph

Changed “**confidence men**” to “**swindlers**” in the third sentence.

## Chapter 3, *Three Common Misbeliefs*, last paragraph

Changed “**consumers**” to “**shoppers**” in all (2 occurrences).

Changed “**customers**” to “**shoppers**” in all (2 occurrences).

Changed “millions” to “**hundreds of millions**” in the second sentence.

Changed “**merchandise**” to “**items**” in the fifth sentence.

## Chapter 5, *Lower Barriers to Trade*, last two paragraphs

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“From a Marxist view, the predominant mode of production determines the culture. The logic of the industrial age holds that economies are like great machines in which people are interchangeable parts performing mindless tasks. **Industrial age** culture calls on people to seek pleasure.<sup>6</sup>

“The knowledge revolution has changed the logic of production. The new logic holds that economies are like great learning organisms in which people are the most important parts, the parts that learn. **Knowledge age** culture calls on people to seek to live wisely. Given this new logic, lowering trade barriers promotes the predominant mode of production, which in turn promotes progress toward the normative end of all humans living fully human lives.”

“<sup>6</sup> Supporting this simplistic view is the trend away from following traditions toward seeking pleasure. We see this trend clearly in England, where the cultural ideal changed from fulfilling one’s role in God’s plan to hedonist Jeremy Bentham’s “greatest good for the greatest number.””

was reduced to a footnote at the end of the first paragraph:

“<sup>6</sup> From a Marxist view, the predominant mode of production determines the culture. The logic of the industrial age holds that economies are like great machines in which people are interchangeable parts performing mindless tasks. **The** culture calls on people to seek pleasure. Supporting this simplistic view is the trend away from following traditions **and** toward seeking pleasure. We see this trend clearly in England, where the cultural ideal changed from fulfilling one’s role in God’s plan to hedonist Jeremy Bentham’s “greatest good for the greatest number.” The knowledge revolution has changed the logic of production. The new logic holds that economies are like great learning organisms in which people are the most important parts, the parts that learn. **The** culture calls on people to seek to live wisely. Given this new logic, lowering trade barriers promotes the predominant mode of production, which in turn promotes progress toward the normative end of all humans living fully human lives.”

### Appendix B, Introduction, first paragraph

Changed “**culling**” to “**weeding out**” in the first sentence.

### Appendix D, A Finer Timeless View, first paragraph

“Taiichi Ohno’s vision involved folding **parts of** the production system in on itself. The resulting operational complexity creates uneven flow. **Teams learn to manage this complexity by finding and solving small problems that cause uneven flow. The goal is not smooth flow for its own sake. The goal is to produce ever more wisely.**”

was changed to:

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“Taiichi Ohno’s vision involved folding the production system in on itself. The resulting operational complexity creates uneven flow of work-in-process (WIP). Production teams find and solve problems that cause uneven flow. Solving these problems improves procedures, machine design, trading relations, and product design.”

### **Appendix D, *Operational Complexity***

Merged this section into the *Folding in Operations* section. Changed title to “*Folding in Processes*.”

Changed second paragraph from:

“We can measure the complexity of production operations by counting the number of decisions that the production team faces. The simplest system is a “pull system” with no flexible links. A “pull system” is one in which customers “pull” product through the system. There is no production until there is a call for production from the customer. The customer, not the production team, sets the rate of production. This simple system has only one decision, which is whether it is available to produce or not.”

to:

“Operational complexity concerns the number of decisions production teams face. The fewer the number of flexible links, the simpler the operation is.”

### **Appendix D, *Folding In Operations*, new third paragraph**

Changed ““pull system”” to “production line” in the second sentence.

### **Appendix D, *Folding In Operations*, new fourth paragraph**

Changed “parts of the production line” to “processes” in the last sentence.

### **Appendix D, *Folding In Operations*, new fifth paragraph**

Changed “parts of the production line” to “processes” in the first sentence.

### **Appendix D, *Folding In Operations*, last paragraph**

Changed “production engineers” to “engineers” in the first sentence.

Deleted the last sentence:

“When they expect rates to be moderate, they plan to produce in batches on folded in lines.”

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## Appendix D, *Batch Size*, title

“**Batch Production**”

was deleted.

## Appendix D, *Smoothing Flows*, second paragraph

Changed “**teams**” to “**engineers**” in the last sentence.

Added the sentence:

“**They do so by adding or removing WIP from these links.**”

## Appendix D, *Smoothing Flows*, last three paragraphs

“**As described in the first appendix, the Toyota system swallows and digests problems too complex for production engineers to solve by themselves. Swallowing a complex problem is a metaphor for engineers implementing their crude solution to a complex problem. Engineers know that ignorance of how to deal with this complexity leads to the uneven flow of WIP. Engineers estimate how much uneven flow their crude solution will create. They then reduce expected uneven flow to manageable levels by stretching flexible links. The extra WIP inventory in stretched links buffers the uneven flow of WIP.**

“**Digesting complex problems is a metaphor for finding and solving small problems that create uneven flow. Solving these problems smoothes the uneven flow. It also improves procedures, machine design, trading relations, and product design.**

“**Putting these two processes together, engineers implement their crude solution to a complex problem. This crude solution creates uneven flow. The team solves small problems that create uneven flow. Solving these small problems embeds useful knowledge into the line. Once things are running smoothly, the team tightens one or more flexible links. This uncovers problems that create uneven flow. The team solves these problems. Once things are again running smoothly, the team tightens more links, which uncovers more problems to solve. This recursive process continues until the team can find no more problems to solve.**”

were changed to:

“**Satisfying customers ever more wisely creates complex production problems. Production engineers devise and put into place crude solutions to these problems based on their ideas of how best to fold in lines. These crude solutions create uneven flow. Engineers buffer most of this uneven flow by adding WIP inventory to flexible links. In effect, they convert complex production problems into excess WIP problems.**

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“If the engineers have added too much WIP, there will be no workflow problems to solve. Without a problem to solve there can be no improvement. Engineers fix this by removing WIP from flexible links.

“If the engineers have added too little WIP, the resulting flood of workflow problems overwhelms the team. Engineers fix this by adding WIP to flexible links.

“If the engineers have added the right amount of WIP, there will be just enough problems for the team to solve while they produce. Solving these problems smoothes the uneven flow and embeds useful knowledge into procedures, machine design, trading relations, and product design.

“Once things are running smoothly, engineers remove WIP from one or more flexible links. This uncovers problems that create uneven flow. The team solves these problems.

“Engineers continue the process of removing WIP from flexible links until the team can find no more problems that it is able to solve.”

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### Changes in Version 2006.03.31

#### Chapter 1, Excellence in Living Wisely, last paragraph

“The wise know how their tools work. These two managerial concepts allow us to plan our lives using timeless models and work our plans using temporal ones. In military terms, these concepts allow us to plan our lives using strategic models and work our plans using tactical ones. As we shall see, these two concepts help us to join many worldviews that are useful in living wisely.”

was changed to:

“The wise know how their tools work. These two managerial concepts help us to plan our lives using timeless models and work our plans using temporal ones. In military terms, these two concepts help us to plan our lives using strategic models and work our plans using tactical ones. As we shall see, these concepts help us to join ideal models to practical ones.”

#### Chapter 2, Science as a Process, last paragraph

“Most producers of tested intellectual tools base their concept of quality on technical excellence. In contrast, most other producers base their concept of quality on both technical excellence and usefulness. They recognize that a technically perfect brass watermelon is still a brass watermelon, something that customers neither need nor want. The solution to this tunnel vision problem is to define science to be the ever-

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evolving process of refining everyday thinking.<sup>4</sup> This definition provides us with a vision of how best to improve the process of refining everyday thinking. It also reminds us that the products of science are useful assays of the truth rather than the truth itself.<sup>5</sup>”

was changed to:

“Most producers base their concept of quality on both technical excellence and usefulness. They recognize that a technically perfect brass watermelon is still a brass watermelon, something that customers neither need nor want. In contrast, most producers of tested intellectual tools base their concept of quality solely on technical excellence. We can broaden the narrow vision of these producers by defining science to be the process of refining everyday thinking.<sup>4</sup> This definition provides us with a vision of how best to improve the process of refining everyday thinking. It also reminds us that the products of science are useful assays of the truth rather than the whole truth.<sup>5</sup>”

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### Changes in Version 2006.04.03

#### Chapter 1, Mainstream Economics' Blind Spot, fifth paragraph

Changed “RTS has” to “the results of RTS have” in the last sentence.

#### Chapter 1, Mainstream Economics' Blind Spot, last paragraph

“For more on the subject of a learning worldview, see Appendix A.”

was reduced to a footnote at the end of the sixth paragraph and changed to:

“<sup>4</sup> For more on the subject of a learning worldview, see Appendix A.”

#### Chapter 1, Excellence in Living Wisely, last paragraph, last sentence

“In military terms, these two concepts help us to plan our lives using strategic models and work our plans using tactical ones. As we shall see, these concepts help us to join ideal models to practical ones.”

was changed to:

“Timeless models help us to find problems to solve. They also help us to find mistakes.”

#### Chapter 1, Strategic Assets, title

Changed title back to “A Strategy for Learning.”



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### **Chapter 2, *Refining Theories That We Use to Explain*, eighth paragraph**

“For more on the subject of reverence for life, see Appendix B.”

was reduced to a footnote at the end of the sixth paragraph and changed to:

“<sup>16</sup> For more on the subject of reverence for life, see Appendix B.”

### **Chapter 2, *Refining Theories That We Use to Explain*, seventh paragraph**

Changed “helping others live” to “helping others **to** live” in the first sentence.

Changed “**In short, we**” to “**We**” in the last sentence.

### **Chapter 2, *Refining Theories That We Use to Explain*, last paragraph**

Changed “**all**<sup>17</sup> misleading and unethical” to “misleading and unethical<sup>17</sup>” in the first sentence.

### **Chapter 4, *Smoothing Flow*, last paragraph**

“For more on the subject of smoothing flow, see Appendix D.”

was reduced to a footnote at the end of the fourth paragraph and changed to:

“<sup>2</sup> For more on the subject of smoothing flow, see Appendix D.”

### **Chapter 6, first paragraph**

Changed “**as**” to “**to be**” in the third sentence.

Changed “live” to “**to** live” in the fifth sentence.

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## **Changes in Version 2006.04.04**

### **Acknowledgments, fourth paragraph**

Changed “problem” to “**boundless** problem” in the fifth sentence.

Changed “**what I now know to be an infinitely large** problem” to “**this** problem” in the sixth sentence.

### **Chapter 2, *Science as a Process*, last paragraph, footnote, first three sentences**

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“We base theories on assumptions. Not all of these assumptions are testable. To confuse a scientific theory with the truth is to make the philosophical mistake of confirming the consequent.”

was changed to:

“To confuse a scientific theory with the whole truth is to make the philosophical mistake of confirming the consequent.”

### **Chapter 2, Economic Science, last paragraph, last sentence, footnote**

Changed “describes” to “seeks to describe” in the first sentence.

### **Chapter 3, Profit, footnote**

Changed “definition” to “decision science based definition” in the first sentence.

### **Chapter 6, first paragraph, first four sentences**

“We live well by satisfying our needs for those things that we need to live well. We live wisely by continually improving the process of satisfying our needs for those things that we need to live well. Living wisely calls for defining science to be the process of refining everyday thinking. The resulting research program embraces theories that help us to predict what happens in economies and rejects theories that aim at providing us with consumer goods and services.”

was changed to:

“We ought to define science to be the process of refining everyday thinking. The resulting research program of, by, and for intelligent life embraces theories that help us to predict what happens in economies and rejects theories that aim at providing us with consumer goods and services.”

### **Afterword, third paragraph**

Changed “postponing change” to “retarding the replacement of knowledge for non-knowledge resources” in the last sentence.

### **Appendix B, Heroism, first paragraph**

Changed “heroism” to “the heroic act” in the first sentence.

### **Appendix B, Heroism, last paragraph**

Changed “their societies” to “others” in the fifth sentence.

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## Appendix B, *Goodness and Rightness*, first paragraph

Changed “to **choose what to do in life and death situations**” to “to **make major decisions**” in the fifth sentence.

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## Changes in Version 2006.04.12

### Chapter 2, *Science as a Process*, second paragraph

Deleted “, **including intellectual tools**” in the last sentence.

### Chapter 2, *Science as a Process*, last paragraph

Changed “**producers of tested intellectual tools**” to “**specialists in science**” in the third sentence.

### Chapter 2, *Refining Theories That We Use to Explain*, fifth paragraph, second and third sentences

“We ought to weed out those that consider only our bodies, or our minds, or our spirits. **Fools consider only their bodies, or their minds, or their spirits.**<sup>14</sup>”

were changed to:

“We ought to weed out those that consider only our bodies, or our minds, or our spirits.<sup>14</sup>”

### Chapter 2, *Refining Theories That We Use to Explain*, sixth paragraph

Changed “**We**” to “**In short, we**” in the last sentence.

### Chapter 2, *Refining Theories That We Use to Explain*, last paragraph, first sentence

“The theories that remain **after we weed out misleading and unethical theories**<sup>17</sup> deserve our tolerance.”

“<sup>17</sup> **This includes both members of the set of teleonomic theories and members of the set of theories that we use to explain how to live wisely based on the set of teleonomic theories.**”

was changed to:

“**Over time, we will learn ever more ways of weeding out theories. In our time, the theories that remain deserve our tolerance.**”

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## Chapter 3, Two Types of Models, first paragraph

“In military terms, the wise plan their lives using strategic models and work their plans using tactical ones. In economic terms, the wise plan their lives using macroeconomic models and work their plans using microeconomic ones.”

were deleted.

## Chapter 5, Choosing Our Leaders, first paragraph

Changed “natures” to “nature” in the last sentence.

## Afterword, last paragraph, end

Added the sentences:

“We ought to consecrate the search for knowledge of how to live wisely, not our tribe. We ought to be on the side of wisdom. We ought to be on the side of our better angels.”

## Appendix A, Ohno’s Vision, first paragraph

“In the early postwar years, Japan’s small market for trucks and Toyota’s lack of capital forced Toyota to produce trucks in small batches. Taiichi Ohno knew that Toyota could never catch up to the giant American firms by using their means of making cars and trucks. Instead, he imagined a means of capturing the scale economies of mass production in Toyota’s small factories. Scale economies would come from producing batches of similar goods rather than large numbers of identical goods. Batches of similar parts would flow like the continuous production of identical parts.”

was changed to:

“In the early postwar years, Japan’s small market for trucks and lack of capital forced Toyota to produce trucks in small batches. Taiichi Ohno knew that Toyota could never catch up to Western firms by using Western means of making trucks. Instead, he imagined factories making large numbers of similar parts rather than large numbers of identical parts. Batches of similar parts would flow like the continuous production of identical parts.”

## Appendix A, Ohno’s Vision, second paragraph

Changed “strategy for learning” to “strategy for learning how to invent this knowledge” in the last sentence.

## Appendix A, Ohno’s Vision, last three paragraphs

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“The Toyota system is a batch production system. Like other batch systems, it combines characteristics of custom and continuous process production. It uses tools to build a variety of parts like a job shop, but its river-like plant layout is similar to that of continuous processes.

“Unlike other batch systems, the Toyota system combines a simple, elastic, and robust means of linking processes (*dual kanban*) with continual improvement (*kaizen*). The elasticity of these links allows the system to stretch to fit problems that are too complex for production engineers to solve by themselves. Tightening stretched links uncovers small production problems that team members are able to solve. Solving these simple problems solves the complex problem. In short, the Toyota system swallows and digests complex problems.

“Toyota first used this strategy for learning to realize Ohno’s goal of catching up to American firms. The company has since used it to learn to (1) build higher quality products at lower costs, (2) build a variety of products without increasing costs, and (3) introduce new products quickly.”

was changed to:

“This strategy for learning combines a simple, elastic, and robust means of linking processes (*dual kanban*) with continual improvement (*kaizen*). The elasticity of these links allows the production system to stretch to fit problems that are too complex for engineers to solve by themselves. Tightening stretched links uncovers small problems that team members are able to solve. Solving these small problems solves the complex problem. In short, the system swallows and digests complex problems.

“Toyota first used this strategy for learning to capture scale economies without scale. The company has since used it to learn to produce higher quality products, a wider variety of products, and new products ever more wisely.”

### Appendix B, Schweitzer’s Universal Spiritual Need, sixth paragraph

“Justice based on Schweitzer’s reverence for life is the ideal balance of social justice, international justice, intergenerational justice, and interspecies justice. Social justice considers the needs of members of a national society. International justice considers the needs of national societies. Intergenerational justice considers the needs of generations. Interspecies justice considers the needs of species. Justice based on reverence for life considers all these needs. All other forms of justice fall short of justice based on reverence for life.”

was deleted.

### Appendix D, A Finer Timeless View, first paragraph

Changed “involved” to “involves” in the first sentence.

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## Appendix D, *Inducing Knowledge*, third paragraph

Changed “We” to “Teams” in the first sentence.

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## Changes in Version 2006.04.15

### Preface, last paragraph

“Strategies for learning to live wisely focus our attention on what we ought to learn. At the dawn of the industrial age, Adam Smith’s example of a pin factory showed the wisdom of pursuing the virtuous circle of the division of labor and the expansion of market size. Today, Toyota’s strategy for learning how to produce ever more wisely shows the wisdom of pursuing the virtuous circle of good people and good products: Good people produce good products. Good products, *including good intellectual tools*, produce good people. Given this virtuous circle, we ought to learn more about good people and good products.”

was moved to the end of the Afterword and changed to:

“At the dawn of the industrial age, Adam Smith’s example of a pin factory showed the wisdom of the virtuous circle of the division of labor and the expansion of market size. Today, Toyota’s strategy for learning how to produce ever more wisely shows the wisdom of the virtuous circle of good people and good products. Good people produce good products. Good products, *including good intellectual tools*, produce good people. Given this wisdom, we ought to learn more about good people and good products.”

### Chapter 1, Excellence in Living Wisely, last paragraph

“The wise know how their tools work. These two managerial concepts help us to plan our lives using timeless models and work our plans using temporal ones. Timeless models help us to find problems to solve. They also help us to find mistakes.”

was appended to the preceding paragraph and changed to:

“They help us to plan our lives using timeless models and work our plans using temporal ones. Timeless models help us to find problems to solve. They also help us to find mistakes.”

### Chapter 2, Science as a Process, last paragraph

Changed “science” to “this process” in the last sentence.

### Chapter 2, Science as a Process, last paragraph

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Changed “**science**” to “**this process**” in the last sentence.

## Chapter 2, Economic Science, third paragraph

Changed “which is **in part** due” to “which, **in part**, is due” in the third sentence.

## Chapter 2, *Refining Theories We Use to Explain*, sixth paragraph

Changed “**members of this set**” to “**theories**” in the first sentence.

## Chapter 2, *Refining Theories We Use to Explain*, seventh paragraph

Changed “unethical **teleonomic** theories” to “unethical theories” in the first sentence.

## Chapter 2, *Refining Theories We Use to Explain*, eighth paragraph

Appended to seventh paragraph.

## Chapter 2, *Refining Theories We Use to Explain*, last paragraph, first sentence

“Over time, we will **learn** ever more ways of weeding out theories.”

was changed to:

“Over time, we will **agree on** ever more ways of weeding out **both theories that we use to define our needs and theories that we use to explain how to satisfy them.**”

## Chapter 3, Practical Wisdom, first paragraph

Changed “**ultimate** end of life is **happiness**, a life **well lived**” to “**normative** end of life is **living a good** life” in the first sentence.

## Chapter 6, last paragraph

Changed “**We**” to “**To do so, we**” in the first sentence.

## Appendix A, Ohno's Vision, last paragraph

Changed “**The company**” to “**It**” in the last sentence.

## Appendix B, Introduction, title

Changed “**Introduction**” to “**Timeless Logic.**”

## Appendix B, Timeless Logic, first paragraph

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Changed “**such assumption**” to “**of these**” in the second sentence.

Changed “**ultimate**” to “**normative**” in the last sentence.

### **Appendix B, Timeless Logic, last paragraph**

Changed “**ultimate**” to “**normative**” in the last sentence.

### **Appendix B, Conclusion, title**

Changed “**Conclusion**” to “**Synthesis.**”

### **Appendix D, *Smoothing Flows*, third paragraph, last sentence**

“**In effect, they convert complex production problems into excess WIP problems.**”

was deleted.

### **Appendix D, *Smoothing Flows*, fourth through sixth paragraphs**

Changed “**have added**” to “**add**” in the first sentence of each paragraph.

Merged these three paragraphs together.

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## **Changes in Version 2006.04.18**

### **Chapter 2, Refining Everyday Thinking, second paragraph**

Changed “**rejecting**” to “**weeding out**” in the fifth sentence.

Changed “**rejecting**” to “**weeding out**” in the seventh sentence.

### **Chapter 2, Refining Everyday Thinking, fourth paragraph, third sentence**

Added the footnote:

“**Strictly speaking, we do not “weed out” theories. We define the useful domain of theories by “weeding out” applications of theories that are not useful. Corn in a cornfield is a crop. Corn in a soybean field is a weed.**”

### **Chapter 2, *Refining Theories That We Use to Explain*, second paragraph, last two sentences**



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“Following this example, specialists can help to create an environment in which all of us test theories that we use to explain how best to live wisely. Specialists can then help us to improve the process of testing these theories by helping us to improve our research skills and methods.”

were deleted. The third paragraph was then appended to the second..

### Afterword, second paragraph, first sentence

“I am neither “liberal” nor “conservative” in the way that people in the United States use these terms.”

was deleted.

### Afterword, third and fourth paragraphs

“I believe that those on the left ought to know that **revering life** creates turbulence. A nanny state that seeks to protect its people by retarding **the replacement of knowledge for non-knowledge resources** is unfair to its people, other societies, future generations, and other species.

“I also believe that those on the right ought to know that we cannot separate our right to choose from our responsibility to choose ever more wisely. Right wing elites once claimed that the United States owed its success to their **Anglo-Saxon Protestant** heritage. **Their children claimed it was their Protestant heritage. Their grandchildren claimed it was their Christian heritage. Their great-grandchildren claim it was their Judeo-Christian heritage. Their great-great-grandchildren will likely claim it was their Abrahamic heritage.** A wiser explanation is that the United States owes its success **not to any fixed cultural tradition but rather** to its tradition of freedom and progress **toward the normative end of revering life.**”

were changed to:

“I believe that those on the left ought to know that **progress** creates turbulence. A nanny state that seeks to protect its people by retarding **progress** is unfair to its people, other societies, future generations, and other species.

“I also believe that those on the right ought to know that we cannot separate our right to choose from our responsibility to choose ever more wisely. Right wing elites once claimed that the United States owed its success to their **Puritan** heritage. **Current right wing elites** claim it was their Judeo-Christian heritage. **Future elites** will likely claim it was their Abrahamic heritage. A wiser explanation is that the United States owes its success to its tradition of freedom and progress.”

### Afterword, last paragraph, last two sentences

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“We ought to be on the side of **wisdom**. We ought to be on the side of our better angels.”

were changed to:

“We ought to be on the side of **the** better angels **of our nature**.”

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### Changes in Version 2006.04.22

#### Chapter 1, Excellence in Living Wisely, last paragraph

Added “**(idealistic / cosmic)**” and “**(pragmatic / worldly)**” to the third sentence.

#### Chapter 4, Living Ever More Wisely, first paragraph, second sentence

Changed “**Living ever more wisely**” to “**Progress**.”

Added the footnote:

“<sup>2</sup> **Inherent in this recursionist concept of progress is the belief that intelligent beings ought to be stewards for the whole of life. Modern economists recognize the roles that psychic income and transaction costs play in stewardship. They have been slow to recognize the potential benefits of inducing knowledge by removing resources. See Appendix D.**”

#### Chapter 5, Justice, last paragraph, seventh sentence

“Ideally, **the** private charities, **guided by the superior wisdom of their contributors**, would drive the government out of the business of providing welfare.”

was changed to:

“Ideally, private charities would drive the government out of the **welfare** business.”

#### Appendix B, *Schweitzer’s Universal Spiritual Need*, fourth and fifth paragraphs

“Pure magical mysticism requires that we abandon life rather than live it. It only becomes practicable when mixed with ethical mysticism. Because it ignores our relation with the world, it offers no foundation for an ethical system. **We see this manifest in ancient Hinduism’s failure to explain adequately how merit (karma), which concerns our relation with the infinite Being, relates to worldly duty (dharma), which concerns our relation with life. The result was a system that fixed people’s roles in society at birth. This means of allocating labor is a tremendous hindrance to living wisely.**

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“Ethical mysticism does not involve this problem. However, unlike the magical, it can be incomplete. Where complete ethical mysticism stems from a union with all life, incomplete forms stem from a union with something less. **Incomplete forms include the mysticism of such modern Western movements as nationalism, socialism, fascism, and communism.** Only the complete form can compete successfully with magical mysticism in satisfying the need for mystical oneness. In Schweitzer’s words:”

were changed to:

“Pure magical mysticism requires that we abandon life rather than live it. It only becomes practicable when mixed with ethical mysticism. Because it ignores our relation with the world, it offers no foundation for an ethical system.<sup>4</sup> Ethical mysticism does not involve this problem. However, unlike the magical, it can be incomplete. Where complete ethical mysticism stems from a union with all life, incomplete forms stem from a union with something less.<sup>5</sup> Only the complete form can compete successfully with magical mysticism in satisfying the need for mystical oneness. In Schweitzer’s words:”

“<sup>4</sup> **We see this in ancient Hinduism’s failure to explain adequately how merit (karma), which concerns our relation with the infinite Being, relates to worldly duty (dharma), which concerns our relation with life. The resulting caste system has been a tremendous hindrance to progress toward the normative end of living wisely.**”

“<sup>5</sup> **Incomplete forms of ethical mysticism include those of such modern Western movements as nationalism, socialism, fascism, and communism.**”

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### Changes in Version 2006.04.25

#### Chapter 2, Refining Everyday Thinking, third paragraph, third footnote, last sentence

“**This excludes substantial changes to the decision-making group.**”

was deleted.

#### Chapter 2, Science as a Process, last paragraph, fifth footnote

Changed “**possibility of learning**” to “**best problems to solve**” in the first sentence.

#### Chapter 2, Economic Science, last paragraph

“In defining economic science, we ought not to conflate these two methods. We ought not to base the research program that defines economic science on a finite model, as this will tend to blind us to better problems to solve. At the same time, we ought to

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include both theories that we use to predict what happens in economies<sup>10</sup> and theories that we use to explain how to live wisely. We can meet both of these conditions by defining economic science to be the research program of the research program of, by, and for intelligent life. We can define economic science to be the premier *intelligent life science*.<sup>11</sup>”

“<sup>10</sup> We ought to test theories that we use to predict what happens in economies by how well they help us to predict what happens in economies. This is compatible with the instrumental interpretation of Milton Friedman’s definition of positive economic science as “a body of tentatively accepted generalizations about economic phenomena that can be used to predict the consequences of changes in circumstances.” Friedman, Milton, “The Methodology of Positive Economics,” *Essays in Positive Economics*, (Chicago: University of Chicago Press, 1953), 39.”

“<sup>11</sup> This reflexive / recursive research program seeks to describe the world as it is in the process of becoming. From the positivist view of modern economics, it is positive in ends (describing the world) and normative in means (prescribing how we ought to improve our descriptions of the world).”

was changed to:

“In defining economic science, we ought not to conflate these two methods. We ought not to base the research program that defines economic science on a finite model, as this will tend to blind us to better problems to solve. At the same time, we ought to include both theories that we use to predict what happens in economies and theories that we use to explain how to live wisely. We can meet both of these conditions by defining economic science to be the research program of the research program of, by, and for intelligent life. We can define economic science to be the premier *intelligent life science*.<sup>10</sup>”

“**Refining Theories That We Use to Predict**

We ought to refine the set of theories that we use to predict what happens in economies by testing how well they help us to predict what will happen in economies.<sup>11</sup> It is wise for us to assign this task to people who have the knowledge to do this task well.”

“<sup>10</sup> This reflexive / recursive research program seeks to describe the world as it is in the process of becoming. From the positivist view of modern economics, it is positive in ends (describing the world) and normative in means (prescribing how we ought to improve our descriptions of the world).”

“<sup>11</sup> This is compatible with the instrumental interpretation of Milton Friedman’s definition of positive economic science as “a body of tentatively accepted generalizations about economic phenomena that can be used to predict the consequences of changes in circumstances.” Friedman, Milton, “The Methodology of

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Positive Economics,” *Essays in Positive Economics*, (Chicago: University of Chicago Press, 1953), 39.”

### Chapter 2, *Refining Theories That We Use to Explain*, first paragraph

“Logical and elegant theories that we use to explain how best to live wisely stand ready to be proven less useful than similar theories in helping us to find problems to solve. Regrettably, we cannot test these theories in the same way that we test the theories that we use to predict what happens in economies. This is because we do not know, and will never know with certainty, what it is to live wisely.”

was changed to:

“We ought to refine the set of theories that we use to explain what happens in economies by testing how well they help us to find problems to solve in our quest to live wisely. It is foolish for us to assign this task to experts. This is because no one can explain to us how to live wisely, how to follow our ideal path toward living a good life. We must learn to do this for ourselves.”

### Chapter 2, *Refining Theories That We Use to Explain*, second paragraph

“Toyota provides us with a very different model for testing these theories. At Toyota, experts help to create an environment in which team members solve problems that are too complex for experts to solve by themselves. Experts then help team members to improve the process of solving problems by helping team members to improve their problem solving skills and methods. This means of testing these theories requires more than free markets. It requires a vision for what we ought to do.”

was deleted.

### Chapter 2, *Refining Theories That We Use to Explain*, new second paragraph

Changed “live wisely,” to “**learn to live wisely**” in the first sentence.

Changed “**possibility to live more wisely**” to “**best problems to solve**” in the last sentence of the twelfth footnote.

### Chapter 2, *Refining Theories That We Use to Explain*, new third paragraph

“We ought to weed out members of **this** set that fail to help us identify what we need to live wisely. **We** ought to weed out those that consider only our bodies, or our minds, or our spirits.”

was changed to:

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“We ought to weed out members of the set of theories we use to explain what we need to live wisely that fail to help us find what we need to live wisely. For example, we ought to weed out those that consider only our bodies, or our minds, or our spirits.”

### Chapter 2, *Refining Theories That We Use to Explain*, last paragraph

Changed “define” to “explain” and “them” to “our needs” in the first sentence.

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## Changes in Version 2006.04.28

### Chapter 1, *Modern Economics' Blind Spot*, last paragraph

Switched “invest in learning-by-doing” in the second sentence and “improve the environment for learning how to set up tools more quickly” in the last sentence.

### Chapter 2, *Economic Science*, third paragraph, end

Added the sentence:

“The harmony of these two tendencies is a siren song.”

### Chapter 2, *Economic Science*, last two paragraphs

“Living wisely is a process. Like the problem of how best to improve the process of building cars, the problem of how best to improve the process of living wisely is an open-ended one. As we saw in the EOQ/RTS example, there are two basic methods of “solving” an open-ended problem. The first (EOQ) method is to reduce the open-ended problem to a finite model. The second (RTS) method is to devise a strategy for learning how to improve the process of solving the open-ended problem.”

“In defining economic science, we ought not to conflate these two methods. We ought not to base the research program that defines economic science on a finite model, as this will tend to blind us to better problems to solve. At the same time, we ought to include both theories that we use to predict what happens in economies and theories that we use to explain how to live wisely. We can meet both of these conditions by defining economic science to be the research program of the research program of, by, and for intelligent life. We can define economic science to be the premier *intelligent life science*.<sup>107</sup>”

“Mathematicians face a similar (open-ended) problem when they seek to evaluate the transcendental number pi. Rather than seeking ever better rational approximations of pi: 3, 22/7, 355/113, ..., they seek ever better recursive processes for calculating pi:  $\pi = 4(1 - 1/3 + 1/5 - 1/7 + 1/9 - 1/11 + \dots)$ ;  $\pi = 2 \cdot \sqrt{3}(1 - 1/3 \cdot 3 + 1/5 \cdot 3^2 - 1/7 \cdot 3^3 + \dots)$ ”

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$1/9 \cdot 3^4 - 1/11 \cdot 3^5 + \dots$ ); ..., where better recursive processes are those that converge more quickly.”

“<sup>10</sup> This reflexive / recursive research program seeks to describe the world as it is in the process of becoming. From the positivist view of modern economics, it is positive in ends (describing the world) and normative in means (prescribing how we ought to improve our descriptions of the world).”

were moved to the end of the chapter under the heading *Defining Economic Science* and changed to:

“We ought to define economic science **in a way that includes** both the theories that we use to predict and **those** that we use to explain. We can **do so** by defining economic science to be the research program of the research program of, by, and for intelligent life. We can define economic science to be the premier *intelligent life science*.<sup>167</sup>”

“<sup>16</sup> This reflexive / recursive research program seeks to describe the world as it is in the process of becoming. From the positivist view of modern economics, it is positive in ends (describing the world) and normative in means (prescribing how we ought to improve our descriptions of the world).”

### Chapter 2, Economic Science, end

Added the paragraph:

“If we all acted wisely all of the time, we would not need to distinguish between the theories that we use to predict and those that we use to explain. Given that we do not act wisely all of the time, we ought to distinguish between them.”

### Chapter 2, Refining Theories That We Use to Predict, ninth footnote

Changed “positive” to “(positive)” in the first sentence.

### Chapter 2, Refining Theories That We Use to Explain, second paragraph

Changed “specialists” to “experts” in all (3 occurrences).

### Chapter 2, Refining Theories That We Use to Explain, third paragraph

Changed “our theories for living wisely” to “the theories that we use to explain how to satisfy our needs” in the fourth sentence.

Changed “our loose theories for living wisely” to “these loose theories” in the last sentence.

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Changed “this set of theories” to “the set of theories that we use to explain what we need to live wisely” in the last sentence.

### Chapter 2, Defining Economic Science, first paragraph

Changed “the open-ended problem to a finite model” to “it to a solvable model” in the new third sentence.

Changed “devise a strategy for learning how to improve the process of solving the open-ended problem” to “improve the process of solving it” in the last sentence.

### Chapter 2, Defining Economic Science, second paragraph

Changed “finite” to “solvable” in the second and third sentences.

Changed “meet both of these conditions” to “do both” in the fourth sentence.

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## Changes in Version 2006.05.06

### Preface, last paragraph

Changed “refining theories” to “weeding out members of the set of theories that we use to explain how to live wisely” in the first sentence.

### Preface, end

Added the paragraph:

“This research program yields a “God’s eye” view of life. Its timeless concepts help us to find the problems that we ought to solve and the things that we will need to solve them.”

### Chapter 2, Refining Everyday Thinking, fourth footnote

Changed “theories” to “scientific theories” in the first sentence.

Changed “define the useful domain of theories by “weeding out” applications of theories that are not useful” to ““weed out” applications of these theories” in the second sentence.

### Chapter 2, Science as a Process, second paragraph

Changed “specialized” to “expert” in the first sentence.



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## Chapter 2, Science as a Process, last paragraph

Changed “specialists” to “experts” in the third sentence.

Changed “broaden the narrow vision of these producers” to “correct this” in the fourth sentence.

## Chapter 2, Economic Science, last paragraph

Changed “we do not” to “we all do not” in the last sentence.

## Chapter 2, Refining Theories That We Use to Explain, first paragraph

Changed “must” to “ought to” in the last sentence.

Added the following footnote at the end of the last sentence:

“<sup>10</sup> This clearly applies to refining the (microeconomic) theories that we as individuals seeking to live wisely use to explain what happens in economies. It also applies to refining the (macroeconomic) theories that we as individuals seeking to govern ourselves wisely use to explain what happens in economies. We ought to seek to change or abandon governments that hinder us from learning to live ever more wisely.”

## Chapter 4, A Crude Look at the Whole, last paragraph

Changed “Specialists” to “Experts” in the first sentence.

## Chapter 5, Justice, last paragraph, last four sentences

“They would also include unlimited giving to private charities. The government would tax all other withdrawals as income. Ideally, private charities would drive the government out of the welfare business. The government safety net program, like a militia, would remain available for emergencies.”

was changed to:

“They would also include unlimited giving to private charities.<sup>7</sup> The government would tax all other withdrawals as income. *The haves as well as the have-nots ought to learn to live ever more wisely.*”

<sup>7</sup> Ideally, private charities would drive the government out of the welfare business. The government safety net program, like a militia, would remain available for emergencies.”

## Afterword, last paragraph, last sentence

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Changed “the better angels of our nature” back to “our better angels” in the last sentence.

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## Changes in Version 2006.06.01

### Preface, last paragraph

Changed “things” to “resources” in the last sentence.

### Chapter 1, A Strategy for Learning, second paragraph

Changed “ingots” to “bullion” in the second sentence.

### Chapter 2, Refining Everyday Thinking, second paragraph, last three sentences

“A good example of knowledge that falls into this set and into no other set is that of an eyewitness who can identify but not describe a suspect’s face. We refine worldly knowledge (U) by weeding out all worldly knowledge that we cannot express in words or symbols. What remains are worldly narratives (A). We refine worldly narratives (A) by weeding out those that fail to meet standards for logic and elegance. What remains are logical and elegant theories (B).”

were changed to:

“We refine worldly knowledge by weeding out all worldly knowledge that we cannot express in words or symbols. What remains are stories about the world. We refine these stories by weeding out those that are not clear, concise, and logical. What remains is the set of precise stories about the world (S).”

### Chapter 2, Refining Everyday Thinking, Venn diagrams

The first diagram was deleted and the second was changed to reflect the new text.

### Chapter 2, Refining Everyday Thinking, third paragraph

Changed “theories” to “stories about the world” in the first sentence.

### Chapter 2, Refining Everyday Thinking, second footnote

Changed “theories” to “stories” in the first and fourth sentences.

### Chapter 2, Refining Everyday Thinking, fourth paragraph

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“We live in a complex world. If we are to live wisely, we need to test theories by how well they perform their roles in decision-making. We need to refine narratives (A) by weeding out those that fail to meet our empirical standards for predicting.<sup>4</sup> What remains are tested theories that we use to predict (C<sub>1</sub>). We also need to refine logical and elegant theories (B) by weeding out those that fail to meet our empirical standards for helping us find problems to solve. What remains are tested theories that we use to explain (C<sub>2</sub>).”

was changed to:

“We refine our stories about the world by testing how well they perform their roles in decision-making. We refine the set of precise stories about the world (S<sub>1</sub>) by weeding out members that fail to meet our empirical standards for predicting.<sup>4</sup> What remains is the set of refined stories that we use to predict (S<sub>2</sub>). We also refine the set of precise stories about the world (S<sub>1</sub>) by weeding out members that fail to meet our empirical standards for helping us find problems to solve. What remains is the set of refined stories that we use to explain (S<sub>3</sub>).”

### Chapter 2, Refining Everyday Thinking, fourth footnote

Changed “scientific theories” to “these stories” in the first sentence.

Changed “theories” to “stories” in the fourth sentence.

### Chapter 2, Refining Everyday Thinking, last two paragraphs

“Consider how we would have used this testing process to refine early modern theories about the solar system. Copernicus had the planets traveling around the sun in epicyclical orbits. The best Ptolemaic theory had the sun and other planets traveling around the earth in more complex epicyclical orbits. Many experts believe that the best Ptolemaic theory was a better tool for predicting the overall trajectories of the planets than the Copernican theory was. If true, we would have rejected the Copernican theory as a tool for predicting the motion of the planets. All experts agree that the Copernican theory was a better tool for explaining the apparent retrograde motion of the planets and variations in the planets’ brightness. We would have accepted it as a tool for explaining the motion of the planets. It later proved its worth in this role by helping Kepler formulate his theory of planets traveling around the sun in elliptical orbits.

“Kepler’s theory was a better tool for predicting the motions of the planets than the best Ptolemaic theory. We would have accepted it as a tool for predicting the motions of the planets. Kepler’s theory was as at least as good at explaining the retrograde motion of the planets and variations in the planets’ brightness as the Copernican theory was. Further, it was simpler and more elegant. We would have accepted it as a tool for explaining the motions of the planets. It later proved its worth in this role by helping Newton formulate his theories of gravity and mechanics.”

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were deleted.

## Chapter 2, Science as a Process, last paragraph, fifth footnote

“The belief that science **is** the result rather than **the** process of refining thinking tends to blind us to the best problems to solve. It does not take a theory to beat a theory. It takes an intellectual tool to beat an intellectual tool. The RTS **research program** beat the EOQ theory.”

was changed to:

“The belief that science **ought to be a theory** (the result of a process of refining **everyday thinking**) rather than **a strategy for learning** (a process for refining everyday thinking / **research program**) tends to blind us to the best problems to solve. It does not take a theory to beat a theory. It takes an intellectual tool to beat an intellectual tool. The RTS strategy for learning beat the EOQ theory.”

## Chapter 2, Economic Science, first paragraph

Changed “**models** that explain” to “**stories** that **we use to** explain” in the second sentence.

Changed “predict” to “**help us to** predict” in the second sentence.

Changed “**theories**” to “**stories**” in the third sentence.

## Chapter 2, Economic Science, second paragraph

Changed “**intellectual tools**” to “**stories**” in the first sentence.

Changed “**tools**” to “**stories**” in the second sentence.

Changed “**statement**” to “**story**” in the last sentence.

## Chapter 2, Economic Science, third paragraph

Changed “**tools**” to “**stories**” in all (three occurrences).

## Chapter 2, Economic Science, last paragraph

Changed “**tools**” to “**stories**” in the first sentence.

## Chapter 2, *Refining Theories that We Use to Predict*, title

Changed “*Theories*” to “*Stories*.”

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## Chapter 2, *Refining Stories that We Use to Predict*, first paragraph

“We ought to refine the set of **theories** that we use to predict what will happen in economies by **testing how well they** help us to predict what will happen in economies.<sup>9</sup> **It is wise for us to assign this task to people who have the knowledge to do this task well.**”

was changed to:

“We ought to refine the set of **stories** that we use to predict what will happen in economies by **weeding out all stories that are not clear, concise, and logical. What remains is the set of precise stories that we use to predict what will happen in economies. We ought to refine this set by weeding out stories that fail to meet our (evolving) standards for helping us to predict what will happen in economies. What remains is the set of refined stories that we use to predict what will happen in economies.**”<sup>9</sup>”

“<sup>9</sup> This is compatible with the instrumental interpretation of Milton Friedman’s definition of (positive) economic science as “a body of tentatively accepted generalizations about economic phenomena that can be used to predict the consequences of changes in circumstances.” Friedman, Milton, “The Methodology of Positive Economics,” *Essays in Positive Economics*, (Chicago: University of Chicago Press, 1953), 39.”

## Chapter 2, *Refining Theories that We Use to Explain*, title

Changed “*Theories*” to “*Stories*.”

## Chapter 2, *Refining Stories that We Use to Explain*, first paragraph

“We ought to refine the set of **theories** that we use to explain what happens in economies by **testing how well they help us to find problems to solve in our quest to live wisely. It is foolish for us to assign this task to experts. This is because no one can explain to us how to live wisely, how to follow our ideal path toward living a good life. We ought to learn to do this for ourselves.**”<sup>10</sup>”

“<sup>10</sup> This clearly applies to refining the (microeconomic) theories that we as individuals seeking to live wisely use to explain what happens in economies. It also applies to refining the (macroeconomic) theories that we as individuals seeking to govern ourselves wisely use to explain what happens in economies. We ought to seek to change or abandon governments that hinder us from learning to live ever more wisely.”

was changed to:

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“We ought to refine the set of stories that we use to explain what happens in economies by weeding out all stories that are not clear, concise, and logical. What remains is the set of precise stories that we use to explain what happens in economies. We ought to refine this set by weeding out stories that fail to meet our (evolving) standards for helping us to find problems to solve. The rub is that we cannot agree on what it is that we ought to seek.

“As living beings, we seek to live well. As living beings with the ability to live wisely, we owe it to ourselves to live wisely. We owe it to ourselves to learn to live better than we currently know how to live.

“Defining what we ought to seek to be something other than what we need to live wisely leads us to act foolishly. Worse, it causes us to embed mistakes into the web of knowledge that we use to live, that is, into our markets, technologies, legal systems, languages, and cultures. The greatest danger is in public policy. We tend to discover and correct our private mistakes. When we act foolishly in our private lives, the results are often pathetic but rarely tragic. In contrast, policy makers often fail to discover and correct their mistakes. When they act foolishly, the results are often tragic. The classic example is the mercantile system, which defines what policy makers ought to seek to be precious metal coins and bullion.

“In his most famous work, *An Inquiry into the Nature and Causes of the Wealth of Nations*, Adam Smith provided the world with a better concept of what we ought to seek. Smith defined what we ought to seek to be the things that we want to consume.<sup>10</sup> This was a great advance over the mercantilist concept. However, it is not the best concept. We would progress much faster if we sought *what we need to live wisely* rather than *what we currently want to consume*.”

<sup>10</sup> In the opening sentence of *Wealth*, Smith speaks of nations working to provide the things that its people consume: “THE annual labour of every nation is the fund which originally supplies it with all the necessaries and conveniences of life which it annually consumes....” From the view of modern economics, this is a positive statement about what nations do. From the decision-oriented view of this work, it is an explanatory statement. We use explanatory statements to guide our actions, to help us to find problems to solve. Smith, Adam, *An Inquiry into the Nature and Causes of the Wealth of Nations*, (Edinburgh: 1776), reprinted in Project Gutenberg, <http://www.gutenberg.org/catalog>, (1 June 2006).”

### Chapter 2, *Refining Knowledge That We Use to Explain*, second paragraph

“To learn to live wisely we need to consider all knowledge useful in living wisely, which includes knowledge useful in consuming wisely.<sup>11</sup> We can do so by looking to our nature — our internal programming — to explain what we need to live wisely.<sup>12</sup> In biological terms, we can base the theories that we use to explain how to satisfy our needs on the set of all “teleonomic theories.”<sup>13</sup> We can then tighten these loose theories

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by weeding out members of the set of theories that we use to explain what we need to live wisely.”

“<sup>11</sup> Addressing this problem requires that we make controversial assumptions about our ultimate ends. The most important of these concerns whether an immaterial part of us survives the death of our bodies. Carl Menger, the economist who provided modern economics with its theory of consumption, chose to avoid these controversies by defining ‘wealth’ as consumer goods and the resources to produce consumer goods. Supporters of this definition of wealth believe it to be value-neutral. It actually supports the current state of the world by tending to blind us to the best problems to solve.”

“<sup>12</sup> We can separate our explanations of our needs from our explanations of how best to satisfy our needs by defining our needs and ultimate normative end tautologically. *Our needs are those things that we need to satisfy in order to live wisely and living wisely is what we achieve when we satisfy our needs.*”

“<sup>13</sup> Teleonomic theories are theories that look to our internal programming to explain motivation. Our beliefs and behaviors are evolving at a pace many orders of magnitude faster than the genetic level programming that underlies our higher level internal programming. Although we can improve the process by which our genetic programming develops into our higher-level programming, we cannot improve our higher level internal programming beyond the bounds set by our genetic programming. Therefore, we can safely assume that our fully realized internal programming is fixed. This may not always be the case. A major challenge of our era must be to accumulate the practical wisdom we will need to meet the challenges that will come with the ability to change our genetic programming.”

was changed to:

“If we accept the concept of science as a process, we can envision a science based on the concept of what we ought to seek as what we need to live wisely. Although we cannot agree on a story about what we need to live wisely, we can agree on a strategy for learning what we need to live wisely. The most successful such strategy involves looking to our nature — our internal programming — to explain what we need to live wisely.<sup>11</sup> Formally, we can base the stories that we use to explain what happens in economies on the set of all stories that we use to define what we need to live wisely.<sup>12</sup> We can then tighten these loose stories by weeding out members of the set of stories that we use to define what we need to live wisely.”

“<sup>11</sup> As a group, stories that look to our nature to explain how to live wisely are more successful than stories that look elsewhere. See Chapter 3 and Appendix B.”

“<sup>12</sup> Our beliefs and behaviors are evolving at a pace many orders of magnitude faster than the genetic level programming that underlies our higher level internal programming. Although we can improve the process by which our genetic

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programming develops into our higher-level programming, we cannot improve our higher level internal programming beyond the bounds set by our genetic programming. Therefore, we can safely assume that our fully realized internal programming is fixed. This may not always be the case. A major challenge of our era must be to accumulate the practical wisdom we will need to meet the challenges that will come with the ability to change our genetic programming.”

### **Chapter 2, *Refining Knowledge That We Use to Explain*, new sixth paragraph**

Changed “theories” to “stories” in the first sentence.

### **Chapter 2, *Refining Knowledge That We Use to Explain*, new seventh paragraph**

Changed “theories” to “stories” in the second sentence.

### **Chapter 2, *Defining Economic Science*, first paragraph**

Changed “theories” to “stories” in the first sentence.

Changed “economic science” to “it” in the last two sentences (2 occurrences).

### **Chapter 2, *Defining Economic Science*, footnote**

Changed “positivist view” to “view” in the first sentence.

### **Chapter 4, *Franklin's Curse*, last paragraph**

Changed “wisely” to “more wisely” in the first sentence.

### **Chapter 5, *Key Factors*, first paragraph, second and third sentences**

“One key factor is the freedom to choose. Another is the quality of doing what we ought to do.”

were changed to:

“One key factor is the freedom to decide. Another is the quality of deciding wisely.”

### **Chapter 5, *Lower Barriers to Trade*, first paragraph**

Added the sentence, “Competition promotes replacing non-knowledge resources with knowledge resources.”

Changed “tends to promote practical wisdom” to “promotes wisdom” in the new third sentence.



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## Chapter 5, Justice, second paragraph

Changed “wisely” to “**more** wisely” in all (4 occurrences).

## Chapter 5, Justice, third paragraph

Changed “wisely” to “**more** wisely” in all (4 occurrences).

## Chapter 5, Justice, third paragraph

Changed “**ever more wisely**” to “*more wisely*” in the last sentence.

## Appendix B, Goodness and Rightness, first paragraph

Changed “**identical** results” to “results” in the sixth sentence.

Reduced to a footnote at the end of the first sentence of the Summary section.

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## Changes in Version 2006.06.03

### Chapter 1, Excellence in Living Wisely, second paragraph

Changed “**Wise managers know that** choosing” to “**C**hoosing” in the first sentence.

Changed “**They**” to “**The wise**” in the second sentence.

### Chapter 1, Excellence in Living Wisely, third paragraph

“**They also help us to find mistakes.**”

was deleted.

### Chapter 1, Excellence in Living Wisely, last paragraph, last sentence

Changed “**managerial** concepts” to “concepts” in the first sentence.

### Chapter 2, Refining Everyday Thinking, third paragraph, second footnote, end

Added the sentences:

“**Better predictions help us to improve the accuracy of a given decision tree structure.  
Better explanations help us to improve the decision tree structure.**”

### Chapter 2, Science as a Process, first paragraph, first sentence

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“It is in our nature to learn to live good lives.”

was changed to:

“As living beings, it is in our nature to seek to live well. As intelligent beings, it is in our nature to learn to live well.”

### Chapter 2, Science as a Process, last paragraph

Changed “producers” to “expert producers” in the first sentence.

### Chapter 2, Economic Science, first paragraph

Changed “In other words” to “In short” in the last sentence.

### Chapter 2, *Refining Stories that We Use to Explain*, second paragraph

“As living beings, we seek to live well. As living beings with the ability to live wisely, we owe it to ourselves to live wisely. We owe it to ourselves to learn to live better than we currently know how to live.”

was changed to:

“As living beings, it is in our nature to seek to live well. As living beings with the ability to learn, we owe it to ourselves to learn to live better than we currently live. We owe it to ourselves to seek to live wisely.”

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## Changes in Version 2006.06.06

### Acknowledgments, ninth paragraph

“I am especially grateful for his explanation of his intellectual make-up [*Hayek on Hayek, An Autobiographical Dialogue*, (Chicago: University of Chicago Press, 1994), 134-5].”

was changed to:

““We shall not grow wiser before we learn that much that we have done was very foolish.””

### Chapter 2, Economic Science, first paragraph, fourth sentence

“As we saw in the EOQ/RTS example, this is not the case.”

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was deleted.

### Chapter 2, *Defining Economic Science*, title

Changed title to “*Moral Science*.”

### Chapter 5, *Consider the Justice of Interventions*, second paragraph, fourth sentence

“The foolish attempt to prohibit the sale of alcohol undermined the authority of government in the United States.”

was changed to:

“The attempt to prohibit alcohol during the roaring twenties undermined the authority of government in the United States.”

### Chapter 6, first paragraph

Changed “the wisdom of the virtuous circle” to “the wisdom of pursuing the virtuous circle” in the first and second sentences.

### Afterword, fourth paragraph

Changed “ever more” to “(ever more)” in the first sentence.

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## Changes in Version 2006.06.09

### Acknowledgments, fifth paragraph, fifth and sixth sentences

“My conscious mind could not get around the boundless problem of how a theory could be both useful (in predicting what happens in education markets) and foolish (as a guide for making career decisions). My unconscious mind would not let go of this problem.”

was changed to:

“My mind could not get around the boundless problem of how a theory could be both useful (in predicting what happens in education markets) and foolish (as a guide for making career decisions).”

### Chapter 2, *Refining Everyday Thinking*, end

Added the following paragraphs:

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“This will be hard for people who are used to the idea of testing stories that we use to explain by how well that they help us to predict.

“Two rules arise from this distinction. First, we ought to use the term ‘cause’ only with models that we use to explain. We explain causes. We predict effects. ‘Cause’ is a cue for ‘explain.’ Second, we need not worry about the realism of models that we use to predict. We need realism to help us to find problems to solve, not to help us to predict.”

### Chapter 2, Economic Science, last paragraph

Moved the ninth footnote from the end of the first paragraph of the next section.  
Added the paragraph:

“Two rules arise from this distinction. First, we ought to use the term ‘cause’ only with models that we use to explain. We explain causes. We predict effects. ‘Cause’ is a cue for ‘explain.’ Second, we need not worry about the realism of models that we use to predict. We need realism to help us to find problems to solve, not to help us to predict.”

### Reverence web links

Tested reference web links and updated web link dates.

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## Changes in Version 2006.06.10

### Chapter 1, Excellence in Living Wisely, last paragraph

Changed “problems” to “temporal problems” in the last sentence.

### Chapter 2, Refining Everyday Thinking, second paragraph, last three sentences

“What remains are stories about the world. We refine these stories by weeding out those that are not clear, concise, and logical. What remains is the set of precise stories about the world ( $S_i$ ).”

were changed to:

“What remains is the set of stories about the world ( $S_i$ ).”

### Chapter 2, Refining Everyday Thinking, fourth paragraph

“We refine our stories about the world by testing how well they perform their roles in decision-making. We refine the set of precise stories about the world ( $S_i$ ) by weeding

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out members that fail to **meet our empirical standards for predicting**.<sup>4</sup> What remains is the set of **refined** stories that we use to predict ( $S_2$ ). We also refine the set of **precise** stories about the world ( $S_1$ ) by weeding out members that fail to **meet our empirical standards for helping** us find problems to solve. What remains is the set of **refined** stories that we use to explain ( $S_3$ ):”

was changed to:

“We refine our stories about the world by testing how well they perform their roles in decision-making. We refine the set of stories about the world ( $S_1$ ) by weeding out stories that fail to predict **well**.<sup>4</sup> What remains is the set of stories that we use to predict ( $S_2$ ). We also refine the set of stories about the world ( $S_1$ ) by weeding out stories that fail to help **to** us find problems to solve **well**. What remains is the set of stories that we use to explain ( $S_3$ ):”

### **Chapter 2, Refining Everyday Thinking, end**

Added the paragraph:

“Some parts of the world appear to us to be simple enough for us to use a single story to predict and explain everything we need to predict and explain about this part of the world. Within these islands of simplicity, we test the stories that we use to explain by how well they help us to predict. When the stories that we use to explain predict well, we say that we have found the truth about this part of the world. If we are wrong about how simple this part of the world is, acting on what we believe to be the truth will yield results that we do not expect.”

### **Chapter 2, Economic Science, first paragraph, second and third sentences**

“Most economists believe that economics involves testing logical and elegant stories that we use to explain by how well they help us to predict. Economists using this method presume that stories that predict well also explain well.”

were deleted.

### **Chapter 3, Human Capital, Work, and Leisure, last paragraph**

“For more on the subjects of wealth and consumption, see Appendix C.”

was deleted.

### **Chapter 4, A Crude Look at the Whole, second paragraph, end**

Added the footnote:

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“<sup>4</sup> For another example of unexpected results caused by using a too simple model, see Appendix C.”

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## Changes in Version 2006.06.14

### Chapter 2, Refining Everyday Thinking, third paragraph, last footnote, last two sentences

“Better predictions help us to improve the accuracy of a given decision tree structure. Better explanations help us to improve the decision tree structure.”

was changed to:

“Better predictions help us to improve our assessments of uncertain events. Better explanations help us to improve the decision structure.”

### Chapter 2, Science as a Process, last paragraph

Changed “EOQ theory” to “EOQ model’s marginalist theory” in the last sentence of the first footnote.

Changed “definition” to “timeless concept of science” in the fourth sentence.

### Chapter 2, Economic Science, last paragraph, end

Added the footnote:

“<sup>10</sup> To students of Milton Friedman, these two rules will seem familiar. There is a twist. Friedman accepts the prevailing belief that science concerns results (theories) rather than processes (research programs). From this temporal view of science, the distinction between positive science (theories that describe what is) and normative science (theories that prescribe what ought to be) makes sense. From the timeless view of science put forth in this work, the distinction between positive science and normative science makes less sense. Research programs prescribe how we ought to describe the world. They are normative in means and positive in ends.”

### Chapter 2, Refining Stories that We use to Explain, fourth paragraph

Changed “we ought to seek” to “policy makers ought to seek” in the first sentence.

Changed “we ought to seek” to “they ought to seek” in the second sentence.

Changed “we sought” to “policy makers sought” in the last sentence.

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## Chapter 2, *Refining Stories that We use to Explain*, fifth paragraph

Changed “involves looking” to “looks” in the third sentence.

## Chapter 2, *Refining Stories that We use to Explain*, six paragraph

Changed “or our minds, or our spirits” to “only our minds, or only our spirits” in the second sentence.

## Chapter 2, Moral Science, end

Deleted the footnote:

“<sup>16</sup> This reflexive / recursive research program seeks to describe the world as it is in the process of becoming. From the view of modern economics, it is positive in ends (describing the world) and normative in means (prescribing how we ought to improve our descriptions of the world).”

## Chapter 3, Profit, footnote

Changed “timeless definition for the temporal task” to “timeless concept for the temporal task” in the second sentence.

## Chapter 5, *Lower Barriers to Trade*, first paragraph, end, footnote

Changed “determines” to “greatly influences” in the first sentence.

Changed “simplistic view” to “view” in the fourth sentence.

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## Changes in Version 2006.06.16

### Preface, last paragraph

“This research program yields a “God’s eye” view of life. Its concepts help us to find the problems that we ought to solve and the resources that we will need to solve them.”

was deleted.

### Chapter 1, Excellence in Living Wisely, title

Deleted “Wisely.”

### Chapter 1, Excellence in Living, third paragraph

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Changed “normative” to “**timeless (normative)**” in the second sentence.

Changed “**normative**” to “**timeless**” in the third, fifth, and sixth sentences.

Moved footnote from the end of the paragraph to the end of the second sentence..

### **Chapter 1, Excellence in Living, fourth paragraph**

Changed “**normative**” to “**timeless**” in the last sentence.

### **Chapter 1, Excellence in Living, last paragraph, last two sentences**

“**They help us** to plan our lives using timeless (**idealistic / cosmic**) models and work our plans using temporal (**pragmatic / worldly**) ones. **Timeless models help us to find temporal problems to solve.**”

was moved into a new paragraph and changed to:

“**To live wisely, we need both timeless (idealistic / cosmic) models and temporal (pragmatic / worldly) models. Timeless models help us to identify what we are likely to need in the future. Temporal models help us to make the most of what we currently have. To live wisely, we need to plan our lives using timeless models and work our plans using temporal ones. In military terms, we need to plan our lives using strategic models and work our plans using tactical ones.**”

### **Chapter 2, Refining Everyday Thinking, last paragraph**

Changed “islands of simplicity” to “islands of **apparent** simplicity” in the second sentence.

### **Chapter 2, Science as a Process, first paragraph**

Changed “**scientific** research program” to “research program” in the second sentence.

### **Chapter 2, Science as a Process, last paragraph**

Changed “**products**” to “**results**” in the last sentence.

### **Chapter 2, Economic Science, last paragraph**

Changed “explain” to “explain **how to live wisely**” in the second sentence.

### **Chapter 2, Refining Stories that We use to Predict, first paragraph**

Changed “remains is **the** set of precise stories” to “**will** remain is **a** set of precise stories” in the second sentence.



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Changed “remains is the set” to “will remain is a set” in the last sentence.

### Chapter 2, *Refining Stories that We use to Explain*, first paragraph

Changed “remains is the set of precise stories” to “ought to remain is a set of precise stories” in the second sentence.

Inserted the sentence:

“What ought to remain is a set of refined stories that we use to find problems to solve.”

Italicized the last sentence:

*“The rub is that we cannot agree on what it is that we ought to seek.”*

### Chapter 2, *Refining Stories that We use to Explain*, second paragraph

“As living beings, it is in our nature to seek to live well. As living beings with the ability to learn, we owe it to ourselves to learn to live better than we currently live. We owe it to ourselves to seek to live wisely.”

was changed to:

“As living beings, it is in our nature to live well. As intelligent beings, we ought to use our intellect to pursue the timeless end of living well. We ought to live wisely.”

### Chapter 2, *Refining Stories that We use to Explain*, fourth paragraph, footnote

Changed “view” to “temporal view” in the second sentence.

Changed “decision-oriented view” to “timeless view” in the third sentence.

### Chapter 2, *Refining Stories that We use to Explain*, seventh paragraph

Changed “normative” to “timeless” in the fourth sentence (2 occurrences).

### Chapter 2, *Moral Science*, first paragraph

Changed “stories that we use to explain” to “timeless stories that we use to explain how to live wisely” in the first sentence.

### Chapter 3, *Practical Wisdom*, first paragraph

Changed “normative” to “timeless” in the first sentence.

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### Chapter 4, Living Ever More Wisely, first paragraph, footnote, last sentences

“Modern economists recognize the roles that psychic income and transaction costs play in stewardship. They have been slow to recognize the potential benefits of inducing knowledge by removing resources. See Appendix D.”

were deleted.

### Chapter 4, Living Ever More Wisely, second paragraph

Changed “marginalists” to “modern economists” in the second sentence.

### Chapter 4, Uneven Flow, first paragraph

Changed “create” to “cause” in the first sentence.

### Chapter 4, Uneven Flow, third paragraph, first sentence

“Uneven flow of one resource tends to create uneven flow of other resources. Uneven flow of money and goods tends to cause uneven flow of labor. Uneven flow of labor tends to cause uneven flow of money and goods.”

was deleted.

### Chapter 4, Uneven Flow, new second paragraph, first sentence

“Uneven flow is a form of waste.”

was changed to:

“Uneven flow wastes resources.”

### Chapter 4, A Crude Look at the Whole, third paragraph, first sentence

“Experts are likely to learn much more about progress and turbulence from studying computer models of networks.”

“<sup>s</sup> Barabási, Albert-László *Linked, How Everything Is Connected to Everything Else and What It Means for Business, Science, and Everyday Life*, (New York: Plume, 2003).”

was changed to:

“Experts are likely to learn much more about progress and turbulence from studying computer models.”

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### Afterword, fourth paragraph

Changed “elites” to “**right wing** elites” in the fourth sentence.

### Appendix B, Timeless Logic, last paragraph

Changed “**normative**” to “**timeless**” in the last sentence.

### Appendix B, Timeless Logic, first paragraph

Changed “**normative**” to “**timeless**” in the first sentence.

### Appendix B, Human Needs, first paragraph

Changed “**normative**” to “**timeless**” in the second sentence.

### Appendix B, Balanced Excellence, second paragraph

Changed “**normative**” to “**timeless**” in the first sentence.

### Appendix B, Synthesis, first paragraph

Changed “**normative**” to “**timeless**” in the first sentence.

### Appendix D, *Folding in Processes*, third paragraph

Changed “**sub assembly**” to “**subassembly**” in the last sentence.

### Appendix D, *Machine Tools*, second paragraph

Changed “**normative**” to “**timeless**” in the second and fourth sentences.

### Appendix D, *Visibility*, second paragraph

Changed “yellow and red lights” to “yellow **lights or a single** red light” in the sixth sentence.

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## Changes in Version 2006.06.22

### Preface, first paragraph

Changed “twenty-**seven**” to “twenty-**eight**” in the first sentence.

Changed “**Stanford** MBA” to “MBA” in the second sentence.

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## Chapter 1, Excellence in Living, second paragraph

“In current parlance, these two concepts help us to “think outside the box.””

was changed to:

“In doing so, they help us to see the world anew.”

## Chapter 1, Excellence in Living, last paragraph

“To live wisely, we need both timeless (idealistic / cosmic) models and temporal (pragmatic / worldly) models. Timeless models help us to identify what we are likely to need in the future. Temporal models help us to make the most of what we currently have. To live wisely, we need to plan our lives using timeless models and work our plans using temporal ones. In military terms, we need to plan our lives using strategic models and work our plans using tactical ones.”

was merged with the previous paragraph and changed to:

“We can use this insight to help us plan our lives. We do so by distinguishing between timeless and temporal models. Timeless models help us to identify what we are likely to need in the future. Temporal models help us to make the most of what we currently have.<sup>7</sup> We ought to plan our lives using timeless models and work our plans using temporal ones.”

“<sup>7</sup> Timeless models are strategic, idealistic, and cosmic. Temporal models are tactical, pragmatic, and worldly.”

## Chapter 1, A Strategy for Learning, Title

Changed title to “A Timeless Model for Living Wisely.”

## Chapter 1, A Timeless Model for Living Wisely, second paragraph, first sentence

“<sup>8</sup> Decision-making is the process that begins with finding a problem to solve and ends with learning from experience. Formally, it includes (1) finding a problem to solve; (2) formulating alternatives; (3) evaluating alternatives; (4) choosing an alternative; (5) implementing the chosen alternative; and (6) learning from the experience. Most decisions do not justify all of these steps.”

## Chapter 2, Refining Everyday Thinking, fourth paragraph, footnote

Changed “soybean” to “bean” in the last sentence.

## Chapter 2, Refining Stories that We Use to Explain, second paragraph

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Changed “live wisely” to “**seek to** live wisely” in the last sentence.

### Chapter 4, first paragraph

Changed “elements” to “**parts**” in the last sentence.

### Chapter 4, second paragraph, first two sentences

“**Discontinuity is the most extreme form of non-linearity. Because of the nonlinear way in which we apply new information,** a small change can have a small effect, no effect, or a large effect.”

were merged into the first paragraph and changed to:

“**Due to these two discontinuities,** a small change can have a small effect, no effect, or a large effect.”

### Afterword, first paragraph

Changed “ **if** the conversation **lasts long enough, it** often turns” to “**these** conversations often turn” in the second sentence.

Deleted the last sentence:

“ **My answer is that these terms are not the most useful tools for thinking about politics today.**”

### Afterword, fourth paragraph, end

Added the following sentences:

“**Those who profess to guard our civil liberties ought to heed Justice Oliver Wendell Holmes famous dissent in the 1919 Abrams case in which he argued that the purpose of free speech is to support free experiment:**

**Persecution for the expression of opinions seems to me perfectly logical. If you have no doubt of your premises or your power and want a certain result with all your heart you naturally express your wishes in law and sweep away all opposition. To allow opposition by speech seems to indicate that you think the speech impotent, as when a man says that he has squared the circle, or that you do not care whole-heartedly for the result, or that you doubt either your power or your premises. But when men have realized that time has upset many fighting faiths, they may come to believe even more than they believe the very foundations of their own conduct that the ultimate good desired is better reached by free trade in ideas -- that the best test of truth is the power of the thought to get itself accepted in the competition of the market, and that truth is the only ground upon which their wishes safely can be carried out. That at any rate is the theory of our Constitution. It is an**

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experiment, as all life is an experiment. Every year if not every day we have to wager our salvation upon some prophecy based upon imperfect knowledge.”

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## Changes in Version 2006.06.23

### Chapter 3, Production, first paragraph

Changed “products” to “products **for sale**” in the first sentence (2 occurrences).

### Appendix A, Ohno's Vision, title

Changed title to “**Overview.**”

### Appendix A, Overview, first paragraph

Changed “**Toyota**” to “**his firm**” in the second sentence.

Changed “**imagined**” to “**envisioned**” in the third sentence.

Changed “**continuous**” to “**mass**” in the last sentence.

### Appendix A, Overview, third paragraph

Changed “**strategy for learning**” to “**timeless model**” in the first sentence.

Changed “**production** system” to “system” in the second sentence.

Changed “**engineers**” to “**experts**” in the second sentence.

### Appendix A, Overview, last paragraph

Changed “Toyota” to “Toyota **teams**” in the first sentence.

Changed “**strategy for learning**” to “**system**” in the first sentence.

Changed “**It has**” to “**They have**” in the second sentence.

### Chapter 3, Production, first paragraph

Changed “products” to “products **for sale**” in the first sentence (2 occurrences).

### Appendix D, Summary, first paragraph

Changed “(of **saleable** product)” to “of products **for sale**” in the six sentence.

## Changes in Version 2006.06.26

### Chapter 2, Economic Science, last paragraph, footnote

Changed “makes less” to “does not make” in the fifth sentence.

### Chapter 2, *Refining Stories that We Use to Explain*, third paragraph

Changed “what we need to live wisely” to “those things that we need to live wisely” in the first sentence.

### Chapter 2, *Refining Stories that We Use to Explain*, fifth paragraph

“If we accept the timeless concept of science as a process, we can envision an economic science based on the concept of what we ought to seek as what we need to live wisely. Although we cannot agree on a story about what we need to live wisely, we can agree on a strategy for learning what we need to live wisely. The most successful such strategy looks to our nature — our internal programming — to explain what we need to live wisely.<sup>12</sup> Formally, we can base the stories that we use to explain what happens in economies on the set of all stories that we use to define what we need to live wisely.<sup>13</sup> We can then tighten these loose stories by weeding out members of the set of stories that we use to define what we need to live wisely.”

<sup>12</sup> As a group, stories that look to our nature to explain how to live wisely are more successful than stories that look elsewhere. See Chapter 3 and Appendix B.”

<sup>13</sup> Our beliefs and behaviors are evolving at a pace many orders of magnitude faster than the genetic level programming that underlies our higher level internal programming. Although we can improve the process by which our genetic programming develops into our higher-level programming, we cannot improve our higher level internal programming beyond the bounds set by our genetic programming. Therefore, we can safely assume that our fully realized internal programming is fixed. This may not always be the case. A major challenge of our era must be to accumulate the practical wisdom we will need to meet the challenges that will come with the ability to change our genetic programming.”

was changed to:

“If we accept the timeless concept of science as a process, we can envision an economic science based on the concept of what we ought to seek as those things that we need to live wisely.<sup>12</sup> We can base the stories that we use to explain what happens in economies on the set of all stories that we use to define what we need to live wisely.<sup>13</sup> We can then tighten these loose stories by weeding out members of this set.<sup>14</sup>”

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“<sup>12</sup> Although we lack the knowledge to agree on a story about what we need to live wisely, we have the knowledge to agree on a research program for learning what we need to live wisely. As a group, stories that look to our nature to explain how to live wisely are more successful than stories that look elsewhere. See Chapter 3 and Appendix B.”

“<sup>13</sup> We do this by defining our needs and ends tautologically. *Our needs are those things we need to achieve our ends and our ends are those things we achieve by satisfying our needs.*”

“<sup>14</sup> Our beliefs and behaviors are evolving at a pace many orders of magnitude faster than the genetic level programming that underlies our higher level internal programming. Although we can improve the process by which our genetic programming develops into our higher-level programming, we cannot improve our higher level internal programming beyond the bounds set by our genetic programming. Therefore, we can safely assume that our fully realized internal programming is fixed. This may not always be the case. A major challenge of our era must be to accumulate the practical wisdom we will need to meet the challenges that will come with the ability to change our genetic programming.”

### Chapter 4, A Crude Look at the Whole, second paragraph, footnote

Changed “a too simple model” to “too simple a model” in the first sentence.

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## Changes in Version 2006.06.28

### Acknowledgments, last paragraph, end

Changed “professors” to “business school professors” in the last sentence.

### Preface, last paragraph, end

Added the sentence: “What follows is a concise guide to this research program.”

### Chapter 2, Science as a Process, last paragraph, footnote

Changed “science put forth in this work” to “consumers” in the last sentence.

### Chapter 3, *Pleasure and Pain*, third paragraph

Changed “interferes with” to “hinders” in the last sentence.

### Chapter 3, *Pleasure and Pain*, fourth paragraph



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Changed “interferes with” to “hinders” in the third sentence.

### Chapter 3, *Pleasure and Pain*, last paragraph

Changed “most basic” to “basic” in the third sentence.

### Chapter 3, Trade, first paragraph

“Trade is the voluntary exchange of goods. All means of trade consist of a trade relation and at least one transaction. We invest in trade relations in order to lower the cost of transactions. The cost of trading includes not only the cost of setting up new trade relations and the cost of individual transactions but also the cost of ending trade relations. A reputation for ending trade relations fairly tends to lower the cost of starting new trade relations.”

was changed to:

“Trade is the voluntary exchange of goods. The means of trade consists of a trade relation and at least one transaction. We invest in trade relations in order to lower the cost of transactions. The cost of trading includes not only the cost of starting trade relations and the cost of transactions but also the cost of ending trade relations. A reputation for ending trade relations fairly tends to lower the cost of starting new relations.”

### Chapter 3, Trade, first paragraph, footnote

Changed “Commercial” to “As Ronald Coase observed in his seminal paper, “The Theory of the Firm,” commercial” in the first sentence.

Changed “moving” to “slowly moving” in the last sentence.

### Chapter 3, *Trust*, second paragraph

Changed “promotes knowledge” to “promotes the use of knowledge” in the last sentence.

Changed “protecting knowledge from theft” to “protecting knowledge” in the last sentence.

### Chapter 3, *Three Common Misbeliefs*, title

Changed title to: “*Three Mistakes.*”

### Chapter 3, *Three Mistakes*, first paragraph

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“Three common **beliefs** hinder **our ability to** improve trade. The first is the belief that we cannot improve trade. This belief tends to blind us to **the potential of improving** trade. **Failing to see the benefits of improving trade** caused many **manufacturing engineers** to **perceive** the Toyota system as a **collection** of techniques **for cutting work-in-process (WIP)**. **The Toyota system is much more than a collection of techniques for cutting WIP. It is a strategy for learning.**”

was changed to:

“Three common **mistakes** hinder **improving** trade. The first is the belief that we cannot improve **the means of** trade. This belief tends to blind us to **better means of** trade. **This mistake** caused many **Western experts** to **see** the Toyota system as a **set** of techniques **rather than as** a strategy for learning.”

### Chapter 3, *Three Mistakes*, second paragraph

Changed “**common belief that hinders improving trade**” to “**mistake**” in the first sentence.

Changed “**a mahogany desk**” to “**teak**” in the third sentence.

Changed “**an otherwise identical desk**” to “**teak**” in the third sentence.

Changed “**purchasing products and services**” to “**Buying**” in the last sentence.

### Chapter 3, *Three Mistakes*, third paragraph

Changed “**common belief that hinders improving trade**” to “**mistake**” in the first sentence.

### Chapter 3, *Three Mistakes*, last paragraph

Changed “**hundreds of millions of hours annually**” to “**billions of hours**” in the first sentence.

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## Changes in Version 2006.06.29

### Chapter 2, *Refining Stories that We Use to Explain*, first paragraph

Changed “**cannot agree on**” to “**do not know exactly**” in the last sentence.

### Chapter 2, *Refining Stories that We Use to Explain*, fifth paragraph

Changed “**an economic science**” to “**a science**” in the first sentence.

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## Chapter 3, *Human Capital, Work, and Leisure*, first paragraph

Changed “**economic**” to “**temporal**” in the first sentence.

## Chapter 3, *Human Capital, Work, and Leisure*, first paragraph

Changed “**managerial**” to “**timeless**” in the first sentence.

## Afterword, third paragraph

Changed “those” to “those **on the left**” in the third sentence.

Changed “**famous dissent in the** 1919 Abrams case” to “1919 Abrams case **dissent**” in the third sentence.

## Appendix D, all

Changed “**engineers**” to “**managers**” in all (15 occurrences).

## Appendix D, Browning footnote

“Browning, Robert “Andrea del Sarto,” in **Robert Browning, ed. Adam Roberts (New York: Oxford University, 1997) 240-46.**”

was changed to:

“Browning, Robert “Andrea del Sarto,” in *English Poetry III: From Tennyson to Whitman*. Vol. XLII, The Harvard Classics, (New York: P. F. Collier and Son, 1909-1914), reprinted in Bartelby.com, <<http://www.bartleby.com/42/675.html>> (29 June 2006).”

## Appendix D, *Folding in Processes*, fourth paragraph

Changed “processes” to “**production** processes” in the last sentence.

## Appendix D, *Smoothing Flows*, third paragraph

Changed “**Production** managers” to “**Managers**” in the second sentence.

## Appendix D, *Inducing Knowledge*, last paragraph

Changed “**raising product quality and** improving adaptability” to “improving adaptability **and raising product quality**” in the last sentence.

## Appendix D, *Visibility*, title

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Changed title to “*Transparency*.”

### Appendix D, *Transparency*, first paragraph

Changed “one” to “a line worker” in the last sentence.

Changed “**production** system” to “system” in the last sentence.

### Appendix D, *Transparency*, last paragraph

Changed “**Production** managers” to “**Managers**” in the first sentence.

Changed “**visibility**” to “**transparency**” in the last sentence.

### Appendix D, Summary, first paragraph

Changed “of products for sale” to “(of products for sale)” in the sixth sentence.

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## Changes in Version 2006.06.30

### Chapter 1, Modern Economics’ Blind Spot, title

Changed title to “**Economic Science’s Blind Spot**.”

### Chapter 1, Economic Science’s Blind Spot, first paragraph

Changed “economics” to “**modern** economics” in the second sentence.

### Chapter 1, Economic Science’s Blind Spot, last paragraph

Changed “*excellence in means*” to “**learning-by-doing**” in the first sentence.

### Chapter 2, Economic Science, last paragraph, footnote

Changed “**consumers**” to “**the wise**” in the fourth sentence.

### Chapter 5, *Consider the Justice of Interventions*, title

Changed title to “*Judge Interventions*.”

### Chapter 5, *Control the Money Passively*, second paragraph

“**Central bankers affect economies by distorting prices. Distorting prices hides the best problems to solve. John Maynard Keynes warns us of the great danger in this power to**

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hide the best problems to solve, “There is no subtler, no surer means of overturning the existing basis of society than to debauch the currency. The process engages all the hidden forces of economic law on the side of destruction, and does it in a manner which not one man in a million is able to diagnose.”<sup>4</sup>

“The best monetary policy is the one that best helps us to learn how to live wisely. Central bankers face two major choices. **The first choice is** whether to control the supply or the price of money. **The second is** whether to **declare how they will decide far in advance. Ought they to be free to** surprise people? Of the four **choices** created by these two major choices, the least **distorting**, hence the **most helpful** to learning, is to control the money supply by means of **policies** declared far in advance.”

“<sup>4</sup> Keynes, John Maynard, *The Economic Consequences of the Peace*, (London: Macmillan and Co., Limited, 1919) reprinted in The World War I Document Archive, *Post 1918*, chapter 6, <<http://www.gwpda.org/1918p/keynespeace.htm>>, (9 June 2006).”

was changed to:

“The best monetary policy is the one that best helps us to learn how to live wisely. Central bankers face two major choices. **They must choose** whether to control the supply or the price of money. **They must also choose** whether to **act with or without warning**. Of the four **policies** created by these two choices, the **one that distorts prices the least**, hence **the one that is least harmful** to learning **how to live wisely**, is to control the money supply by means of **actions** declared far in advance. **Central bankers should not bury the problems that create uneven flow. They should not hide these problems from the people best able to solve them.**”<sup>4</sup>

“<sup>4</sup> **Central bankers affect economies by distorting prices. Distorting prices hides the best problems to solve. John Maynard Keynes warns us of the great danger in this power, “There is no subtler, no surer means of overturning the existing basis of society than to debauch the currency. The process engages all the hidden forces of economic law on the side of destruction, and does it in a manner which not one man in a million is able to diagnose.** Keynes, John Maynard, *The Economic Consequences of the Peace*, (London: Macmillan and Co., Limited, 1919) reprinted in The World War I Document Archive, *Post 1918*, chapter 6, <<http://www.gwpda.org/1918p/keynespeace.htm>>, (30 June 2006).”

### Appendix D, A Timeless View, first paragraph

“**Taiichi Ohno’s vision involves folding the production system in on itself. The resulting operational complexity creates uneven flow of work-in-process (WIP). Production teams find and solve problems that cause uneven flow. Solving these problems improves procedures, machine design, trading relations, and product design.**”

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was changed to:

“Producing wisely is a matter of replacing non-knowledge resources with knowledge. In complex systems, this process has two steps. The first step is replacing non-knowledge resources with knowledge in some part of the system. The second step is adapting other parts of the system to this change. The following uses the metaphor of folding and smoothing to explain this timeless process.”

### Appendix D, A Temporal View, title

Changed title to “Temporal Details.”

### Appendix D, Temporal Details, first paragraph

“The Toyota system is more than a collection of techniques for reducing WIP. It is a strategy for learning how to produce ever more wisely. This section describes some of the details of the Toyota system as it was in the early nineteen eighties.”

was changed to:

“Toyota teams learn to produce wisely by folding and smoothing. This section describes some of the details of this process as they were in the early nineteen eighties.”

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## Changes in Version 2006.07.11

### Acknowledgments, fifth paragraph, last sentence

“As Albert Einstein observed, perfection of means and confusion of ends seem to characterize our age.”

was deleted.

### Acknowledgments, seventh paragraph

Changed “Einstein” to “Albert Einstein” in the last sentence.

### Chapter 1, Excellence in Living Wisely, second paragraph, last sentence

“In doing so, they help us to see the world anew.”

was deleted.

### Chapter 1, A Timeless Model for Living Wisely, last paragraph, fourth sentence

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“The third is the liberty to live wisely **without unjustly interfering with others’ liberty to live wisely.**”

was changed to:

“The third is the liberty to live wisely, **which includes rights to property.**”

### **Chapter 1, A Timeless Model for Living Wisely, last paragraph, sixth sentence**

“Practical wisdom includes both tools to help us choose temporal ends and tools to help us choose means to **temporal** ends.”

was changed to:

“Practical wisdom includes both **timeless** tools to help us choose temporal ends and **temporal** tools to help us choose means to **these** ends.”

### **Chapter 5, *Provide a Moral Vision*, last paragraph**

Changed “**better**” to “**wiser**” in the second and third sentences.

Changed “wisely” to “**more** wisely” in the second and fourth sentences.

### **Chapter 5, *Control the Money Supply Passively*, footnote**

“**Central bankers affect economies by** **distorting prices. Distorting prices hides the best problems to solve.** John Maynard Keynes warns us of the **great** danger in this power, “There is no subtler, no surer means of overturning the existing basis of society than to debauch the currency.”

was changed to:

“**Monetary policies change prices. Changing prices changes our perceptions of problems. Students of Austrian economics will recognize this power of monetary authorities from their malinvestment theory of inflationary booms.** John Maynard Keynes warns us of the danger in this power, “There is no subtler, no surer means of overturning the existing basis of society than to debauch the currency.”

### **Chapter 5, Justice, first paragraph, second sentence**

“**There would be no need for governments to force us to share our wealth wisely.**”

was deleted.

### **Afterword, fifth paragraph, end**

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Added the sentence:

“Those on the right who believe that they know the whole truth ought to learn to see the world anew.”

## Appendix D, *Folding in Processes*, eighth paragraph

Changed “(WIP)” to “**work in process** (WIP)” in the last sentence.

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## Changes in Version 2006.07.17

### Preface, second paragraph

Added “**by blinding them to the possibility that markets would not clear**” to the end of the fourth sentence.

Changed “**analytical** tools” to “**the tools that I used to guide my actions**” in the last sentence.

### Preface, third and fourth paragraphs

“I have since learned that my wish for a strategy for living based on a theory was foolish. **Such a strategy would not be able to test the assumptions of its theory. It would deny testing core beliefs against experience. It would deny science.**

“**Rather than a strategy for living based on a theory**, I ought to have wished for a **strategy for** weeding out members of the set of theories that we use to explain how to live wisely. **Such a strategy would embrace testing core beliefs against experience. It would embrace science. It would be a research program for living wisely.** What follows is a concise guide to this **research program.**”

were changed to:

“I have since learned that my wish for a strategy for living based on a theory was foolish. I ought to have wished for a **method of** weeding out members of the set of theories that we use to explain how to live wisely. What follows is a concise guide to this **method.**”

### Chapter 1, *Excellence in Living Wisely*, last paragraph

“We can use this insight to help us **plan our** lives. We do so by distinguishing between timeless and temporal **models**. Timeless **models** help us to identify what we are likely to need in the future. Temporal **models** help us to make the most of what we currently



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have.<sup>7</sup> We ought to plan our lives using timeless **models** and work our plans using temporal ones.”

“<sup>7</sup> Timeless models are strategic, idealistic, and cosmic. Temporal **models** are tactical, pragmatic, and worldly.”

was changed to:

“We can use this insight to help us **to live more** wisely. We do so by distinguishing between timeless and temporal **tools**.<sup>7</sup> Timeless **tools** help us to identify what we are likely to need in the future. Temporal **tools** help us to make the most of what we currently have. We ought to plan our lives using timeless **tools** and work our plans using temporal ones.”

“<sup>7</sup> Timeless **tools (concepts, models, etc.)** are strategic, idealistic, and cosmic. Temporal **tools** are tactical, pragmatic, and worldly.”

### **Chapter 2, Refining Everyday Thinking, third paragraph**

Changed “**produce predictions and explanations**” to “**predict and explain**” in the first sentence.

Changed “assign” to “**to assign**” and “evaluate” to “**to evaluate**” in the fifth sentence.

Changed “find” to “**to find**” and “formulate” to “**to formulate**” in the sixth sentence.

### **Chapter 2, Science as a Process, last paragraph, fifth footnote**

Deleted “/ **research program**” in the first sentence.

### **Chapter 2, Economic Science, last paragraph**

“We explain causes. **We predict effects.** ‘Cause’ is a cue for ‘**explain.**’”

were changed to:

“We explain causes. ‘Cause’ is a cue for **a tool for helping us to find problems to solve.**”

### **Chapter 2, Economic Science, last paragraph, tenth footnote**

Changed “research programs” to “**strategies for learning / research programs**” in the second sentence.

Changed “**Research programs**” to “**Strategies for learning / research programs**” in the last sentence.

## Boundless Pragmatism, An Invariant View of Deciding Well

Change Archive for 2006 - 2007

### Afterword, fifth paragraph, last sentence

“Those on the right who believe that they know the whole truth ought to learn to see the world anew.”

was changed to:

“Those who believe that they have found the Truth ought to learn to see the world anew.”

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### Changes in Version 2006.07.24

#### Chapter 2, Science as a Process, first paragraph, first two sentences

“As living beings, it is in our nature to seek to live well. As intelligent beings, it is in our nature to learn to live well. It is in our nature to be both researchers and research subjects in the research program of, by, and for intelligent life.”

was changed to:

“Every time we choose (to act or not to act), we test our beliefs against experience. We bet our welfare on beliefs based upon imperfect knowledge. Others learn from our experiences. We, in turn, learn from theirs. *We are born to be both researchers and research subjects in the research program of, by, and for intelligent life.*”

#### Chapter 2, Science as a Process, last paragraph

Added the footnote:

“<sup>5</sup> Most scientists believe that they seek the truth per se rather than useful assays of the truth. In as much as their pursuit of the truth satisfies their need to be part of something greater than themselves, their pursuit of the truth is a religious quest. To true believers in the current concept of science, this timeless concept is heretical. For more on the relationship between science and religion, see Appendix B.”

Added “, which helps us to find problems to solve” to the fifth sentence.

Moved the footnote at the end of the fourth sentence to the end of the fifth sentence.

#### Chapter 2, Economic Science, first paragraph

Changed “change” to “timeless concept of science” in the first sentence.

#### Chapter 2, Economic Science, second paragraph, first sentence

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Deleted the footnote:

“*Soros, George, The Alchemy of Finance, (New York: Simon & Schuster, 1988).*”

### Chapter 2, *Moral Science*, first paragraph

Changed “**research program** of the research program” to “**scientific study** of the research program” in the second sentence.

### Chapter 5, *Lower Trade Barriers*, last paragraph, last sentence, footnote

Changed “**normative** end” to “**timeless** end” in the last sentence.

### Chapter 5, *Choosing Leaders*, title

Changed title to “**Leadership**.”

### Appendix B, *Schweitzer’s Universal Spiritual Need*, fourth paragraph, second sentence, footnote

Changed “**normative** end” to “**timeless** end” in the last sentence.

### Appendix B, *Synthesis*, first paragraph, first sentence, footnote

Changed “**normative** end” to “**timeless** end” in the last sentence.

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## Changes in Version 2006.07.26

### Chapter 1, *Setting Words Aright*, first paragraph

Changed “**They**” to “**Concepts**” in the last sentence.

### Chapter 1, *Setting Words Aright*, second paragraph

Changed “**others**” to “**other resources**” in the second sentence.

Changed “**they**” to “**knowledge resources**” in the third sentence.

### Chapter 1, *Setting Words Aright*, last paragraph

Changed “**knowledge**” to “**concepts**” in the first sentence (2 occurrences).

### Chapter 1, *Economic Science’s Blind Spot*, first paragraph

## **Boundless Pragmatism, An Invariant View of Deciding Well**

Change Archive for 2006 - 2007

Changed “**drawback**” to “**flaw**” in the second sentence.

### **Chapter 1, Excellence in Living, last paragraph**

Changed “**ought**” to “**owe it to ourselves**” in the last sentence.

### **Chapter 1, A Timeless Model for Living Wisely, first paragraph, footnote**

Changed “decisions **do not**” to “**of our decisions are too small to**” in the last sentence.

### **Chapter 2, Economic Science, first paragraph**

Changed “what we **ought**” to “what **it is that we owe to ourselves**” in first sentence.

### **Chapter 2, Economic Science, third paragraph, footnote**

Changed “**chaos theory**” to “**complex adaptive system**” in last sentence.

### **Chapter 2, *Refining Stories that We Use to Predict*, first paragraph**

Changed “**ought**” to “**owe it to ourselves**” in the first and third sentences.

### **Chapter 2, *Refining Stories that We Use to Explain*, first paragraph**

Changed “**ought**” to “**owe it to ourselves**” in the first and third sentences.

Changed “**ought to**” to “**should**” in the second and fourth sentences.

Changed “**ought**” to “**owe to ourselves**” in the last sentence.

### **Chapter 2, *Refining Stories that We Use to Explain*, second paragraph**

Changed “**ought**” to “**owe it to ourselves**” in the first sentence.

Changed “**ought**” to “**owe it to ourselves**” in the last sentence.

### **Chapter 2, *Refining Stories that We Use to Explain*, fourth paragraph**

Changed “**much faster**” to “faster” in the last sentence.

### **Chapter 2, *Refining Stories that We Use to Explain*, sixth paragraph**

Changed “**ought**” to “**owe it to ourselves**” in the first sentence.

### **Chapter 2, *Refining Stories that We Use to Explain*, seventh paragraph**

# Boundless Pragmatism, An Invariant View of Deciding Well

Change Archive for 2006 - 2007

Changed “ought” to “owe it to ourselves” in the first sentence.

## Chapter 2, *Moral Science*, first paragraph

Changed “ought” to “owe it to ourselves” in the first sentence.

## Chapter 4, *Living Ever More Wisely*, first paragraph

Changed “Progress” to “Living more wisely” in the second sentence.

## Chapter 4, *Smoothing Flow*, first paragraph

Changed “decisions cause” to “decision-making causes” in the first sentence.

Changed “decisions also worsen” to “decision-making also worsens” in the third sentence.

## Chapter 4, *A Crude Look at the Whole*, first paragraph

Changed “living more wisely” to “experimenting with new ways of living more wisely” in the third sentence.

## Chapter 4, *A Crude Look at the Whole*, last paragraph, footnote

Changed “economists, particularly Ludwig von Mises,” to “School economists” in the first sentence.

Changed “scientists, notably physicist Stephen Wolfram,” to “complex adaptive system scientists” in the second sentence.

## Chapter 5, *Liberty*, first paragraph

Changed “leaders and policymakers” to “government policymakers” in the last sentence.

## Chapter 5, *Provide Moral Vision*, first paragraph

Changed “ought” to “owe it to ourselves” in the second sentence.

## Chapter 5, *Judge Interventions*, first paragraph

Changed “Policymakers” to “Government policymakers” in the first sentence.

## Chapter 5, *Lower Trade Barriers*, first paragraph

Changed “ought” to “owe it to ourselves” in the second sentence.

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## Chapter 5, Justice, second paragraph

Changed “Policymakers” to “Government policymakers” in the first sentence.

## Chapter 5, Leadership, first paragraph

Changed “leaders” to “government policymakers” in the second paragraph.

## Chapter 6, first paragraph

Changed “ought” to “owe it to ourselves” in the last sentence.

## Chapter 6, second paragraph

Changed “ought” to “need” in the first sentence.

Changed “ought to help others to live wisely” to “owe it to ourselves to help others live wisely” in the first sentence.

## Afterword, third paragraph

Changed “ought” to “owe it to themselves” in the first sentence.

## Afterword, third paragraph

Changed “ought” to “owe it to themselves” in the first sentence.

## Afterword, last paragraph

Changed “nativist” to “nationalist” in the second sentence.

## Appendix B, *Secular Humanism*, first paragraph

Changed “ought” to “owe it to themselves” in the second sentence.

## Appendix B, *Secular Humanism*, last paragraph

Changed “ought” to “owe it to themselves” in the second sentence.

## Appendix B, *Religious Fundamentalism*, last paragraph

Changed “ought” to “owe it to themselves” in the second sentence.

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Changes in Version 2006.08.04

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Change Archive for 2006 - 2007

### Appendix B, Timeless Logic, last paragraph

Changed “timeless end” to “timeless **ultimate** end” in the last sentence.

### Appendix B, Balanced Excellence, last paragraph

Changed “mystical **experience**” to “mystical **oneness**” in the last sentence.

### Appendix B, Heroism, title

Changed title to “**Heroic Death.**”

### Appendix B, Heroic Death, last paragraph, second sentence

“**We owe it to ourselves to understand the ignorance at the heart of all forms of ritual death.**”

was deleted.

### Appendix B, Heroic Death, last paragraph, last sentence

“*Fools and knaves ritualize heroic death.*”

was put into a new paragraph and changed to:

“*Those who ritualize heroic death are either fools or knaves.*”

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## Changes in Version 2006.08.12

### Chapter 1, Excellence in Living, last paragraph

Changed “tools” to “tools (**concepts, models, etc.**)” in the second sentence.

### Chapter 1, Excellence in Living, last paragraph, footnote

“Timeless tools (**concepts, models, etc.**) are strategic, **idealistic, and cosmic**. Temporal tools are tactical, **pragmatic, and worldly.**”

was moved to the end of the paragraph and changed to:

“**In military terms**, timeless tools are strategic **and** temporal tools are tactical. **We owe it to ourselves to plan our lives using strategic tools and work our plans using tactical ones.**”

# Boundless Pragmatism, An Invariant View of Deciding Well

Change Archive for 2006 - 2007

## Chapter 2, Refining Everyday Thinking, last paragraph

Changed “take to be the truth” to “believe to be the truth” in the last sentence.

## Chapter 2, Refining Everyday Thinking, last paragraph

Deleted “everything we need to predict and explain about this part of the world” from the first sentence.

## Chapter 2, Science as a Process, last paragraph

Deleted “, which helps us to find problems to solve” from the fifth sentence.

## Chapter 2, Economic Science, first paragraph

Changed “In short” to “In other words” in the last sentence.

## Chapter 2, Economic Science, second paragraph and third paragraphs

“To make matters worse, there is a complex (reflexive / recursive) dynamic between the stories that we use to guide our actions and reality. *We base these stories on reality. Our actions change reality.* Consider the statement, “Tulips are a good investment.” If enough people use this story to guide their actions, the price of tulips will rise enough for tulips to become a poor investment.

“The dynamic between the stories that we use to guide our actions and reality gives rise to a wide variety of phenomena, which range from simple speculative bubbles to complex systems of human organizations. We can think about this dynamic as the interplay of two tendencies of these stories. The first is their tendency to become more popular, which, in part, is due to the lock-in effect created by the inexhaustibility of knowledge. The second is their tendency to undermine the conditions on which we base them. Repeatedly using these stories to guide our actions without considering how our actions change reality tends to lead us ever further away from ideal paths toward living good lives.<sup>8</sup> The harmony of these two tendencies is a siren song.

“If we all acted wisely all of the time, we would not need to distinguish between the stories that we use to predict and those that we use to explain. Given that we all do not act wisely all of the time, we ought to distinguish between them.”

“<sup>8</sup> Western philosophers are likely to associate the second tendency with Hegel’s dialectic. Chinese philosophers are likely to associate it with Lao Tzu: “The Way that can be known is not the eternal Way.” In complex adaptive system terms, the compounding of errors leads us away from “attractors” that “emerge” from our teleonomic programming.”

was changed to:



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“If we all acted wisely all of the time, we would not need to distinguish between the stories that we use to predict and those that we use to explain.<sup>8</sup> Given that we all do not act wisely all of the time, we ought to distinguish between them.”

“<sup>8</sup> An apparent complicating factor here is the complex (reflexive / recursive) dynamic between the stories that we use to guide our actions and reality. The existence of this dynamic, which arises from our ignorance, does not conflict with our need to distinguish between the stories that we use to predict what will happen and those that we use to explain what happens. See Appendix E.”

### **Chapter 2, Economic Science, new second paragraph, second footnote**

Moved this footnote, which references Friedman’s *The Methodology of Positive Economics*, to the end of the *Refining Stories that We Use To Predict* section.

### **Chapter 2, Refining Stories that We Use to Explain, first paragraph**

Changed “should **to**” to “should” in the second and fourth sentences.

### **Afterword, third paragraph**

Changed “Holmes 1919 Abrams case dissent **in which he argued**” was changed to “Holmes’s **argument**” in the fourth sentence.

Added the footnote:

“<sup>2</sup> Holmes’s dissent to the decision of *Abrams v. U. S.*, 250 U.S. 616 (1919).”

### **Afterword, fourth paragraph**

Changed “**have found**” was changed to “**know**” in the last sentence.

### **Appendix B, Heroic Death, second paragraph, last sentence**

Added the footnote:

“**Aristotle. *Nicomachean Ethics*, book 10 chapter 4.**”

### **Appendix D, A Finer Timeless View, first paragraph**

Changed “this **timeless** process” was changed to “**Toyota’s approach to this process**” in the last sentence.

### **Appendix E, Reflexivity**

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Change Archive for 2006 - 2007

Used what had been the second and third paragraphs of the Economic Science section as the first two paragraphs of Appendix E. Eliminated the footnote.

Added the following paragraph:

“We owe it to ourselves to base the stories that we use to guide our actions on reality. Reality contains at least two timeless elements that are critical to avoiding such major catastrophes as environmental disasters and religious wars. The first is inexhaustibility of knowledge. The second is our spiritual need to revere life. If we are to avoid these catastrophes, we need to think in terms of timeless ideals (ideal paths through time) rather than temporal ideals (ideal states of the world). To do so wisely, we need to distinguish between the stories that we use to predict what will happen and the stories that we use to explain what happens.”

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### Changes in Version 2006.08.18

#### Preface, Excellence in Living, second paragraph

Changed “**Black-Scholes** model would later lead **many traders** astray by blinding **them** to the possibility **that markets would not clear**” to “economic order quantity (EOQ) model would later lead **me** astray by blinding **me to the possibility of learning**” in the second sentence.

#### Chapter 1, Excellence in Living, second paragraph, last sentence

“This pair of concepts helps **us** to divide the problem of how best to pursue **our** ultimate end into easier to solve problems without losing sight of **our** ultimate end.”

was changed to:

“This pair of concepts helps **the wise** to divide the problem of how best to pursue **their** ultimate ends into easier to solve problems without losing sight of **their** ultimate ends.”

#### Chapter 1, Excellence in Living, second paragraph, footnote, fourth through sixth sentences

“**All organization members would seek to be efficient. All members with superiors would leave matters of effectiveness to their superiors. The distinction between efficiency and effectiveness would depend on one's level in the hierarchy.**”

was changed to:

“**What would be a matter of efficiency at a high level in the organization would be a matter of effectiveness at a lower level.**”

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## Chapter 1, A Timeless Model for Living Wisely, last paragraph

Changed “willingness and ability to act” to “knowledge of how to decide” in the third sentence.

## Chapter 2 Refining Everyday Thinking, third paragraph, first footnote

Changed “[requires] that we know” to “calls for knowing” in the sixth sentence.

## Chapter 2 Refining Everyday Thinking, last paragraph, end

Added the following sentences:

“At best, such actions cause nothing more than minor unintended consequences. At worst, they embed mistakes into our stocks of knowledge that will cause major catastrophes.”

## Chapter 2, Economic Science, second paragraph, footnote, last two sentences

“The existence of this dynamic, which arises from our ignorance, does not conflict with our need to distinguish between the stories that we use to predict and those that we use to explain. See Appendix E.”

were changed to:

“So long as this complex dynamic does not prevent us from representing reality as a decision tree model, it does not eliminate our need to distinguish between the stories that we use to predict and those that we use to explain. For more about this dynamic, see Appendix E.”

## Chapter 2, Economic Science, last paragraph

Changed “models” to “stories” in the second sentence.

Changed “models” to “stories” in the fourth sentence.

## Chapter 2, *Refining Stories that We Use to Explain*

Changed “policy maker” to “policymaker” in all (4 occurrences).

## Chapter 3, Two Types of Models, title

Changed title to “Two Types of Tools.”

## Chapter 3, Timeless Tools, first paragraph

# Boundless Pragmatism, An Invariant View of Deciding Well

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Changed “**models**” to “**tools**” in the first sentence.

## Chapter 3, Profit, first paragraph

Changed “return on **practical wisdom**” to “**expected** return on **the knowledge of how to decide wisely**” in the first sentence.

Deleted the second sentence, “**We profit from acting wisely.**”

Changed “**live**” to “**decide**” in the new second sentence (2 occurrences).

## Chapter 3, Profit, first paragraph, footnote, first two sentences

“**This decision science based definition of profit tells us to invest in practical wisdom, which includes the knowledge of how to manage uncertainty wisely. We should never use this timeless concept for the temporal task of assessing practical wisdom.**”

were changed to:

“We should never use this timeless concept **of profit** for the temporal task of assessing **knowledge of how to decide wisely.**”

## Chapter 3, Profit, first paragraph, footnote

Changed “**wise decision-making**” to “**deciding wisely**” in the second sentence.

Changed “**poor decision-making**” to “**deciding foolishly**” in the fourth sentence.

## Chapter 4, Living Ever More Wisely, title

Changed title to “**Progress.**”

## Chapter 4, Progress, first paragraph, first two sentences

“**To live wisely is to seek to live ever** more wisely. Living more wisely is a matter of converting new information into new applications of knowledge.<sup>2</sup>”

was changed to:

“**We progress by deciding** more wisely.<sup>2</sup> **Deciding** more wisely is a matter of converting new information into new applications of knowledge.”

## Chapter 4, A Crude Look at the Whole, first paragraph

Changed “**live**” to “**decide**” in the first sentence.

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Changed “*living*” to “*deciding*” in the second and third sentences.

### Chapter 5, *Provide Moral Vision*, first paragraph

Changed “find” to “*to find*” in the last sentence.

### Chapter 5, *Provide Moral Vision*, second paragraph

Changed “*more* wisely” to “wisely” in the last sentence.

### Chapter 5, *Justice*, last paragraph

Changed “*live*” to “*decide*” in the last sentence.

### Afterword, third paragraph, footnote

“*Holmes’s dissent to the decision of* *Abrams v. U S* , 250 U.S. 616 (1919).”

was changed to:

“*Abrams v. United States*, 250 U.S. 616, 630 (1919) (*Holmes, J., dissenting*).”

### Appendix D, *Temporal Details*, first paragraph, footnote

Changed “*seminar*” to “*conference*” in the first sentence.

Changed “*two week* tour of *JIT manufacturing plants*” to “*factory* tour” in the first sentence.

Changed “*lectured at* both *events*” to “*spoke to* both *groups*” in the last sentence.

### Appendix E, *Reflexivity*, last paragraph, last two sentences

“If we are to avoid these catastrophes, we need to *think in terms of* timeless ideals (*ideal paths through time*) rather than temporal ideals (*ideal states of the world*). *To do so wisely*, we need to *distinguish between the stories that we use to predict what will happen and the stories that we use to explain what happens.*”

was changed to:

“If we are to avoid these catastrophes, we need to *pursue the* timeless ideal of all intelligent life *deciding wisely*, which aims at the best of all possible histories for the whole of life. This timeless ideal is *wiser than the* temporal ideal of all of us *satisfying our wants efficiently*, which aims at a state of the world in which none of us can become better off without making at least one of us worse off.”

**Changes in Version 2006.08.22**

**Chapter 1, Excellence in Living, third paragraph**

Changed “living” to “**how best to** live” in the first sentence.

**Chapter 2, Refining Everyday Thinking, last paragraph**

Changed “will cause” to “will **in time** cause” in the last sentence.

**Chapter 5, *Provide Moral Vision*, last paragraph**

Changed “how to live wisely” to “how **best** to live wisely” in the first sentence.

**Afterword, third paragraph**

Changed “those **on the left**” to “those” in the third sentence.

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**Changes in Version 2006.08.24**

**Chapter 1, Economic Science's Blind Spot, fourth paragraph**

Changed “difficult” to “**hard**” in the fifth sentence.

**Chapter 3, *Pleasure and Pain*, second paragraph**

Changed “difficult” to “**hard**” in the third sentence.

**Chapter 3, *Trust*, second paragraph**

Changed “**more difficult**” to “**harder**” in the second sentence.

**Appendix B, Timeless Logic, first paragraph**

Changed “difficulty” to “**problem**” in the first sentence.

**Appendix B, Timeless Logic, last paragraph**

Changed “**ultimate** end” back to “end” in the last sentence.

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# Boundless Pragmatism, An Invariant View of Deciding Well

Change Archive for 2006 - 2007

## Changes in Version 2006.08.26

### Chapter 4, title

Changed “Progress and Turbulence” to “Progress.”

### Chapter 4, Progress, start

Added the section, **The Timeless Ideal**:

“Modern economics aims at the temporal ideal of a state of the world in which none of us may be made better off without making at least one of us worse off. We progress toward this ideal by acting efficiently. In contrast, the research program of, for, and by intelligent life aims at the timeless ideal of the best of all possible futures for the whole of life. We progress toward this ideal by deciding ever more wisely.”

### Chapter 4, Progress, title

Changed title to “**Turbulence**.”

### Chapter 4, Turbulence

“**We progress by deciding more wisely.**<sup>2</sup> Deciding more wisely is a matter of converting new information into new applications of knowledge. This process has two discontinuities. First, the way in which we turn new information into new useful knowledge is discontinuous. New information may or may not cause us to form a mental pattern that leads to new useful knowledge. Second, the decision to apply new knowledge is discontinuous. New useful knowledge may or may not cause us to apply new useful knowledge. Due to these two discontinuities, a small change can have a small effect, no effect, or a large effect. A small rise in the price of a raw material might (1) cause firms to react as modern economists predict; (2) have no immediate effect; or (3) trigger a firm to adopt a new process that changes the industry.

“**Applying new useful knowledge causes a ripple of change to flow through an economy. These ripples interact with one another in unpredictable ways. For example, the simultaneous rise in the price of steel and fall in the price of plastic is likely to cause a more rapid substitution of plastic for steel than if the price of steel rises a month after the price of plastic falls.**”

“<sup>2</sup> **Inherent in this recursionist concept of progress is the belief that intelligent beings ought to be stewards for the whole of life.**”

were changed to:

“Deciding more wisely is a matter of converting new information into new applications of knowledge in our quest to live wisely. **Each new application of**

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knowledge creates a ripple of change that flows through the economy. These ripples interact with one another in unpredictable ways.<sup>2</sup> For example, the simultaneous rise in the price of steel and fall in the price of plastic is likely to cause a more rapid substitution of plastic for steel than if the price of steel rises a month after the price of plastic falls. *Progress creates turbulence in the flow of economic resources.*”

“<sup>3</sup> In mathematical terms, progress involves two types of discontinuities. First, the way in which we turn new information into new useful knowledge is discontinuous. New information may or may not cause us to form a mental pattern that leads to new useful knowledge. Second, the decision to apply new knowledge is discontinuous. New useful knowledge may or may not cause us to apply new useful knowledge. Because of these discontinuities, a small change can have a small effect, no effect, or a large effect. A small rise in the price of a raw material might (1) cause firms to react as modern economists predict; (2) have no immediate effect; or (3) trigger a firm to adopt a new process that changes the industry.”

### Chapter 4, Smoothing Flow

Changed “causes uneven flow” to “worsens turbulence” in the first sentence of the first paragraph.

Merged this section with the preceding section.

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## Changes in Version 2006.08.31

### Chapter 2, Economic Science, second paragraph, footnote

“<sup>8</sup> An apparent complicating factor is the complex (reflexive / recursive) dynamic between the stories that we use to guide our actions and reality. So long as this complex dynamic does not prevent us from representing reality as a decision tree model, it does not eliminate our need to distinguish between the stories that we use to predict and those that we use to explain. For more about this dynamic, see Appendix E.”

was deleted.

### Chapter 3, Wealth, last sentence.

Added the footnote:

“This teleonomic definition of wealth is not compatible with the current national accounting scheme. See Appendix C.”

### Chapter 4, Turbulence, second paragraph, footnote



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<sup>2</sup> In mathematical terms, progress involves two types of discontinuities. First, the way in which we turn new information into new useful knowledge is discontinuous. New information may or may not cause us to form a mental pattern that leads to new useful knowledge. Second, the decision to apply new knowledge is discontinuous. New useful knowledge may or may not cause us to apply new useful knowledge. Because of these discontinuities, a small change can have a small effect, no effect, or a large effect. A small rise in the price of a raw material might (1) cause firms to react as modern economists predict; (2) have no immediate effect; or (3) trigger a firm to adopt a new process that changes the industry.”

was promoted to the new **Computer Models** section and changed to:

“In mathematical terms, progress involves two types of discontinuities. First, the way in which we turn new information into new **applications of** useful knowledge is discontinuous. New information may or may not cause us to form a mental pattern that leads to new useful knowledge. Second, the decision to apply new knowledge is discontinuous. New useful knowledge may or may not cause us to apply new useful knowledge. Because of these discontinuities, a small change can have a small effect, no effect, or a large effect. A small rise in the price of a raw material might (1) cause firms to react as modern economists predict; (2) have no immediate effect; or (3) trigger a firm to adopt a new process that changes the industry. **To explain this, we must explain the dynamics of knowledge in use, including the complex dynamic between the stories that we use to guide our actions and reality.**<sup>3</sup> We are far from being able to do so.”

<sup>3</sup> See Appendix E.”

### Chapter 4, A Crude Look at the Whole, first paragraph

Changed “**decide**” to “**live**” in the first sentence.

Changed “**deciding**” to “**living**” in the second sentence.

Changed “**deciding**” to “**living**” in the third sentence.

### Chapter 4, A Crude Look at the Whole, second paragraph, footnote

“**For another example of unexpected results caused by using too simple a model, see Appendix C.**”

was deleted.

### Chapter 4, A Crude Look at the Whole, last paragraph

Changed “**Experts are likely to learn much more**” to “**In time, experts will learn more**” in the first sentence.

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Moved paragraph to the end of the new **Computer Models** section.

## Chapter 4, Franklin's Curse

“This chapter rebuts the widely held beliefs that (1) the rich are willing to give up some liberty to purchase economic security and (2) socialism would rid us of capitalism's “gales of creative destruction.”<sup>6</sup> These beliefs are not the most useful for living wisely. More useful are the beliefs that (1) the wise are willing to accept turbulence as a regrettable result of progress and (2) socialism postpones turbulence by retarding progress. Those who give up essential liberty to purchase a little safety retard progress. In as much as the rest of the world continues to progress, they sow the seeds of catastrophe. As Benjamin Franklin wrote, they deserve neither liberty nor safety.

“We owe it to ourselves to learn to live more wisely. We owe it to ourselves to learn to thrive in winds and survive in gales of creative destruction.”

“<sup>6</sup> Schumpeter, Joseph, *Capitalism, Socialism, and Democracy*, (New York: Harper & Row, 1942).”

was merged with the previous section and changed to:

“In as much as the rest of the world continues to progress, they **lead to** catastrophe.

“We owe it to ourselves to learn to live more wisely. We owe it to ourselves to learn to thrive in winds and survive in gales of creative destruction.”

## Chapter 5, Liberty, first paragraph

Changed “**policymakers**” to “**officials**” in the last sentence.

## Chapter 5, Justice, second paragraph

Changed “**policymakers**” to “**officials**” in the first sentence.

## Chapter 5, Leadership, title

Changed title to “**Choosing Governments.**”

## Chapter 5, Choosing Governments, first paragraph

Changed “government **policymakers**” to “**governments**” in the second sentence.

## Afterword, third paragraph

Changed “**nanny** state” to “government” in the second sentence.

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Changed “Those” to “People” in the third sentence.

### Afterword, fourth paragraph

Changed “Those” to “People” in the last sentence.

### Appendix C, second paragraph

Changed “problem” back to “problem **here**” in the first sentence.

### Appendix C, last paragraph

Changed “catastrophe” to “**major** catastrophe” in the last sentence.

### Appendix E, title quotation attribution

Changed “Tao Te Ching, chap 1.” to “*Tao Te Ching*, Trans by John R. Leebrick (1980), chap 1, line 1, reprinted in Lao Tzu: *Tao Te Ching* (100+ Translations of Chapter 1), <<http://www.bopsecrets.org/gateway/passages/tao-te-ching.htm>> (30 August 2006).”

### Appendix E, last paragraph

“We owe it to ourselves to base the stories that we use to guide our actions on reality. Reality **contains at least two timeless elements that are critical to avoiding such major catastrophes as environmental disasters and religious wars. The first is the inexhaustibility of knowledge. The second is our spiritual need to revere life. If we are to avoid these catastrophes, we need to pursue the timeless ideal of all intelligent life deciding wisely, which aims at the best of all possible histories for the whole of life. This timeless ideal is wiser than the temporal ideal of all of us satisfying our wants efficiently, which aims at a state of the world in which none of us can become better off without making at least one of us worse off.**”

was changed to:

“We owe it to ourselves to base the stories that we use to guide our actions on reality. Reality **includes the** inexhaustibility of knowledge **and** our spiritual need to revere life. **Including these two timeless elements in our models of how to live makes our models open-ended. Ignoring these two timeless elements greatly increases our risk of suffering environmental disasters, patriotic wars, religious strife, and other catastrophes. We can be wise or we can be certain. We cannot be both wise and certain.**”

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Changes in Version 2006.09.05

# Boundless Pragmatism, An Invariant View of Deciding Well

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## Chapter 1, Excellence in Living, last paragraph

Changed “the future” to “our quest to live wisely” in the second sentence.

Added “in solving current problems” to the third sentence.

## Chapter 2, Refining Everyday Thinking, last paragraph

Changed “mistakes into our stocks of knowledge that in time will cause” to “mistakes that lead to major catastrophes into our stocks of knowledge in use” in the last sentence.

## Chapter 2, Economic Science, last paragraph, footnote

Changed “the wise” to “science” in the fourth sentence.

## Chapter 2, *Refining Stories that We Use to Explain*, third paragraph

Changed “the web of knowledge that we use to live” to “our stocks of knowledge in use” in the second sentence.

## Chapter 2, *Refining Stories that We Use to Explain*, sixth paragraph, footnote

Added the sentences:

“This rule for refining teleonomic theories weeds out (1) sociobiology, which ignores our minds and spirits; (2) postmodernist philosophy, which ignores our bodies and spirits; and (3) all spiritual philosophies that ignore our bodies and minds.”

## Chapter 4, Turbulence, third paragraph, last sentence

Added the phrase: “workers who lose their jobs during slow times because labor contracts do not let wages fall.”

## Chapter 4, A Crude Look at the Whole, second paragraph

Changed “uneven flow” to “turbulence” in the first sentence.

Changed “uneven flow” to “poor decision-making” in the second sentence.

## Appendix E, second paragraph, last sentence

“The harmony of these two tendencies is a Siren song.”

was changed to:

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“When these two tendencies unite, they lead us ever further away from our ideal paths toward living good lives. The further we are from our ideal paths, the greater is our potential for catastrophe.”

### Appendix E, last paragraph

“We owe it to ourselves to base the stories that we use to guide our actions on reality. Reality includes the inexhaustibility of knowledge and our **spiritual** need to revere life. Including these **two** timeless elements in our models of **how to live** makes our models open-ended. **Ignoring** these **two** timeless elements greatly increases our risk of suffering environmental disasters, patriotic wars, religious strife, and other catastrophes. We can be wise or we can be certain. We cannot be both wise and certain.”

was changed to:

“To reduce our potential for catastrophe, we need to base the stories that we use to guide our actions on reality. Reality includes **timeless elements**. **Chief among these are** the inexhaustibility of knowledge and our **insatiable** need to revere life. Including these timeless elements in our models makes our models open-ended. **Excluding** these elements greatly increases our risk of suffering environmental disasters, patriotic wars, religious strife, and other catastrophes. We can **aspire to be wise by including these elements** or we can **pretend to be certain by excluding them**. We cannot be both wise and certain.”

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### Changes in Version 2006.09.15

#### Acknowledgments, sixth paragraph

Changed “a business forms manufacturing company that had **returned** over thirty percent **per year on equity for more than a dozen years**” to “a **closely held** business forms manufacturing company that **for the preceding dozen years had average annual sales growth and return on equity rates of** over thirty percent” in the first sentence.

#### Chapter 2, Economic Science, last paragraph, footnote

Added the sentence “**Acting on our beliefs about the world changes the world.**”

#### Chapter 2, *Refining Stories that We Use to Explain*, second paragraph

Changed “We” to “**In short, we**” in the last sentence.

#### Chapter 2, *Refining Stories that We Use to Explain*, sixth paragraph, footnote

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Changed “postmodernist philosophy” to “postmodern moral relativism” in the last sentence.

### Chapter 4, title quote

Changed quote:

“Big whorls have little whorls,  
Which feed on their velocity,  
And little whorls have lesser whorls,  
And so on to viscosity.

— *Lewis F. Richardson*”

“<sup>1</sup> Richardson, Lewis F., *Weather Prediction by Numerical Processes*, (London: Cambridge University Press, 1922).”

to:

“The way that can be told is not the eternal way.” — *Lao Tzu*”

“<sup>1</sup> *Tao Te Ching*, Trans by John R. Leebrick (1980), chap 1, line 1, reprinted in Lao Tzu: *Tao Te Ching* (100+ Translations of Chapter 1), <<http://www.bopsecrets.org/gateway/passages/tao-te-ching.htm>> (15 September 2006).”

### Chapter 4, The Timeless Ideal, first paragraph

“Modern economics aims at the temporal ideal of a state of the world in which none of us may be made better off without making at least one of us worse off. We progress toward this ideal by acting efficiently. In contrast, the research program of, for, and by intelligent life aims at the timeless ideal of the best of all possible futures for the whole of life. We progress toward this ideal by deciding ever more wisely.”

was changed to:

“The research program of, by, and for intelligent life aims at the timeless ideal of the best of all possible futures for the whole of life. We progress toward this ideal by deciding ever more wisely.

“Deciding more wisely is a matter of converting new information into new applications of knowledge in our quest to live wisely. Each new application of knowledge creates the need to change other parts of the economy. In short, progress creates stress.

“The wise react to stress by adapting to their new circumstances in two ways. First, they try to find a better problem to solve, which is to say that they try to become more

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effective. Finding a new problem to solve usually increases the stress that they pass on to others. Second, they relieve stress by acting efficiently. Acting efficiently lessens the stress that they pass on to others.<sup>2</sup>

“If all of us were to act efficiently but not more effectively, the original shock of progress would flow through the economy as a ripple of change. In time, this ripple of change would die out as we would replace all stress with knowledge of how to act efficiently. Assuming that there is no additional shock to the economy, we would achieve a state of the world in which none of us can be made better off without making at least one of us worse off. To modern economists, this is the ideal state of general equilibrium.

“As hard as it is for many modern economists to grasp, the path toward the temporal ideal of general equilibrium is not the path toward the timeless ideal of the best of all possible futures for the whole of life. To achieve the temporal ideal, we need to act efficiently. To achieve the timeless ideal, we need to decide wisely. As we saw in the EOQ/RTS example, acting efficiently is not the same as deciding wisely.”

“<sup>3</sup> In time, unrelieved stress, like snow building up behind a snow fence, will eventually overwhelm the forces that hold it back and so release a catastrophic avalanche of change. A good example of this is the fall of the Soviet Union.”

### Chapter 4, Transient Inflation

“Deciding more wisely is a matter of converting new information into new applications of knowledge in our quest to live wisely. This process is neither costless nor instantaneous. In the short run, it is inflationary in that it uses resources that would otherwise go towards producing things that we currently want. In the long run, it deflationary in that the inexhaustible new knowledge in use provides us with more of the things that we will want. *Progress creates a “bow wave” of inflation.*

“Poor decision-making wastes resources, thereby worsening bow waves of inflation. Imagine that a small biotech company invents a cheap method of producing ethanol from crop waste. If the current producers of ethanol buy this method, they will adopt existing production capacity to the new method. The cost of putting the new method into use will be relatively small. On the other hand, if the current firms choose not to buy this method, other firms will enter the ethanol business by investing in new capacity. The cost of putting the new method into use will be much larger. Hence, the bow wave of inflation will be much larger.

“In freely evolving economies, we test methods of deciding wisely. We adopt the best and discard the worst. We become ever better at deciding wisely.”

was deleted.

### Chapter 4, Turbulence, title

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Changed title to “Deciding Wisely.”

## Chapter 4, Deciding Wisely

“Again, deciding more wisely is a matter of converting new information into new applications of knowledge in our quest to live wisely. Each new application of knowledge creates a ripple of change that flows through the economy. These ripples interact with one another in unpredictable ways. For example, the simultaneous rise in the price of steel and fall in the price of plastic is likely to cause a more rapid substitution of plastic for steel than if the price of steel rises a month after the price of plastic falls. *Progress creates turbulence in the flow of economic resources.*”

“Poor decision-making worsens turbulence. If we take a new job across the country, find that it does not satisfy our needs, and then return to our old job, we create ripples of change that flow through the economy. If we respond to a rise in the price of steel by replacing it with plastic, find that plastic does not work as well, and return to steel, we add to the ripples of change.

“We can recapture some of the waste created by poor decision-making by smoothing uneven flow. Capturing the benefit of smoothing flow may call for trading with those hurt by uneven flow. Mistrust and/or ignorance of better means of trade may constrain us from smoothing flow. Examples of this include (1) distributors who fail to share information about their customers with their suppliers for fear of losing business; (2) workers who fail to tell their bosses about foolish procedures for fear of losing work; (3) people who fail to discover their genetic predispositions for fear of losing their insurance coverage; and (4) workers who lose their jobs during slow times because labor contracts do not let wages fall.

“In freely evolving economies, we test methods of smoothing flow. We adopt the best and discard the worst. We become ever better at smoothing flow.<sup>2</sup>”

<sup>2</sup> For more on the subject of smoothing flow, see Appendix D.”

was changed to:

“Deciding wisely is an ideal that we almost never achieve. It calls on us to choose our temporal end wisely and then choose the means to this end wisely. In other words, it calls on us to find the best problem to solve and then to solve this problem using the least costly resources.

“As with other activities, we can improve our ability to decide wisely by understanding our failures. There are many ways to seek this knowledge. We can look for what we did or did not do. Did we waste resources, fail to find the best problem to solve, or fail to solve the problem? We can look for the factors of wise decision-making that we lacked. Did we lack practical wisdom, liberty, trust, or capital? We can also look for common patterns in our failures. For example, we can look for



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failures that concern trading and failures that concern the complex dynamic between the stories that we use to guide our actions and reality. We can even simulate deciding wisely on computers.

### “*Trading Failures*

The uneven flow of resources wastes time and other resources.<sup>3</sup> Capturing the benefit of smoothing flow may call for trading with those hurt by uneven flow. Mistrust and/or ignorance of better means of trade may constrain us from smoothing flow. Examples of such failures include (1) distributors who fail to share information about their customers with their suppliers for fear of losing business; (2) workers who fail to tell their bosses about foolish procedures for fear of losing work; (3) people who fail to discover their genetic predispositions for fear of losing their insurance coverage; and (4) workers who lose their jobs during slow times because labor contracts do not let wages fall. In time, we will learn to solve the trade problems that give rise to these decision failures.”

<sup>3</sup> For more on the subject of smoothing flow, see Appendix D.”

### Chapter 4, Computer Models, title

Changed title to “*Computer Models*.”

### Chapter 4, *Computer Models*, first paragraph, first footnote

<sup>3</sup> See Appendix E.”

was changed to:

<sup>4</sup> Agent based computer simulations of the imperfect flow of resources should explain what modern economists call Kondratieff waves, business cycles, and asymmetrical information market failures. Regrettably, these high level models of the imperfect flow of economic resources take imperfect decision-making as a given and so tend to blind us to the most effective problem to solve, which is how best to improve the quality of decision-making. *From the timeless view, the cause of imperfect flow is imperfect decision-making, not imperfect markets.*”

### Chapter 4, *Computer Models*, first paragraph

Changed “progress” to “deciding wisely” in the first sentence.

Deleted the last sentence, “We are far from being able to do so.”

### Chapter 4, *Computer Models*, second paragraph

Changed “progress and imperfect flow” to “deciding wisely” in the first sentence.

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## Chapter 4, A Crude Look at the Whole, first paragraph

Changed “turbulence in the flow of economic resources” to “stress” in the first sentence.

Changed “turbulence” to “stress” in the second sentence.

Changed “Turbulence” to “Stress” in the third sentence.

## Chapter 4, A Crude Look at the Whole, second paragraph, second and third sentences

“It focuses on the causes of uneven flow, progress and poor decision-making, rather than on the symptoms of poor decision-making, transient inflation and turbulence. When policies meant to treat these symptoms lower the quality of decision-making, they retard progress.”

was changed to:

“It focuses on progress and poor decision-making rather than on the effects of progress and poor decision-making, unemployment and inflation. When policies meant to treat these effects lower the quality of decision-making, they retard progress.”

## Chapter 4, Computer Models, title

Changed title to “Computer Models of Progress.”

## Chapter 5, Provide Moral Vision

Changed title to “Promote Practical Wisdom.”

Moved this subsection to the end of the Liberty section.

## Chapter 5, Promote Practical Wisdom

“A moral vision is more than a set of moral values; it is a strategy for living wisely. If this vision of what we owe it to ourselves to do is too specific, it will blind us to better means of living wisely. If it is too general, it will not help us to find better means of living wisely.

“A moral vision is especially useful in wealthy economies, where the problems people face are more problems of ignorance than of material scarcity. The wiser we live, the harder it is to know what we need to live more wisely. Further, the wiser we all live, the faster things change. The faster things change, the harder it is to know how best to live wisely.”

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was changed to:

“Practical wisdom is knowledge of how to decide wisely. Practical Wisdom is especially useful in wealthy economies, where the problems people face are more problems of ignorance than of material scarcity. The wiser we live, the harder it is to know what we need to live more wisely. Further, the wiser we all live, the faster things change. The faster things change, the harder it is to know how best to live wisely.

“Governments ought to promote practical wisdom by promoting the research program of, by, and for intelligent life.”

### Chapter 5, *Judge Interventions*, second paragraph

Changed “Two” to “Three” in the first sentence.

Added the following:

“Third, foolish interventions create adverse results, which in turn create the need for greater intervention.<sup>4</sup> Controlling the price of rental housing inevitably leads to controlling the behavior of landlords, who no longer find supplying rental housing at prior levels of quality to be wise.”

<sup>4</sup> Hayek, F. A., *The Road to Serfdom*, (Chicago, University of Chicago Press, 1944).”

### Chapter 5, *Control the Money Supply Passively*, first paragraph

Changed “distorts prices the least, hence the one that is least harmful to learning how to live wisely,” to “is least harmful to learning how to live wisely” in the fifth sentence.

Changed “create uneven flow” to “disrupt the smooth flow of resources” in the sixth sentence.

### Chapter 5, *Lower Trade Barriers*, first paragraph, first footnote

Changed “A good example of a barrier to trade is” to “Consider” in the first sentence.

Changed “insurance” to “medical insurance” in the first, second, and third sentences.

Changed “live” to “to live” in the third and fourth sentences.

### Chapter 5, *Lower Trade Barriers*, first paragraph

Changed “than” to “than is” in the last sentence.

### Afterword, third paragraph

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Changed “**turbulence**” to “**stress**” in the first sentence.

Changed “protect its people” to “protect its people **from stress**” in the second sentence.

### Appendix E

Changed “**revere life**” to “**mystically link or relink with something greater than ourselves**” in the first sentence.

Italicized the last sentence of the last paragraph.

Moved the entire appendix to a new *Recursive Failures* subsection in Chapter 4.

### All reference note URL links

Checked and updated all URL links in references.

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## Changes in Version 2006.09.21

### Chapter 2, Science as a Process, last paragraph, last footnote

Changed “science and religion” to “**timeless** science and religion” in the last sentence.

### Chapter 2, *Refining Stories that We Use to Explain*, second paragraph

Changed “**We**” to “**In short, we**” in the last sentence.

### Chapter 2, *Refining Stories that We Use to Explain*, fourth paragraph

Changed “**faster**” to “**much more readily**” in the last sentence.

### Chapter 3, *Practical Wisdom*, third paragraph

Changed “**incontinence**” to “**the loss of our ability to contain our emotions or appetites**” in the last sentence.

### Chapter 4, *Recursive Failures*, first paragraph

Changed “complex (**reflexive / recursive**) dynamic between the stories” to “complex dynamic between the stories (**narratives, models, theories, etc.**)” in the first sentence.

Added the following footnote at the end of the paragraph:

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“<sup>4</sup> Most intellectuals prefer ‘reflexive’ to ‘recursive’ to describe this complex dynamic. Arguably, this is because they see their role in the grand division of labor as seeking the truth for its own sake rather than seeking the truth that we need to progress. We see this in the distinction between philosopher of science Thomas Kuhn’s original concept of a paradigm shift as a change in the way that we conceive of the world and the resulting popular concept of a paradigm shift as a change in the way that we see the world that changes the world for the better. ‘Reflexive’ describes our mental hall of mirrors. ‘Recursive’ describes the process of making our way through this hall of mirrors.”

## Chapter 6, last paragraph

Changed “research program of, by, and for intelligent life” to “universal research program” in the last sentence.

## Appendix B, *Secular Humanism*, last paragraph

Changed “the quest” to “seeking” and “the quest for truth” to “seeking the whole truth” in the second sentence.

Changed “Wisely conceived,” to “In other words, timeless” and “science” to “timeless science” in the last sentence.

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## Changes in Version 2006.09.25

### Acknowledgments, ninth paragraph

Added the sentence:

“The science of practical wisdom is the road to living wisely.”

### Chapter 1, A Timeless Model for Living Wisely, first paragraph, footnote

Changed “Formally” to “Ideally” in the second sentence.

Added the sentence:

“Practically, we balance the costs and benefits of decision-making.”

### Chapter 2, A Timeless Model for Living Wisely, first paragraph, footnote

Changed “Formally” to “Ideally” in the second sentence.

Added the sentence:

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“Practically, we balance the costs and benefits of decision-making.”

## Chapter 2, *Moral Science*, first paragraph

Changed “timeless stories” to “stories” in the first sentence.

## Chapter 4, The Timeless Ideal, second paragraph, footnote

Deleted “eventually” from the first sentence.

Moved footnote to the end of the third paragraph.

## Chapter 4, The Timeless Ideal, third paragraph, first sentence

“The wise react to stress by adapting to their new circumstances in two ways.”

was changed to:

“The wise adapt to stress by deciding wisely.”

## Chapter 4, The Timeless Ideal, fourth paragraph

“If all of us were to act efficiently but not more effectively, the original shock of progress would flow through the economy as a ripple of change. In time, this ripple of change would die out as we would replace all stress with knowledge of how to act efficiently. Assuming that there is no additional shock to the economy, we would achieve a state of the world in which none of us can be made better off without making at least one of us worse off. To modern economists, this is the ideal state of general equilibrium.”

was changed to:

“In contrast, modern economics would have us adapt to stress by acting efficiently. Ripples of stress caused by shocks of progress would die out as we replace stress with knowledge of how to act efficiently. The system would tend toward a state of the world in which none of us can be made better off without making at least one of us worse off. This is the ideal state of general equilibrium.”

## Chapter 4, *Trading Failures*, first paragraph, footnote

Moved the footnote from the end of the first sentence to the end of the paragraph.

## Afterword, first paragraph

Changed “seven” to “eight” in the first sentence.

**Changes in Version 2006.09.30**

**Acknowledgments, second paragraph**

Changed “**would**” to “**should**” in the first sentence.

**Acknowledgments, ninth paragraph**

Deleted “**Although I finished my first draft before reading any of his works,**” from the second sentence.

**Acknowledgments, last paragraph**

Changed “**would**” to “**should**” in the first sentence.

Changed “also **would**” to “**should** also” in the second sentence.

**Chapter 1, Excellence in Living, fourth paragraph**

Changed “*living wisely*” to “*living*” in the first sentence (2 occurrences).

Changed “live **wisely**” to “live” in the last sentence.

**Chapter 1, Excellence in Living, last paragraph**

Changed “*currently have in solving temporal problems*” to “*have in solving current problems*” in the fourth sentence.

**Chapter 2, Science as a Process, last paragraph, first footnote, last sentence**

“**For more on the relationship between timeless science and religion, see Appendix B.**”

was deleted.

**Chapter 2, Economic Science, first paragraph**

Changed “**possess**” to “**use**” in the second and third sentences.

Changed “**would**” to “**should**” in the fourth sentence.

**Chapter 2, Economic Science, second paragraph**

Changed “**would**” to “**should**” in the first sentence.

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Changed “ought to” to “should” in the last sentence.

### Chapter 2, *Refining Stories that We Use to Explain*, fourth paragraph

Changed “concept” to “concept of wealth” in the fourth sentence.

Changed “concept” to “concept of wealth” in the fifth sentence.

### Chapter 2, *Refining Stories that We Use to Explain*, fifth paragraph, last footnote

Changed “the case” to “true” in the fourth sentence.

### Chapter 2, *Refining Stories that We Use to Explain*, seventh paragraph

Changed “would” to “should” in the second and third sentences.

Added the footnote:

“Rawls uses a first person conditional statement to determine moral obligation. The grammatically correct term for expressing a first person conditional statement is ‘should.’ To American ears, ‘should’ implies a moral obligation rather than a hypothetical circumstance. Americans may choose to replace the grammatically correct ‘should’ with the idiomatic ‘would.’”

Changed:

“Under these conditions, we would want intelligent beings to live ever more wisely. We should also want them to devote themselves to devote themselves to helping others to live good lives. In short, we would want intelligent life to revere life.”

to:

“Under these conditions, we should want intelligent beings to live ever more wisely and to devote themselves to helping others to live good lives. In short, we should want intelligent life to revere life.”

### Chapter 3, *Consumption*, first paragraph

Changed “foolish, as would be the case if the winner were an addict who would use the money to pursue his or her self-destructive habit” to “heading down a dark path” in the second sentence.

### Chapter 4, title quotation and quotation reference

““The way that can be told is not the eternal way.” - Lao Tzu”



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“*Tao Te Ching*, Trans by John R. Leebrick (1980), chap 1, line 1, reprinted in Lao Tzu: *Tao Te Ching* (100+ Translations of Chapter 1), <<http://www.bopsecrets.org/gateway/passages/tao-te-ching.htm>> (15 September 2006).”

were changed to:

““The way **forward** that can be told is not the **timeless** way.”- *Lao Tzu*”

“Lǎozǐ, *Dàodéjīng*, first line. Compare this interpretation by the author to the Lionel Giles translation (*The Sayings of Lao Tzu*, E. P. Dutton & Company, New York, 1905), “The Tao which can be expressed in words is not the eternal Tao;” the Arthur Whaley translation (*The Way and Its Power: A Study of the Tao Te Ching and its Place in Chinese Thought*, Allen & Unwin, London, 1934), “The Way that can be told is not the unvarying Way;” and the D. C. Lau translation (*Tao Te Ching*, Penguin Books, England, 1963), “The way that can be spoken of is not the constant way.””

### Chapter 5, Liberty, first paragraph

Changed “**communicate**” to “**express**” in the first and third sentences.

Changed “**choose**” to “**decide what to do**” in the second sentence.

Moved footnote from third sentence to second sentence.

Moved last sentence into a new paragraph.

### Chapter 6, first paragraph

Changed “**wisdom**” to “**change**” in the last sentence.

### Afterword, fourth paragraph

Changed “**claimed**” to “**declared**” in the second sentence.

Changed “**claim**” to “**declare**” in the third and fourth sentences.

### Appendix A, A Learning Worldview, second paragraph

Changed “**viewpoint**” to “**point of view**” in the third sentence.

### Appendix B, Schweitzer’s Universal Spiritual Need, second paragraph

Changed “, **while**” to “;” in the last sentence.

### Appendix D, Folding in Processes, tenth paragraph

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Changed “Compared **to**” to “Compared **with**” in the second sentence.

### Appendix D, *Smoothing Flow*, fourth paragraph

Changed “**fix**” to “**correct**” in all (2 occurrences).

### Appendix D, Machine Tools, first paragraph

Changed “Compared **to** Western **firms**” to “Compared **with** Western **plants**” in the sixth sentence.

Changed “**types**” to “**tools**” in the seventh sentence.

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## Changes in Version 2006.10.09

### Acknowledgments, eleventh paragraph

Deleted “**The science of practical wisdom is the road to living wisely.**”

### Appendix A

Changed title from “**The Toyota System**” to “**A Learning Worldview.**”

Moved **Overview** paragraphs to the **Economic Science’s Blind Spot** section of the first chapter.

Deleted the “**Overview**” and “**A Learning Worldview**” section titles.

Changed “**rapidly**” to “**quickly**” in the second sentence of the last paragraph.

### Chapter 1, Economic Science’s Blind Spot, fourth paragraph

Changed “**RTS** model **is** disturbing for those” to “**simple** model disturbs **people**” in the second sentence.

Changed “the knowledge **will be used**” to “**we will use** the knowledge” in the second sentence.

### Chapter 1, Economic Science’s Blind Spot, new sixth paragraph

Added the sentence: “**We cannot judge the full value of RTS without understanding the part it played in Toyota’s history.**”

Changed “Taiichi” to “**Production supervisor** Taiichi” in the second sentence.

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## Chapter 1, Economic Science's Blind Spot, new eighth paragraph

Changed “timeless model” to “strategy for learning” in the first sentence.

Changed “system” to “production control system” in the second sentence.

## Chapter 1, Economic Science's Blind Spot, last paragraph

Changed “about learning-by-doing” to “about the great value of learning-by-doing” in the first sentence.

## Chapter 4, Progress

Moved all sections to Economic Science section of chapter 2. (Demoted all headings by one.)

Moved chapter 5 to chapter 4.

## Chapter 2, Deciding Wisely, last paragraph

Changed “calls on” to “calls for” in the first and second sentences.

## Chapter 2, A Crude Look at the Whole, last paragraph

“We owe it to ourselves to learn to live more wisely. We owe it to ourselves to learn to thrive in winds and survive in gales of creative destruction.”

was moved to the end of the Profits section in the third chapter and changed to:

“We owe it to ourselves to learn to thrive in winds and survive in gales of creative destruction.”

## Chapter 2, *Moral Science*

Deleted the subsection. (All material used in last paragraph of the Looking Forward section of chapter 2. See below.)

## Chapter 2, end

Added the following:

### “Looking Forward

In 1776, Adam Smith's example of a pin factory showed the wisdom of pursuing the virtuous circle of the division of labor and the expansion of market size.<sup>23</sup> Four years later, a retired printer shared his thoughts on the future of science with a preacher friend:

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“The rapid Progress *true* science now makes occasions my regretting sometimes that I was born so soon. It is impossible to imagine the Height to which may be carried, in a thousand years, the Power of Man over Matter. We may perhaps learn to deprive large Masses of their Gravity and give them absolute Levity, for the sake of easy Transport. Agriculture may diminish its labor and double its Produce; all Diseases may be by sure means prevented or cured, not excepting even that of Old Age, and our Lives lengthened at pleasure even beyond the antediluvian Standard. O that moral Science were in a fair way of Improvement, that Men would cease to be Wolves to one another, and that human beings would at length learn what they now improperly call Humanity!”<sup>24</sup>

“Thus, in the midst of a world war, did Benjamin Franklin share his plea for moral science with his fellow amateur scientist, Joseph Priestley. Regrettably, Franklin’s plea went against Smith’s logic, which calls on us to please ourselves, not to live wisely.

“Today, Toyota’s strategy for learning how to produce ever more wisely shows the wisdom of pursuing the virtuous circle of good people and good products. Good people produce good products. Good products, *including good intellectual tools*, produce good people. Given this new logic, we ought to learn more about good people and good products. To do so, we need to define the whole of science to be the process of refining everyday thinking. We also need to define economic science in a way that includes both the stories that we use to predict and the stories that we use to explain how to live wisely. We can do so by defining it to be the scientific study of the research program of, by, and for intelligent life. We can define it to be the premier *intelligent life science*.”

“<sup>23</sup> Smith, Adam, *An Inquiry into the Nature and Causes of the Wealth of Nations*, book 1, chap 1.”

“<sup>24</sup> Franklin, Benjamin, *The Writings of Benjamin Franklin*, edited by Albert Henry Smyth, (New York: Macmillan, 1905), vol. VIII, p 10.”

### Chapter 6, Closing Thoughts

Deleted the chapter. (All material used in the first three paragraphs of the Looking Forward section of chapter 2. See above.)

### Appendix D, Temporal Details, first paragraph, footnote, last sentence

“Taiichi Ohno **spoke to** both **groups**.”

was changed to:

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“Both events focused on material found in the *Cambridge Corporation Report #1, TQC and Quality Circles*, (Tokyo: The Cambridge Corporation, 1982). Taiichi Ohno gave keynote addresses at both events. The author refreshed his memory with Masaaki Imai’s *Kaizen* (New York: Random House, 1986); the English translation of Taiichi Ohno’s *Toyota Production System* (Cambridge, Massachusetts: Productivity Press, 1988); and the revised edition of the Japan Management Association’s *Kanban, Just in Time at Toyota* (Cambridge, Massachusetts: Productivity Press, 1989).”

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## Changes in Version 2006.10.12

### Preface, first paragraph

Changed “course” to “**pioneering** work” in the second sentence.

### Chapter 1, Setting Words Aright, second paragraph

Changed “**knowledge resources**” to “**they**” in the third sentence.

Changed “**a pattern**” to “**knowledge**” in the last sentence.

### Chapter 1, Economic Science's Blind Spot, ninth paragraph

Changed “**system**” to “**strategy for learning**” in the last sentence.

Added the sentence: “**RTS is a key part of this strategy.**”

### Chapter 1, Excellence in Living Wisely, last paragraph, second and third sentences

“We do so by **distinguishing between** timeless **and temporal tools** (concepts, models, etc.). **Timeless tools** help us to identify what we are likely to need in our quest to live wisely. **Temporal tools** help us to make the most of what we have in solving current problems.”

was changed to:

“We do so by **using** timeless tools (concepts, models, etc.) **to** help us to identify what we are likely to need in our quest to live wisely **and** temporal tools **to** help us to make the most of what we have.”

### Chapter 1, Excellence in Living Wisely, last paragraph, footnote

“**In military terms, timeless tools are strategic and temporal tools are tactical. We owe it to ourselves to plan our lives using strategic tools and work our plans using tactical ones.**”

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was promoted to body text.

## Chapter 1, A Timeless Model for Living Wisely, last paragraph

Changed “**liberty**” to “**freedom**” in the sixth and last sentences.

## Chapter 2, *Refining Stories that We Use to Explain*, sixth paragraph, footnote

Changed “**teleonomic** theories” to “theories **about our needs**” in the fourth sentence.

Deleted “**for weeding out teleonomic theories**” from sixth sentence.

## Chapter 2, *The Timeless Ideal*, third paragraph

Changed “they try to find a better problem to solve, **which is to say that they try to become more effective**” to “they try to become more effective” in the second sentence.

## Chapter 2, *Deciding Wisely*, last paragraph

Changed “**liberty**, trust, **or** capital” to “**freedom**, trust, capital, **or** time” in the sixth sentence.

## Chapter 2, Trading Failures, first paragraph, footnote

Changed “Appendix **D**” to “Appendix **C**.”

## Chapter 2, Looking Forward, first paragraph, end

Added the sentence:

“**Perfection of means and confusion of ends characterized the age.**”

## Chapter 2, Looking Forward, last paragraph

Changed “strategy for learning **how to produce ever more wisely**” to “strategy for learning” in the first sentence.

## Chapter 3, Wealth, first paragraph

“**Modern economists define wealth to be the consumer goods and services and the resources to produce the consumer goods and services that we want. In contrast, the wise define wealth to be the resources that we need to live wisely.**”<sup>2</sup>

<sup>2</sup> This **teleonomic** definition of wealth is not compatible with the current national income accounting scheme. See Appendix **C**.”

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was changed to:

“Wealth is what we need to achieve our ends. Temporal wealth is what we need to get what we want. Timeless wealth is what we need to live wisely.<sup>2</sup> Timeless wealth includes practical wisdom, trust, freedom, capital, and time.”

<sup>2</sup> This **timeless** definition of wealth is not compatible with the current national income accounting scheme. See Appendix **D**.”

### Chapter 3, *Human Capital, Work, and Leisure*, first paragraph

Changed “temporal view,” to “temporal view **of modern economics**,” in the first sentence.

Changed “income **potential**” to “income” in the first sentence.

### Afterword, first paragraph

Changed ““**liberal**” or “**conservative**”” to ““**conservative**” or “**liberal**”” in the last sentence.

### Afterword, third paragraph

Changed “believe” to “**also** believe” in the first sentence.

Changed “**owe it to themselves**” to “**ought**” in the first sentence.

Changed “**People**” to “**Those**” in the last sentence.

### Afterword, fourth paragraph

Changed “**also** believe” to “believe” in the first sentence.

Changed “**owe it to themselves**” to “**ought**” in the first sentence.

Changed “**People**” to “**Those**” in the last sentence.

Moved paragraph to behind the second paragraph.

### Afterword, fifth paragraph

“I see the current culture war as a religious war, a war over civil religion. I am for replacing civil religion, especially the gospels of nationalist James G. Blaine and socialist John Dewey, with the research program of, by, and for intelligent life. We ought to consecrate the search for knowledge of how to live wisely, not our tribe. We ought to be on the side of our better angels.”

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was deleted.

## Appendix C & D

Switched order of these appendices in order to match the order of their appearance in the book.

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## Changes in Version 2006.10.16

### Acknowledgments, last paragraph, first sentence

“I should like to thank Daniel Brophy, John Swanson, Patrika Vaughn, Lucile Harris, and James Rogers Fox for their unwavering enthusiasm and countless critiques.”

was deleted.

### Chapter 1, Excellence in Living, first paragraph, last two sentences

“Consuming cocaine efficiently is “rational.” Not consuming cocaine is wise.”

was changed to:

“Choosing an analog television standard in 1991 was “rational.” Choosing a digital standard was wise.”

### Chapter 2, The Timeless Ideal, third paragraph, footnote

Changed “fall” to “collapse” in the last sentence.

### Chapter 2, Deciding Wisely, last paragraph

Changed “and” to “or” in the seventh sentence.

### Chapter 2, Looking Forward, last paragraph

Changed “scientific study” to “study of the management” in the seventh sentence.

### Appendix D, second paragraph, second sentence

“Most modern economists recognize problems in measuring services and improvements in quality.”

was changed to:



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“Most modern economists recognize problems in measuring **the value of** services and **changes in product** quality.”

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### Changes in Version 2006.12.04

#### Chapter 2, Science as a Process, last paragraph, first footnote

“Most scientists believe that they seek the truth per se rather than useful assays of the truth. In as much as their pursuit of the truth satisfies their need to be part of something greater than themselves, their pursuit of the truth is a religious quest. To true believers in the current concept of science, this timeless concept is heretical.”

was deleted.

#### Chapter 2, Science as a Process, last paragraph, second footnote

Changed “**be a theory** (the result of a **process** of refining everyday thinking)” to “concern the results of refining everyday thinking (**theories**)” in the first sentence.

Changed “**a strategy for learning** (a process for refining everyday thinking)” to “**processes** for refining everyday thinking (**strategies for learning**)” in the first sentence.

#### Chapter 2, Looking Forward, second paragraph

Changed “**world war**” to “war **that spread from North America to the Indian subcontinent**” in the first sentence.

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### Changes in Version 2006.12.30

#### Acknowledgments, tenth paragraph

Changed “**Grinnell High School American history and German language students, including Harry Hopkins**” to “**three sons**” in the third sentence.

#### Chapter 2, title

Changed “Science” to “**Economic Science**.”

#### Chapter 2, Science as A Process, first paragraph

Changed “(to act or not to act)” to “to act or not to act” in the first sentence.

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## Chapter 2, Science as A Process

Merged this section into the first section, Refining Everyday Thinking.

## Chapter 2, Economic Science, title

Changed “Economic **Science**” to “Economics.”

## Chapter 2, Refining Stories subsections

Combined “**Refining Stories that We Use to Predict**” and “**Refining Stories that We Use to Explain**” into a single subsection title “**Refining Economic Stories.**”

## Chapter 2, Refining Economic Stories, first paragraph

“We owe it to ourselves to refine the set of stories that we use to predict what will happen in economies by weeding out all stories that are not clear, concise, and logical. What will remain is a set of precise stories that we use to predict what will happen in economies. We **owe it to ourselves** to refine this set by weeding out stories that fail to meet our (evolving) standards for helping us to predict what will happen in economies. What will remain is a set of refined stories that we use to predict what will happen in economies.”

was changed to:

“We owe it to ourselves to refine the set of stories that we use to predict what will happen in economies. **We may begin to refine these stories** by weeding out all stories that are not clear, concise, and logical. What will remain is a set of precise stories that we use to predict what will happen in economies. We **may then** refine this set by weeding out stories that fail to meet our (evolving) standards for helping us to predict what will happen in economies. What will remain is a set of refined stories that we use to predict what will happen in economies.”

## Chapter 2, Refining Stories, second paragraph

“We owe it to ourselves to refine the set of stories that we use to explain what happens in economies by weeding out all stories that are not clear, concise, and logical. What should remain is a set of precise stories that we use to explain what happens in economies. We **owe it to ourselves** to refine this set by weeding out stories that fail to meet our (evolving) standards for helping us to find problems to solve. What should remain is a set of refined stories that we use to find problems to solve. *The rub is that we do not know exactly what it is that we owe to ourselves to seek.*”

was changed to:

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“We also owe it to ourselves to refine the set of stories that we use to explain what happens in economies. **We may begin** by weeding out all stories that are not clear, concise, and logical. What should remain is a set of precise stories that we use to explain what happens in economies. We **may then** refine this set by weeding out stories that fail to meet our (evolving) standards for helping us to find problems to solve. What should remain is a set of refined stories that we use to find problems to solve. *The rub is that we do not know exactly what it is that we owe to ourselves to seek.*”

### Chapter 2, Refining Stories, seventh paragraph, footnote

Changed “spiritual **philosophies**” to “spiritual **teachings**” in the last sentence.

### Chapter 2, Deciding Wisely, last paragraph

Changed “deciding **wisely on computers**” to “**decision failures**” in the last sentence.

### Chapter 2, Recursive Failures, first paragraph

Deleted “(**narratives, models, theories, etc.**)” in the first sentence.

### Chapter 2, Computer Models, first paragraph, footnote, last sentence

*“From the timeless view, the cause of imperfect flow is imperfect decision-making, not imperfect markets.”*

was deleted.

### Chapter 2, Looking Forward, title

Changed title to “**Moral Science**” and demoted it one level.

### Chapter 2, Moral Science, first paragraph

Added “**in the midst of a war that had spread from North America to the Indian subcontinent,**” to the second sentence.

Added “**turned diplomat**” to the second sentence.

### Chapter 2, Moral Science, second paragraph

Changed “Thus, **in the midst of a war that spread from North America to the Indian subcontinent,**” to “Thus” in the first sentence.

Changed “age” to “**industrial age**” in the last sentence.

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## Changes in Version 2007.02.24

### Preface, third paragraph

“I have since learned that my wish for a strategy for living based on a theory was foolish. I ought to have wished for a method of weeding out members of the set of theories that we use to explain how to live wisely. What follows is a concise guide to this method.”

was changed to:

“I have since learned that my wish for a strategy for living based on a theory was foolish. **All theories contain ignorance in the form of untestable assumptions. A wise strategy for living contains a means of testing these assumptions. Hence,** I ought to have wished for a method of weeding out members of the set of theories that we use to explain how to live wisely. What follows is a concise guide to this method.”

### Chapter 1, Modern Economics' Blind Spot, eighth paragraph

Changed “**these**” to “**kanban**” in the second sentence.

Changed “links” to “**kanban** links” in the third sentence.

Changed “system” to “**Toyota** system” in the last sentence.

### Chapter 2, Economic Science, first paragraph, first sentence

“**Nowhere is** the need for this timeless concept of science **more** pressing **than** in the field of economics.”

was changed to:

“**The** need for this timeless concept of science **is especially** pressing in the field of economics.”

### Chapter 2, The Timeless Ideal, fourth paragraph

Changed “general equilibrium” to “**Pareto optimal** general equilibrium” in the last sentence.

### Chapter 2, The Timeless Ideal, last paragraph

Changed “**As hard as it is for many modern economists to grasp, the**” to “**The**” in the first sentence.

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Changed “general equilibrium” to “**Pareto optimal** general equilibrium” in the first sentence.

### Chapter 2, Trading Failures, first paragraph

“The uneven flow of resources wastes time and other resources. Capturing the benefit of smoothing flow may call for trading with those hurt by uneven flow. Mistrust and/or ignorance of better means of trade may constrain us from smoothing flow. Examples of **such** failures include (1) distributors who fail to share information about their customers with their suppliers for fear of losing business; (2) workers who fail to tell their bosses about foolish procedures for fear of losing work; (3) **people who fail to discover their genetic predispositions for fear of losing their insurance coverage;** and (4) workers who lose their jobs during slow times because labor contracts do not let wages fall. In time, we will learn to solve the trade problems that give rise to these decision failures.”

was changed to:

“The uneven flow of resources wastes time and other resources. Capturing the benefit of smoothing flow may call for trading with those hurt by uneven flow. Mistrust and/or ignorance of better means of trade may constrain us from smoothing flow. Examples of **trading failures uncovered by comparing Western industrial age manufacturing practices to the Toyota system** include (1) distributors who fail to share information about their customers with their suppliers for fear of losing business; (2) workers who fail to tell their bosses about foolish procedures for fear of losing work; and (3) workers who lose their jobs during slow times because **their** labor contracts do not let wages fall. **Yet unsolved examples of trading failures include (1) people who fail to discover their genetic predispositions for fear of losing their health insurance coverage; (2) employees who stay in unsuitable jobs for fear of losing employee benefits, e.g., health insurance coverage or pension benefits; and (3) citizens who live under unsuitable governments for fear of losing government benefits, e.g., health insurance coverage or pension benefits.** In time, we will learn to solve the trade problems that give rise to these decision failures.”

### Chapter 2, Recursive Failures, first two paragraphs

“There is a **complex dynamic** between the stories that we use to guide our actions and reality. *We base these stories on reality. Our actions change reality.* Consider the statement, “Tulips are a good investment.” If enough people use this story to guide their actions, the price of tulips will rise enough for tulips to become a poor investment.<sup>19</sup>”

“**The dynamic relation between the stories that we use to guide our actions and reality** gives rise to a wide variety of phenomena, which range from simple speculative bubbles to complex systems of human organizations. We can think about **this dynamic** as the interplay of two tendencies of **these** stories. The first is their tendency to

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become more popular. This, in part, is due to the inexhaustibility of knowledge. The second is their tendency to undermine the conditions on which we base them. Repeatedly using these stories to guide our actions without considering how our actions change reality tends to lead us ever further away from ideal paths toward living good lives. When these two tendencies unite, they lead us ever further away from our ideal paths toward living good lives. The further we are from our ideal paths, the greater is our potential for catastrophe.”

were changed to:

“There is a **two-way relation** between the stories that we use to guide our actions and reality. We base these stories on reality. Our actions change reality. Consider the statement, “Tulips are a good investment.” If enough people use this story to guide their actions, the price of tulips will rise enough for tulips to become a poor investment. This **two-way relation** gives rise to a wide variety of phenomena, which range from simple speculative bubbles to complex systems of human organizations.<sup>19</sup>”

“We can think about the **cause of this rich variety of phenomena** as the interplay of two tendencies of the stories **that we use to guide our actions**. The first is their tendency to become more popular. This, in part, is due to the inexhaustibility of knowledge. The second is their tendency to undermine the conditions on which we base them. Repeatedly using these stories to guide our actions without considering how our actions change reality tends to lead us ever further away from ideal paths toward living good lives. When these two tendencies unite, they lead us ever further away from our ideal paths toward living good lives. The further we are from our ideal paths, the greater is our potential for catastrophe.”

### Chapter 2, Recursive Failures, last paragraph, last sentence

*“We cannot be both wise and certain.”*

was deleted.

### Chapter 3, Two Types of Tools, title

Changed title to: **“The Wise Use of Concepts.”**

### Chapter 3, The Wise Use of Concepts, first paragraph, second sentence

**“They plan their lives using timeless tools and work their plans using temporal ones.”**

were changed to:

**“The wise use timeless concepts to select temporal ends and temporal concepts to select the best means to temporal ends.”**

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### Afterword, first paragraph, last two sentences

“I have also learned that these conversations often turn to **politics. Am I** “conservative” or “liberal” in the way that people in the United States use these terms?”

were changed to:

“I have also learned that these conversations often turn to **the question of whether I am** “conservative” or “liberal” in the way that people in the United States use these terms.”

### Afterword, second paragraph, first sentence

“I oppose people who hinder **deciding** wisely.”

was merged with the first paragraph and changed to:

“**My curt answer is that** I oppose people who hinder **learning to** decide **ever more** wisely.”

### Afterword, third paragraph

Changed “**profess to guard** civil liberties” to “**promote** civil liberties” in the third sentence.

### Afterword, last paragraph

Changed “**profess to guard** civil liberties” to “**promote** civil liberties” in the third sentence.

Changed “**Justice** Oliver Wendell Holmes’s” to “Oliver Wendell Holmes’s” in the third sentence.

### Afterword, end

Added the paragraph:

“**I am neither a “conservative” nor a “liberal” in the way that people in the United States use these terms.**”

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## Changes in Version 2007.04.17

### Acknowledgments, fifth paragraph, middle three sentences

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“Charles Horngren taught me how accounting models color analysis. William Beaver showed me the wisdom of applying economic analysis to accounting models. **Charles Holloway gave me a thorough understanding of decision science.**”

was changed to:

“Charles Horngren **and Charles Holloway** taught me how accounting **and decision science** models color analysis. William Beaver showed me the wisdom of applying economic analysis to accounting models.”

### Preface, third paragraph

Changed “**wise** strategy” to “**good** strategy” in the third sentence.

The last sentence:

“**What follows is a concise guide to this method.**”

was changed to:

“**I ought to have wished for a science of practical wisdom.**”

### Preface, end

Added the paragraphs:

“For people who believe that science is definite knowledge of what is, the concept of a science of practical wisdom is nonsense. If scientists cannot define practical wisdom, which includes defining our ultimate ends, there can be no science of practical wisdom. On the other hand, if science is the pursuit of definite knowledge of what is, then the issue becomes whether it is possible to define a means of defining practical wisdom. Because it is possible to define a means of defining practical wisdom, there can be a science of practical wisdom.

“The concept of science as the pursuit of definite knowledge conflicts with the modern Western belief that science is separate and distinct from religion. Analytic philosopher Bertrand Russell clearly stated this modern belief in his definition of philosophy, which he used to introduce his popular history of Western philosophy:

“Philosophy, as I shall understand the word, is something intermediate between theology and science. Like theology, it consists of speculations on matters as to which definite knowledge has, so far, been unascertainable; but like science, it appeals to human reason rather than to authority, whether that of tradition or that of revelation. All *definite* knowledge — so I should contend — belongs to science; all *dogma* as to what surpasses definite knowledge belongs to theology. But between theology and science there is a No Man's Land, exposed to attack from both sides; this No Man's Land is philosophy.”



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“In defining philosophy, Russell was true to his vision, which calls for ceasing analysis at the border of what he calls theology. It is no accident that Russell conflates theology, religion, and faith. For people interested in pursuing definite knowledge, this is a mistake. Theology, religion, and faith, are separate and distinct concepts. Theology is the pursuit of knowledge of God. Religion is the means of linking or relinking with something greater than ourselves; it is the means of satisfying what Albert Schweitzer called our need for mystical oneness. Faith is extra-reasonable certainty in our beliefs; it is what gives us certainty in our beliefs beyond that offered by reason alone. We can imagine using these concepts not only separately from one another, but also in conflict with one another. We can imagine people pursuing knowledge of God who lack either religious zeal or faith in the existence of God . We can imagine people putting their faith in either atheistic political movements or the chance to win a week of Las Vegas debauchery. We can imagine atheists either putting their faith in the non-existence of God or pursuing the transcendent values of truth, justice, and beauty with the religious zeal. Again, theology, religion, and faith are separate and distinct concepts. We should not confuse them with theistic religious faith, that is, with the zealous and extra-reasonable pursuit of knowledge of God.

“Further, what Russell calls science can never be completely free from what he calls dogma. This is because all belief systems, including scientific ones, call on us to put our faith in assumptions that we can never test completely. We can never be completely sure that all swans are either white or black, that nothing can exceed the speed of light, or even that all bachelors are unmarried. In terms of the philosophy of science, all belief systems are underdetermined by data. To make matters worse, this problem extends to our beliefs about testing our beliefs. Judging our belief systems by determining the truth is an infinitely large problem.

“We solve infinitely large problems by finding processes that, when applied recursively (repeatedly with the output of one cycle becoming the input of the next cycle), move us ever closer to the solution. To solve the problem of determining the number pi, we find processes that, when applied recursively, move us ever closer to determining pi. To solve the infinitely large problem of judging belief systems by determining the truth, we find processes that, when applied recursively, move us ever closer to determining the truth.

“In general, we move ever closer to determining the truth by means of a recursive process that begins with finding a problem to solve and ends with learning from the experience of implementing the chosen solution to this problem. I refer to this process as decision-making. Given this expansive definition of decision-making, we move ever closer to determining the truth by deciding ever more wisely. We can decide ever more wisely by improving the factors of deciding wisely. These factors include practical wisdom, trust, liberty, and capital.

“Many modern thinkers will complain that I confuse seeking the truth (religion, philosophy, and science) with seeking the good (religion, ethics, politics, and economics). In making this claim, these people confuse the tactical problem of seeking

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the truth given what we currently know and the tactical problem of seeking the good given what we currently know with the strategic problem of seeking both the truth and the good. They confirm Albert Einstein's observation, "Perfection of means and confusion of ends seem to characterize our [modern] age."

"The essence of modernism is the process of breaking down complicated things into simpler things in order to do something better. We see this process in science (reductionism), philosophy (analysis), and economics (the division of labor). The major downside of this process of breaking down things is forgetting to consider the whole, especially how we fit into the whole. Despite the fact that definite knowledge of how we fit into the whole, like definite knowledge of pi, will likely remain forever beyond our grasp, we should not pass over it in silence.

"Most people decide based on what they know. In contrast, people who want to decide ever more wisely decide not only based on what they know but also on what they need to learn in order to decide more wisely. They embrace their ignorance. To embrace their ignorance wisely, they distinguish between the intellectual tools that they use to find problems to solve and the intellectual tools that they use to solve given problems. In military terms, they distinguish between the strategic and the tactical. In philosophical terms, they distinguish between the timeless and the temporal. In scientific terms, they distinguish between explanations and predictions. In economic terms, they distinguish between effectiveness and efficiency. They then use the right tool for the right job.

"The target audience for this book is people who are looking for tools for solving given problems. In the first chapter, I seek to convince these people that all of the problems they face in life are part of the timeless problem of deciding how best to improve the process of living. I go on to describe a strategy for improving this decision-making process. In the second chapter, I provide them with a conceptual framework - a tool kit - for following this strategy. In the third, I apply this tool kit to the problem of pursuing the truth and the good. In the last chapter, I apply this tool kit to the problem of governance.

"Enjoy."

### **Chapter 1, Setting Words Aright, last paragraph**

Changed "wisely" to "(ever more) wisely" in the last sentence.

### **Chapter 1, A Timeless Model for Living Wisely, second paragraph**

Changed "dotcom" to "dot.com" in the first sentence.

### **Chapter 2, "Economic Science"**

Moved this chapter to behind "**Timeless Concepts.**"

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### Chapter 3, tenth footnote, last sentence

“See Chapter 3 and Appendix B.” was deleted.

### Chapter 4, Justice, last paragraph

Changed “*more wisely*” to “*ever more wisely*” in the last sentence.

### Afterword, last paragraph, end

Added the sentences:

“I am a conservative idealist, by which I mean that I seek to conserve the ideals that I find in the Declaration of Independence and the Gettysburg Address. These ideals are classically liberal in means and progressive in ends.”

### Afterword, second paragraph

Added “(“a God’s eye view of the Universe”)” to the second sentence.

### Appendix B, Secular Humanism, title

Title changed to “Atheism.”

### Appendix B, Atheism, first paragraph

Deleted “(“a God’s eye view of the Universe”)” in the second sentence.

Deleted the last sentence and footnote:

“In short, timeless religion supports timeless science.<sup>13</sup>”

<sup>13</sup> The existence of a religious need for mystical oneness is compatible with both the materialist and dualist worldviews. *Rather than distinguishing between secular and religious humanism, we ought to distinguish between materialist and dualist humanism.*”

### Appendix B, Atheism, last paragraph

Changed “*Secular humanists*” to “*Atheists*” in the first sentence.

### Appendix B, “Religious Fundamentalism”, title

Title changed to “Theism.”

### Appendix B, Theism, last paragraph

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Changed “*Religious fundamentalists*” to “*Theists*” in the first sentence.

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## Changes in Version 2007.04.23

### Acknowledgments, tenth paragraph

Changed “three sons” to “Grinnell High School students, including Harry Hopkins, and into her three sons” in the third sentence.

### Chapter 1, Setting Words Aright, first two paragraphs

“Concepts are tools for thinking and communicating. We use them to refine what we mean from what we do not mean. We use the concept ‘house’ to refine what we mean by ‘house’ from what we do not mean by ‘house.’ Similarly, we use the concept ‘fast’ to refine what we mean by ‘fast’ from what we do not mean by ‘fast.’ Metaphorically, concepts are containers for meaning.

“When we use concepts wisely, they help us to achieve our ends. They are *knowledge resources*.”

were changed to:

“Concepts are tools for thinking and communicating. When we use these tools wisely, they help us to achieve our ends. Concepts are *knowledge resources*.”

### Chapter 1, Economic Science's Blind Spot, title

Changed title to “Excellence in Means.”

### Chapter 1, Excellence in Means, first paragraph

Changed “the modern economic concept” to “the modern concept” in the second sentence.

### Chapter 1, Excellence in Means, second paragraph

Changed “*The wise*” to “*People who seek to decide wisely*” in the second sentence.

### Chapter 1, Excellence in Living, second paragraph

Changed “*The wise*” to “*Accordingly, people who seek to decide wisely*” in the second sentence.

Changed “*the wise*” to “*them*” in the last sentence.

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## Chapter 2, The Wise Use of Concepts, first paragraph

Changed “The wise” to “People who seek to decide wisely” in the first sentence.

## Chapter 2, Two Means of Living Wisely, first paragraph

Changed “the wise” to “others” in the second sentence.

## Chapter 2, Alternatives to Living Wisely, first paragraph, first two sentences

“The wise pursue the virtuous circle of pleasure and joy. The major alternatives are pursuing pleasure or pursuing nothing.”

was changed to:

“The two major alternatives to pursuing the virtuous circle of pleasure and joy are pursuing pleasure and pursuing nothing.”

## Chapter 3, Economics, first paragraph, last sentence

“In other words, we need to explain based on how the wise would act.”

was deleted.

## Chapter 3, Refining Economic Stories, seventh paragraph

Changed “The wise” to “People who seek to live wisely” in the first sentence.

## Chapter 3, The Timeless Ideal, third paragraph

Changed “The wise” to “People who seek to live wisely” in the first sentence.

## Chapter 3, Trading Failures, first paragraph, fifth sentence

“Yet unsolved examples of trading failures include (1) people who fail to discover their genetic predispositions for fear of losing their health insurance coverage; (2) employees who stay in unsuitable jobs for fear of losing employee benefits, e.g., health insurance coverage or pension benefits; and (3) citizens who live under unsuitable governments for fear of losing government benefits, e.g., health insurance coverage or pension benefits.”

was changed to:

“Yet unsolved examples of trading failures include people who fail to discover their genetic predispositions for fear of losing their health insurance coverage and employees who stay in unsuitable jobs for fear of losing employee benefits.”

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Change Archive for 2006 - 2007

## Chapter 3, Moral Science

Restored title to primary (section) level.

## Chapter 3, Moral Science, second paragraph, last sentence

“Perfection of means and confusion of ends characterized the industrial age.”

was deleted.

## Chapter 3, Moral Science, last paragraph, fifth through seventh sentences

“To do so, we need to define the whole of science to be the process of refining everyday thinking. We also need to define economic science in a way that includes both the stories that we use to predict and the stories that we use to explain how to live wisely. We can do so by defining it to be the study of the management of the research program of, by, and for intelligent life. We can define it to be the premier *intelligent life science*.”

was changed to:

“To do so wisely, we need to define economic science to be the study of the pursuit of the truth and the good, which is to say the study of the research program of, by, and for intelligent life. We need to define economic science to be the premier *intelligent life science*.”

## Chapter 4, Judge Interventions, first paragraph

Changed “The wise” to “Wise policymakers” in the second sentence.

## Chapter 4, Lower Trade Barriers, last footnote

“From a Marxist view, the predominant mode of production greatly influences the culture. The logic of the industrial age holds that economies are like great machines in which people are interchangeable parts performing mindless tasks. The culture calls on people to seek pleasure. Supporting this view is the trend away from following traditions and toward seeking pleasure. We see this trend clearly in England, where the cultural ideal changed from fulfilling one’s role in God’s plan to hedonist Jeremy Bentham’s “greatest good for the greatest number.” The knowledge revolution has changed the logic of production. The new logic holds that economies are like great learning organisms in which people are the most important parts, the parts that learn. The culture calls on people to seek to live wisely. Given this new logic, lowering trade barriers promotes the predominant mode of production, which in turn promotes progress toward the timeless end of all humans living fully human lives.”

was deleted.

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## Chapter 4, Justice, last paragraph

Italics removed from the last sentence:

“The haves as well as the have-nots ought to learn to decide ever more wisely.”

## Afterword, third paragraph

Changed “promote **civil liberties**” to “**defend free speech but constrain free action in order to promote their vision of a just society**” in the third sentence.

## Afterword, last paragraph

Added “, **the Bill of Rights,**” to the second to last sentence.

## Appendix B, Heroic Death, second paragraph

Changed “**The wise**” to “**People who seek to decide wisely**” in the first sentence.

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## Changes in Version 2007.04.30

### Preface, third paragraph

Changed “**live** wisely” to “live” in the fourth sentence.

### Preface, sixth paragraph

“In defining philosophy, Russell was true to his vision, which calls for ceasing analysis at the border of what he calls theology. It is no accident that Russell **conflates theology, religion, and faith**. For people interested in pursuing definite knowledge, this is a mistake. Theology, religion, and faith, are separate and distinct concepts. Theology is the pursuit of knowledge of God. Religion is the means of linking or relinking with something greater than ourselves; it is the means of satisfying what Albert Schweitzer called our need for mystical oneness. Faith is extra-reasonable certainty in our beliefs; it is what gives us certainty in our beliefs beyond that offered by reason alone. We can imagine using these concepts **not only separately from one another, but also** in conflict with **one another**. We can imagine people pursuing knowledge of God who lack either religious zeal or faith in the existence of God . We can imagine people putting their faith in either atheistic political movements or the chance to win a week of Las Vegas debauchery. We can imagine atheists either putting their faith in the non-existence of God or pursuing the transcendent values of truth, justice, and beauty with the religious zeal. Again, theology, religion, and faith are separate and distinct concepts. **We should not confuse them with theistic religious faith, that is, with the zealous and extra-reasonable pursuit of knowledge of God.**”

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was changed to:

“Russell’s definition of philosophy is consistent with, if not based upon, the modern habit of confusing theology, religion, and faith. Theology, religion, and faith are separate and distinct concepts. They are not synonyms for the zealous and extra-reasonable pursuit of knowledge of God. Theology is the pursuit of knowledge of God. Religion is the means of linking or relinking with something greater than ourselves; it is the means of satisfying what Albert Schweitzer called our need for mystical oneness. Faith is extra-reasonable certainty in our beliefs; it is what gives us certainty in our beliefs beyond that offered by reason alone. We can imagine using these three concepts in conflict with the zealous and extra-reasonable pursuit of knowledge of God. We can imagine people pursuing knowledge of God who lack either religious zeal or faith in the existence of God. We can imagine people putting their faith in either atheistic political movements or the chance to win a week of Las Vegas debauchery. We can imagine atheists either putting their faith in the non-existence of God or pursuing the transcendent values of truth, justice, and beauty with the religious zeal. Again, theology, religion, and faith are separate and distinct concepts. They are not synonyms for the zealous and extra-reasonable pursuit of knowledge of God.”

### Preface, seventh paragraph, first sentence

“Further, what Russell calls science can never be completely free from what he calls dogma.”

was changed to:

“This confusion of theology, religion, and faith hides a fatal flaw in Russell’s belief system: what Russell calls science can never be completely free from what he calls dogma.”

### Preface, tenth paragraph

Changed “Many modern thinkers” to “Some people” in the first sentence.

Changed “They” to “I believe that they” in the last sentence.

Added the paragraph:

“To students of complexity science, there is some beauty in unpacking this argument. There was a time when lovers of wisdom distinguished between the strategic and the tactical by capitalizing the strategic. Using this bygone convention, the truth is correspondence to reality based on what we currently know; the Truth is correspondence to reality based on all that can be known. The good is what we need to live well based on what we currently know; the Good is what we need to live well based on all that can be known. We need the truth to pursue the Good. We also need



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the good to pursue the Truth. Hence, the pursuit of the Good and the pursuit of the Truth are intertwined - pursuing one calls for pursuing the other. In as much as we are born with the need to live well, we are born with the need to pursue both the Good and the Truth. To believe that we can break down the timeless pursuit of the Good and the Truth, which are intertwined, into the temporal search for the truth and the temporal search for the good is to confuse the complex with the merely complicated.”

### Preface, new twelfth paragraph

Changed “likely remain” to “remain” in the last sentence.

### Preface, new thirteenth paragraph

Changed “want to decide ever more wisely” to “pursue both the Good and the Truth” in the second sentence.

### Chapter 3, Recursive Failures, first paragraph, footnote

“Most intellectuals prefer ‘reflexive’ to ‘recursive’ to describe this complex dynamic. Arguably, this is because they see their role in the grand division of labor as seeking the truth for its own sake rather than seeking the truth that we need to progress. We see this in the distinction between philosopher of science Thomas Kuhn’s original concept of a paradigm shift as a change in the way that we conceive of the world and the resulting popular concept of a paradigm shift as a change in the way that we see the world that changes the world for the better. ‘Reflexive’ describes our mental hall of mirrors. ‘Recursive’ describes the process of making our way through this hall of mirrors.”

was changed to:

“Most intellectuals prefer ‘reflexive’ to ‘recursive’ to describe this complex dynamic. Arguably, this is because they see their role as seeking the truth rather than seeking both the truth and the good. We see this in the distinction between philosopher of science Thomas Kuhn’s concept of a paradigm shift as a change in the way that we conceive of the world and the popular concept of a paradigm shift as a change in the way that we see the world that changes the world for the better. ‘Reflexive’ describes our mental hall of mirrors. ‘Recursive’ describes the process of moving forward through this hall of mirrors.”

### Chapter 3, Recursive Failures, second paragraph

“We can think about the cause of this rich variety of phenomena as the interplay of two tendencies of the stories that we use to guide our actions. The first is their tendency to become more popular. This, in part, is due to the inexhaustibility of knowledge. The second is their tendency to undermine the conditions on which we base them. Repeatedly using these stories to guide our actions without considering

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how our actions change reality tends to lead us ever further away from **ideal paths toward living good lives**. When these two tendencies unite, they lead us ever further away from our ideal paths toward living good lives. The further we are from **our** ideal paths, the greater is our potential for catastrophe.”

was changed to:

“We can think about the cause of **these** phenomena as the interplay of two tendencies of the stories that we use to guide our actions. The first is their tendency to become more popular, **which**, in part, is due to the inexhaustibility of knowledge. The second is their tendency to undermine the conditions on which we base them. Repeatedly using these stories to guide our actions without considering how our actions change reality tends to lead us ever further away from **the least costly means of living well**. When these two tendencies unite, they lead us ever further away from **these** ideal **means of living well**. The further we are from **these** ideal **means**, the greater is our potential for catastrophes **caused by the sudden replacement of knowledge for non-knowledge resources**.”

### Chapter 3, Recursive Failures, third paragraph

Changed “our **models** makes **our models open-ended**” to “**the stories that we use to guide** our **actions** makes **these stories timeless**” in the fourth sentence.

Changed “**patriotic wars**” to “**financial collapses**” in the fifth sentence.

### Appendix B, Theism, first paragraph

“**The preceding arguments focused on individuals. Focusing on the universe as a whole leads to different problems, arguments, and conclusions. For example, the simplest theories for explaining the creation of the universe include a Creator.**”

was deleted.

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## Changes in Version 2007.05.07

### Preface, sixth paragraph

“Russell’s definition of philosophy is consistent with, if not based upon, the modern habit of confusing theology, religion, and faith. **Theology, religion, and faith are separate and distinct concepts. They are not** synonyms for the zealous and extra-reasonable pursuit of knowledge of God. **Theology is the pursuit of knowledge of God. Religion is the means of linking or relinking with something greater than ourselves; it is the means of satisfying what Albert Schweitzer called our need for mystical oneness. Faith is extra-reasonable certainty in our beliefs; it is what gives us**

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certainty in our beliefs beyond that offered by reason alone. We can imagine using these three concepts in conflict with the zealous and extra-reasonable pursuit of knowledge of God. We can imagine people pursuing knowledge of God who lack either religious zeal or faith in the existence of God. We can imagine people putting their faith in either atheistic political movements or the chance to win a week of Las Vegas debauchery. We can imagine atheists either putting their faith in the non-existence of God or pursuing the transcendent values of truth, justice, and beauty with the religious zeal. Again, theology, religion, and faith are separate and distinct concepts. They are not synonyms for the zealous and extra-reasonable pursuit of knowledge of God.”

was changed to:

“Russell’s definition of philosophy is consistent with, if not based upon, the modern habit of confusing theology, religion, and faith. From this modern view, all three concepts are synonyms for the zealous and extra-reasonable pursuit of knowledge of the Divine. In contrast, I contend that humans have a spiritual need to link or relink with something greater than themselves. Humanistic psychologist Abraham Maslow described this as the spiritual need of those who are living fully human lives to pursue the transcendent values of truth, beauty, and justice. Christian theologian, concert organist, medical doctor, and humanitarian Albert Schweitzer described it as the need for mystical oneness, which we satisfy by either denying or embracing the world and life. Because this spiritual need is independent of belief, I contend that in the pursuit of living a fully human life it is useful to distinguish between knowledge of the Divine, which I call theology; the pursuit of linking or relinking with something greater than ourselves, which I call religion; and certainty beyond reason, which I call faith. We can imagine using each of these three concepts in conflict with the zealous and extra-reasonable pursuit of knowledge of the Divine. We can imagine people pursuing knowledge of the Divine who lack either religious zeal or faith in the existence of the Divine. We can imagine people putting their faith in either atheistic political movements or the chance to win a week of Las Vegas debauchery. We can imagine atheists either putting their faith in the non-existence of the Divine or pursuing the transcendent values of truth, justice, and beauty with religious zeal. In the pursuit of living fully human lives, we owe it to ourselves to distinguish between the concepts of theology, religion, and faith.”

### Preface, eighth paragraph

Changed “confusion” to “modern confusion” in the first sentence.

### Preface, ninth paragraph

Changed “and capital” to “capital, and time” in the last sentence.

### Preface, tenth paragraph

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Changed “believe” to “contend” in the last sentence.

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## Changes in Version 2007.05.12

### Preface, third paragraph

Changed “assumptions” to “beliefs” in the second sentence.

Changed “assumptions” to “beliefs” in the third sentence.

### Preface, sixth paragraph, third sentence

“Because this spiritual need is independent of belief, I contend that in the pursuit of living a fully human life it is useful to distinguish between knowledge of the Divine, which I call theology; the pursuit of linking or relinking with something greater than ourselves, which I call religion; and certainty beyond reason, which I call faith.”

was changed to:

“Our spiritual need to link or relink with something greater than ourselves does not depend on what we believe or how strongly we believe. Hence, I contend that in our natural pursuit of living a fully human life it is useful to distinguish between knowledge of the Divine, which I call theology; the pursuit of linking or relinking with something greater than ourselves, which I call religion; and certainty beyond reason, which I call faith.”

Deleted the sentence: “In terms of the philosophy of science, all belief systems are underdetermined by data.”

### Preface, seventh paragraph

Changed “assumptions” to “beliefs” and “test” to “verify” in the second sentence.

### Preface, seventh paragraph, third sentence

“We can never be completely sure that all swans are either white or black, that nothing can exceed the speed of light, or even that all bachelors are unmarried.”

was changed to:

“We can never be completely sure that all swans are either white or black (the induction problem), that all bachelors are unmarried (the analytic versus synthetic truth problem), or that a particular belief is false when a belief system does not produce results that correspond to reality (the reductionism problem).”

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## Preface, tenth paragraph

Changed “**religion**, philosophy,” to “philosophy” and “**religion**, ethics” to “ethics” in the first sentence.

## Chapter 2, Wealth, first paragraph, last sentence

“**Timeless wealth includes practical wisdom, trust, freedom, capital, and time.**”

was deleted.

## Afterword, second paragraph

Changed “**ever more** wisely” to “wisely” in the third sentence.

## Afterword, second paragraph, first three sentences

“I believe that **those on the right ought to know that** we cannot separate our right to choose from our responsibility to choose (**ever more**) wisely. **Right wing** elites once declared that the United States owed its success to their Puritan heritage. Current **right wing** elites declare it was their Judeo-Christian heritage. Future **right wing** elites will likely declare it was their Abrahamic heritage.”

was changed to:

“I believe that we cannot separate our right to choose from our responsibility to choose wisely. **Political** elites once declared that the United States owed its success to their Puritan heritage. Current **political** elites declare it was their Judeo-Christian heritage. Future elites will likely declare it was their Abrahamic heritage. A wiser explanation is that the United States owes its success to its tradition of freedom and progress. Those who believe that they know the Truth (“a God’s eye view of the Universe”) ought to learn to see the world anew.”

## Afterword, third paragraph, third sentence

“I also believe that **those on the left ought to know that** progress creates stress. A government that seeks to protect its people from stress by retarding progress is unfair to its people, other societies, future generations, and other species. Those who **defend free speech but constrain free action** in order to **promote their vision of a just society** ought to heed Oliver Wendell Holmes’s argument that the purpose of free speech is to support free experiment.”

was changed to:

“I also believe that progress creates stress. A government that seeks to protect its people from stress by retarding progress is unfair to its people, other societies, future

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generations, and other species. Those people who **seek to limit freedom** in order to **reduce stress** ought to heed Oliver Wendell Holmes's argument about free speech and free experiment."

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### Changes in Version 2007.06.28

#### Preface, sixth paragraph

Appended the clause "**that does not depend on what we believe or how strongly we believe**" to the third sentence.

Changed "**those who are**" to "**people**" in the fourth sentence.

Deleted the fifth sentence:

**"Our spiritual need to link or relink with something greater than ourselves does not depend on what we believe or how strongly we believe."**

#### Preface, eleventh paragraph

Changed "**Good and the Truth**" to "**Truth and the Good**" in the eighth and ninth sentences.

#### Preface, thirteenth paragraph

Changed "**Good and the Truth**" to "**Truth and the Good**" in the first sentence.

#### Chapter 1, Setting Words Aright, first paragraph

Changed "**wisely**" to "**well**" in the second sentence.

#### Chapter 1, Setting Words Aright, last paragraph

Changed "**(ever more) wisely**" to "**make the best use of our knowledge**" in the last sentence.

#### Chapter 1, Excellence in Means, ninth paragraph

Changed "**ever more wisely**" to "**ever better**" in the second sentence.

#### Chapter 1, Excellence in Means, tenth paragraph, last sentence

***"People who seek to decide wisely look beyond the current "efficiency frontier."***

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was deleted.

## Chapter 1, Excellence in Living, second paragraph

Changed “**decide wisely**” to “**make the most of their knowledge**” in the second sentence.

## Chapter 1, Excellence in Living, third paragraph

Changed “**wisely**” to “**well**” in the first sentence.

“**Living well is the timeless end of achieving happiness. This is not the happiness that comes from satisfying what we want, but rather the happiness that comes from satisfying what we need to live what Aristotle called living a good life and psychologist Abraham Maslow called living a fully human life. See Chapter 2 on the distinction between the temporal and timeless concepts of consumption.**”

## Chapter 1, Excellence in Living, fourth paragraph

Changed “**wisely**” to “**well**” in the last sentence (2 occurrences).

## Chapter 1, Excellence in Living, last paragraph

Changed “**wisely**” to “**well**” in the first sentence.

Changed “**wisely**” to “**well**” in the second sentence.

## Chapter 1, A Timeless Model for Living Wisely, title

Changed “**Wisely**” to “**Well**” in the title.

## Chapter 1, A Timeless Model for Living Well, first paragraph, first sentence

Inserted the sentence: “**We seek to live well by living wisely, that is, by seeking to make the best use of all of our knowledge.**”

## Chapter 1, A Timeless Model for Living Well, last paragraph

Changed “**wisely**” to “**well**” in the last sentence.

## Chapter 2, The Wise Use of Concepts, title

Changed title to “**Introduction.**”

## Chapter 2, Introduction, first paragraph

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Changed “People who seek to” to “The first chapter explained how people who” in the first sentence.

### Chapter 2, Wealth, first paragraph

Changed “wisely” to “well” in the first sentence.

### Chapter 2, Wealth, first paragraph, footnote

“This teleonomic definition of wealth is not compatible with the current national income accounting scheme. See Appendix D.”

was changed to:

“Governing wisely is a matter of helping all of us decide ever more wisely. This calls for a timeless concept of wealth. Our current national income accounting system uses a temporal concept. This mistake creates major catastrophes. See Chapter 4 and Appendix D.”

### Chapter 2, Wealth, first paragraph

Changed “wisely” to “well” in the first sentence.

### Chapter 2, Consumption, first paragraph

“From the temporal view of modern economics, winning a fortune in the lottery is always good. From the timeless view of those who seek to live wisely, winning a fortune in the lottery can be bad if the winner is heading down a dark path. Understanding this difference calls for a deeper understanding of pleasure and pain.”

was changed to:

“Consuming is the process of using wealth to achieve our ends. From the temporal view of modern economics, consuming is the process of using wealth to satisfy our wants. Winning a fortune in the lottery is always good. From the timeless view of people who seek to make the most of their knowledge in order to live well, consuming is the process of using wealth to live well. Winning a fortune in the lottery can be bad if the winner is heading down a dark path. Understanding this difference calls for a deeper understanding of pleasure and pain.”

### Chapter 2, *Pleasure and Pain*, second paragraph

“There are two sorts of pleasure. The first is the pleasure that we derive directly from an activity, such as that which we derive from playing tennis or eating ice cream. The second is the pleasure that is the result of an activity. We can think of the first as



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pleasure-in-acting and the second as pleasure-in-being. We commonly refer to pleasure-in-acting as “pleasure” and pleasure-in-being as “joy.””

was changed to:

“There are two sorts of pleasure. The first is the pleasure that we derive directly from an activity. The second is the pleasure that is the result of an activity. We can think of the first as pleasure-in-acting and the second as pleasure-in-being. **Eating junk food gives us pleasure-in-acting. Eating healthy food gives us pleasure-in-being.** We commonly refer to pleasure-in-acting as “pleasure” and pleasure-in-being as “joy.””

### **Chapter 2, *Practical Wisdom*, first paragraph**

Changed “a good life” to “**well** (a good life)” in the first sentence.

Changed “**a good life**” to “**well**” in the second sentence.

### **Chapter 2, *Practical Wisdom*, second paragraph**

Changed “**wise**” to “**good**” in the first sentence.

### **Chapter 2, *Production*, first paragraph, last sentence**

“To produce **wisely** is to **seek** to produce ever more wisely.”

was changed to:

“To produce **well** is to produce (ever more) wisely.”

### **Chapter 2, *Profit*, first paragraph**

Changed “**wisely**” to “**well**” in the first sentence.

“To decide **wisely** is to **seek** to decide ever more wisely.”

was changed to:

“ To decide **well** is to decide (ever more) wisely.”

### **Chapter 3, *Refining Everyday Thinking*, third paragraph**

Changed “**seek to live**” to “live” in the last sentence.

### **Chapter 3, *Refining Economic Stories*, eighth paragraph**

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Changed “live **ever more** wisely” to “live wisely” and “live **a good life**” to “live **well**” in the fifth sentence.

### Chapter 3, *The Timeless Ideal*, first paragraph

Changed “**deciding ever more** wisely” to “**living** wisely” in the last sentence.

### Chapter 3, *The Timeless Ideal*, second paragraph, first sentence

“**Deciding more** wisely is a matter of converting new information into new applications of knowledge in our quest to live **wisely**.”

was changed to:

“**Living** wisely is **often** a matter of converting new information into new applications of knowledge in our quest to live **well**.”

### Chapter 3, *A Crude Look at the Whole*, second paragraph

Changed “**the effects of progress and poor decision-making**” to “**their**” in the second sentence.

### Chapter 3, *Moral Science*, last paragraph

Changed “**wisely**” to “**well**” in the fifth sentence.

### Chapter 4, *Key Factors*, title

Changed title to “**Introduction**.”

### Chapter 4, *Introduction*, first paragraph

“People live and work together to do together what they cannot do alone. Living and working together wisely calls for rules to govern how people live and work together. A government is a system of rules and a means of enforcing these rules.”

was changed to:

“**Moral science is the process of determining what is truly good. The convention of distinguishing between temporal and timeless ends by capitalizing timeless ends helps us to summarize this research program. Following this convention, the truth is correspondence to reality based on what we currently know; the Truth is correspondence to reality based on all that can be known. The good is what we need to live well based on what we currently know; the Good is what we need to live well based on all that can be known. We need the truth to pursue the Good. We also need the good to pursue the Truth. Hence, the pursuit of the Good and the pursuit of the**

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Truth are intertwined - pursuing one calls for pursuing the other. In as much as we are born with the need to live well, we are born with the need to pursue both the Good and the Truth. We are born to be researchers and research subjects in the research program of, by, and for intelligent life.

“We are not all knowing and all good. Our truth is not the Truth; our good is not the Good. We are not even angels, beings without the worldly concerns that arise from physical bodies. Hence, we can benefit from intellectual tools for helping us to live wisely, that is, for helping us to pursue the Good and the Truth.

“The first chapter of this book put forth a strategy for learning to live wisely. The second chapter put forth timeless concepts based on this strategy. The third chapter applied these timeless concepts to the problem of how best to pursue the Truth and the Good. This chapter applies these timeless concepts to the problem of how best to govern wisely, that is, how best to manage the rights for deciding how best to pursue the Truth and the Good.

### “**Sovereignty**

“A major source of conflict within any group living and working together is the issue of who has a particular right. One way to avoid such conflicts is to assign rights permanently, that is, to assign sovereign rights.

“For a sovereign right to be secure, those charged with securing it must believe that they ought to secure it. The belief that they ought to secure a sovereign right arises from the beliefs that its basis is good and that it will be exercised well. Further, for a sovereign right to be secure, those charged with securing it must have the coercive power needed to secure it.

“The need for coercive power to secure a sovereign right falls with the moral authority of the sovereign right. The moral authority of a sovereign right arises from the beliefs that its basis is just and that it will be exercised justly.

“There are three basic means of securing the beliefs that secure sovereign rights. The first is to tell stories that appeal to what people currently believe is good. We may call this the pragmatic approach. The second is to tell stories that attempt to change what people believe is good. We may call this the propaganda approach. The third is to tell stories that appeal to what people believe is the ideal good. We may call this the idealistic approach.

“Governments are experiments that test the claims of goodness that secure sovereign rights. If these experiments are well run, that is, if people act in accordance to the claims of goodness that secure sovereign rights, the success or failure of the government tells us something of about the truth of these claims. In scientific terms, the claims of goodness that secure sovereign rights are propositions.

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### “The Explicit Experiment

“If the United States of America is an exceptional nation, it is because of the sovereign rights story put forth in its Declaration of Independence:

“We hold these truths to be self-evident, that all men are created equal, that they are endowed by their Creator with certain unalienable Rights, that among these are Life, Liberty and the pursuit of Happiness.--That to secure these rights, Governments are instituted among Men, deriving their just powers from the consent of the governed, --That whenever any Form of Government becomes destructive of these ends, it is the Right of the People to alter or to abolish it, and to institute new Government, laying its foundation on such principles and organizing its powers in such form, as to them shall seem most likely to effect their Safety and Happiness.”<sup>2</sup>

“What makes this sovereign rights story truly exceptional is its form. A self-evident truth is a belief that is not only true but one that no one can imagine not being true. It is true beyond all doubt. The authors knew that their idealistic claims of sovereignty were not self-evident. Yet they claimed that they were. In effect, they were saying, “We hold these claims to be true beyond all doubt. We will act as if these claims are true beyond all doubt. In doing so, we seek to prove that these claims are true beyond all doubt.” They put their sovereign rights story in the form of a proposition to be tested.

“Abraham Lincoln confirmed this interpretation in a dedicatory remark to honor young men who had recently given their lives to continue what Lincoln saw as the American experiment. He ended his remark with an appeal not only to continue the experiment but also to expand it:

“Four score and seven years ago our fathers brought forth on this continent, a new nation, conceived in Liberty, and dedicated to the proposition that all men are created equal. “Now we are engaged in a great civil war, testing whether that nation, or any nation so conceived and so dedicated, can long endure. We are met on a great battle-field of that war. We have come to dedicate a portion of that field, as a final resting place for those who here gave their lives that that nation might live. It is altogether fitting and proper that we should do this.

“But, in a larger sense, we can not dedicate -- we can not consecrate -- we can not hallow -- this ground. The brave men, living and dead, who struggled here, have consecrated it, far above our poor power to add or detract. The world will little note, nor long remember what we say here, but it can never forget what they did here. It is for us the living, rather, to be dedicated here to the unfinished work which they who fought here have thus far so nobly advanced. It is rather for us to be here dedicated to the great task remaining before us -- that from these honored dead we take increased devotion to that cause for which they gave the last full measure of devotion -- that we here highly resolve that these dead shall not have died in vain -- that this nation, under God, shall have a new birth of freedom -- and that government of the people, by the people, for the people, shall not perish from the earth.”<sup>3</sup>

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“The idealistic story of sovereignty put forth in the Declaration of Independence is not the only American story of sovereignty. The United States Constitution puts forth a pragmatic story in the form of a social contract. In this story, sovereignty resides in “We the People of the United States.” Neither the Constitution nor its amendments mention the Creator. In fact, the first amendment:

“Congress shall make no law respecting an establishment of religion, or prohibiting the free exercise thereof; or abridging the freedom of speech, or of the press; or the right of the people peaceably to assemble, and to petition the Government for a redress of grievances.”<sup>4</sup>

has often been interpreted by the courts to deny public expressions that refer to the Creator. Perhaps the most eloquent defender of this competing story as the basis for the American experiment is Supreme Court Justice Oliver Wendell Holmes, who wrote the following in his dissenting opinion of a decision that upheld a law limiting free speech during the First World War:

“Persecution for the expression of opinions seems to me perfectly logical. If you have no doubt of your premises or your power and want a certain result with all your heart you naturally express your wishes in law and sweep away all opposition. To allow opposition by speech seems to indicate that you think the speech impotent, as when a man says that he has squared the circle, or that you do not care whole-heartedly for the result, or that you doubt either your power or your premises. But when men have realized that time has upset many fighting faiths, they may come to believe even more than they believe the very foundations of their own conduct that the ultimate good desired is better reached by free trade in ideas — that the best test of truth is the power of the thought to get itself accepted in the competition of the market, and that truth is the only ground upon which their wishes safely can be carried out. That at any rate is the theory of our Constitution. It is an experiment, as all life is an experiment. Every year if not every day we have to wager our salvation upon some prophecy based upon imperfect knowledge.”<sup>5</sup>

“There are at least two ways of reconciling these conflicting sovereign stories. One is to claim that the Declaration of Independence story concerns justice and the Constitution story concerns legality. This conflicts with the political agenda of those who want to enshrine their socialistic faith in law. Another is to dismiss the Creator statement in the Declaration of Independence as a nominally religious statement that has become ritual and non-religious through long customary usage. This claim of “ceremonial deism” conflicts with the political agenda of those who want to enshrine their theistic faith in law.”<sup>6</sup>

“True believers in socialism and theism share several beliefs. First, both believe that what they believe to be good is superior to what others believe to be good. Second, both believe that the government ought to protect their superior beliefs in the marketplace of ideas. Third, both believe that the government ought to use its power to persuade to promote their beliefs. In short, both believe that the government ought to insure the success of their beliefs of the good in the marketplace of ideas.

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“Both of these religious groups have seen past political success put the government at risk. The social justice inspired Smoot Hawley Tariff Act of 1930 and National Recovery Act (NRA) of 1933 extended and deepened the Great Depression. Had the Supreme Court not struck down Title I of the NRA in 1935, the United States might have followed Italy and Germany into national socialism or the Soviet Union into international socialism. The Christianity inspired Amendment XVIII to the Constitution, which outlawed the manufacture, sale, and transportation of intoxicating liquors in late 1917, led to widespread government corruption. Had this amendment not been repealed in late 1933, it might have so undermined the legitimacy of the government as to have made the government unable to cope with the crises of the late thirties and early forties.

### “The Sovereign Story of Moral Science

“The confused American experiment in government raises the question of how expansive a sovereign story ought to be. Is it wise to expand sovereign stories to include beliefs that can be tested in the marketplace of ideas? If not, what beliefs remain? What is the sleekest safe hull for a ship of state facing gales of creative destruction?

“Moral science provides us with a simple and straightforward answer to this question. Government ought to conform to moral science. Government of, by, and for intelligent life ought to be based on the research program of, by, and for intelligent life.

“Using the American Declaration of Independence as a model, moral science yields a simple story of sovereignty: We hold these beliefs to be true beyond all doubt, that all intelligent life has the sovereign right and responsibility to seek to live wisely.--That to secure this right and this responsibility, governments are instituted that derive their powers from the consent of the governed.--That whenever a government becomes an obstacle to this end, it is the right and the responsibility of the governed to alter or to abolish it, and to institute a new government, laying its foundation on such principles and organizing its powers in such form, as to them shall seem most likely to effect living wisely.

“The promise of this sovereign story is to improve the overall quality of decision-making, thereby yielding the greatest progress toward the timeless ideal with the least amount of turbulence in the flow of resources. Supported by good economic policies, this sovereign story should fulfill its promise. A ship of state so designed, handled well, should cut through turbulent seas like no other.”

“<sup>2</sup> The full text of the Declaration of Independence is available on the United States national archive site, <[http://www.archives.gov/national-archives-experience/charters/declaration\\_transcript.html](http://www.archives.gov/national-archives-experience/charters/declaration_transcript.html)>, (18 June 2007).”

“<sup>3</sup> Lincoln delivered this speech at the dedication of the Soldiers’ National Cemetery at Gettysburg, Pennsylvania on November 19, 1863. It is commonly known as the

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Gettysburg Address. This is the complete text of the Bliss Copy, which most historians believe to be the last copy written by Lincoln.”

“<sup>4</sup> The first ten amendments to the United States Constitution, which are known as the Bill of Rights, are available on the United States national archive web site, <[http://www.archives.gov/national-archives-experience/charters/bill\\_of\\_rights\\_transcript.html](http://www.archives.gov/national-archives-experience/charters/bill_of_rights_transcript.html)>, (18 June 2007).”

“<sup>5</sup> *Abrams v. United States*, 250 U.S. 616, 630 (1919) (Holmes, J., dissenting).

“<sup>6</sup> True believers in socialism and theism share several beliefs. First, both believe that what they believe to be good is superior to what others believe to be good. Second, both believe that the government ought to protect their superior beliefs of the good in the marketplace of ideas. Third, both believe that the government ought to use its power to persuade to promote their beliefs of the good. In short, both believe that the government ought to insure the success of their beliefs of the good in the marketplace of ideas.”

### **Chapter 4, Liberty, title**

Changed to the title to “**Economic Policy**.”

### **Chapter 4, Economic Policy, first paragraph, first sentence**

Inserted the sentences, “From the decision-oriented view of moral science, governing wisely is a matter of helping all of us to live wisely. One key factor in living wisely is the freedom to decide.”

### **Chapter 4, Economic Policy, first paragraph**

Changed “**government officials**” to “**policymakers**” in the last sentence

### **Chapter 4, Judge Interventions**

Replaced the title with the introductory sentence:

“One way that government policymakers can help us to decide wisely is judge their interventions rather than our behaviors.”

### **Chapter 4, Control the Money Supply Passively, first paragraph**

Changed “live wisely” to “live **ever more** wisely” in the first and fifth sentences.

### **Chapter 4, Lower Trade Barriers, first paragraph**

Changed “**human**” to “**person**” in the last sentence (2 occurrences).

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## Chapter 4, *Promote Practical Wisdom*, title

Changed title to “*Promote Moral Science.*”

## Chapter 4, *Promote Moral Science*, first paragraph

Changed “**Practical wisdom**” to “**It**” in the new third sentence.

## Chapter 4, *Promote Moral Science*, last paragraph

Changed “**research program of, by, and for intelligent life**” to “**moral science**” in the first sentence. Merged this single sentence paragraph with previous paragraph.

Changed “**Government officials**” to “**Policymakers**” in the last sentence.

## Chapter 4, *Justice*, title

Changed title to “*Promote Savings for Welfare.*”

## Chapter 4, *Promote Savings for Welfare*, second paragraph

Changed “**Government officials**” to “**Policymakers**” in the first sentence.

## Chapter 4, *Promote Savings for Welfare*, last paragraph

Changed “**decide ever**” to “**live**” in the last sentence.

## Afterword, third paragraph

Changed “**heed Oliver Wendell Holmes’s argument that the purpose of free speech is to support free experiment**” to “**remember Benjamin Franklin’s rebuke that those who would give up essential liberty to purchase a little temporary safety deserve neither liberty nor safety**” in the third sentence.

## Afterword, third paragraph, quote

““Persecution for the expression of opinions seems to me perfectly logical. If you have no doubt of your premises or your power and want a certain result with all your heart you naturally express your wishes in law and sweep away all opposition. To allow opposition by speech seems to indicate that you think the speech impotent, as when a man says that he has squared the circle, or that you do not care whole-heartedly for the result, or that you doubt either your power or your premises. But when men have realized that time has upset many fighting faiths, they may come to believe even more than they believe the very foundations of their own conduct that the ultimate good desired is better reached by free trade in ideas — that the best test of truth is the power of the thought to get itself accepted in the competition of the market, and that truth is



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the only ground upon which their wishes safely can be carried out. That at any rate is the theory of our Constitution. It is an experiment, as all life is an experiment. Every year if not every day we have to wager our salvation upon some prophecy based upon imperfect knowledge.”<sup>2</sup>”

“<sup>2</sup> *Abrams v. United States*, 250 U.S. 616, 630 (1919) (Holmes, J., dissenting).”

was deleted.

### Afterword, last paragraph, last two sentences

“I am a conservative idealist, by which I mean that I seek to conserve the ideals that I find in the Declaration of Independence, the Bill of Rights, and the Gettysburg Address. These ideals are classically liberal in means and progressive in ends.”

were deleted.

### Appendix A, last paragraph

Changed “wisely” to “well” in the last sentence.

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## Changes in Version 2007.06.30

### Preface, seventh paragraph, last sentence

Italicized the last sentence:

“*Judging our belief systems by determining the truth is an infinitely large problem.*”

### Preface, eleventh paragraph, second sentence

“There was a time when lovers of wisdom distinguished between the strategic and the tactical by capitalizing the strategic.”

was changed to:

“There was a time when lovers of wisdom distinguished between the timeless and the temporal by capitalizing the timeless. In military terms, they distinguished between the strategic and the tactical by capitalizing the strategic.”

### Preface, second to last paragraph, fifth sentence

“In military terms, they distinguish between the strategic and the tactical.”

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was moved to behind the sixth sentence.

### **Preface, last paragraph**

Changed “pursuing the truth and the good” to “pursuing the Truth and the Good” in the second to last sentence.

### **Chapter 4, Introduction, second paragraph, first two sentences**

“We are not all knowing and all good. Our truth is not the Truth; our good is not the Good.”

were changed to:

“We are not all knowing and all good: our truth is not the Truth; our good is not the Good.”

### **Chapter 4, Introduction, second paragraph, last sentence**

“Hence, we can benefit from intellectual tools for helping us to live wisely, that is, for helping us to pursue the Good and the Truth.”

was changed to:

“Hence, we can benefit from intellectual tools for helping us to pursue the Good and the Truth, that is, for helping us to live wisely.”

### **Chapter 4, Introduction, last paragraph, last sentence**

“This chapter applies these tools to the problem of how best to govern wisely, that is, how best to manage the rights for deciding how best to pursue the Truth and the Good.”

was changed to:

“This chapter applies these tools to the problem of how best to govern the process of pursuing the Truth and the Good.

“We govern wisely by managing rights and responsibilities well. A right is the authority to decide a matter. A responsibility is the obligation to exercise a right well.”

### **Chapter 4, Sovereignty, last paragraph**

Changed “propositions” to “propositions to be tested” in the last sentence.

### **Chapter 4, *The Explicit Experiment*, fifth paragraph**

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Changed “This” to “This **claim of a source of justice above and beyond the general will of society**” in the second sentence.

### Chapter 4, *The Explicit Experiment*, seventh paragraph

Changed “**of these** groups” to “groups **of true believers**” in the second sentence.

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## Changes in Version 2007.07.04

### Preface, sixth paragraph, third through sixth sentences

“In contrast, I contend **that humans have a spiritual need to link or relink with something greater than themselves that does not depend on what we believe or how strongly we believe. Humanistic psychologist Abraham Maslow described this as the spiritual need of people living fully human lives to pursue the transcendent values of truth, beauty, and justice. Christian theologian, concert organist, medical doctor, and humanitarian Albert Schweitzer described it as the need for mystical oneness, which people satisfy by either denying or embracing the world and life. Hence, I contend that** in our natural pursuit of living a fully human life it is useful to distinguish between knowledge of the Divine, which I call theology; the pursuit of linking or relinking with something greater than ourselves, which I call religion; and certainty beyond reason, which I call faith.”

were changed to:

“In contrast, I contend that in our natural pursuit of living a fully human life it is useful to distinguish between knowledge of the Divine, which I call theology; the pursuit of linking or relinking with something greater than ourselves, which I call religion; and certainty beyond reason, which I call faith.”

### Preface, eleventh paragraph

Changed “**I contend that they**” to “**They**” in the last sentence.

### Chapter 1, *A Timeless Model for Living Well*, last paragraph, third sentence

“The first is **practical wisdom — our** knowledge of how to decide wisely.”

was changed to:

“The first is **the** knowledge of how to decide wisely, **which we commonly call practical wisdom.**”

### Chapter 2, *Introduction*, first paragraph

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“The first chapter explained how people who live wisely use timeless concepts to select temporal ends and temporal concepts to select the best means to temporal ends. They plan their lives using timeless concepts and work their plans using temporal ones. This chapter puts forward timeless alternatives to the modern economic concepts of wealth, consumption, trade, production, and profit.”

was changed to:

“The first chapter explained how people who live wisely plan their lives using timeless concepts and work their plans using temporal ones. This chapter puts forth timeless alternatives to the modern economic concepts of wealth, consumption, trade, production, and profit.”

### Chapter 2, Wealth, first paragraph, footnote

“<sup>2</sup> Governing wisely is a matter of helping all of us decide ever more wisely. This calls for a timeless concept of wealth. Our current national income accounting system uses a temporal concept. This mistake creates major catastrophes. See Chapter 4 and Appendix D.”

was deleted.

### Chapter 3, Economics, third paragraph

Added the following footnote to the end of the second sentence:

“<sup>7</sup> More accurately, ‘cause’ is a cue for a tool for helping us to find problems to solve within a given set of conditions.”

### Chapter 3, Recursive Errors, last paragraph

Added the following footnote to the end of the last sentence:

“<sup>21</sup> A good example of pretending to be certain is our current national income accounting system, which uses a temporal rather than a timeless concept of wealth. See Appendix D.”

### Chapter 3, Computer Models, last sentence, footnote, first paragraph

“Regrettably, these high level models of the imperfect flow of economic resources take imperfect decision-making as a given and so tend to blind us to the most effective problem to solve, which is how best to improve the quality of decision-making.”

was changed to:

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“The purpose of these high level models of imperfect flow ought to be to improve flow by improving the quality of decision-making.”

### Chapter 3, *Computer Models*, first paragraph

Changed “these models” to “most of these models” in the last sentence of the footnote.

Changed “including” to “which includes” in the last sentence.

### Chapter 3, *Moral Science*, last paragraph

Changed “*intelligent life science*” to “*moral science*” in the last sentence.

### Chapter 4, *The Explicit Experiment*, second paragraph

“What makes this sovereign rights story truly exceptional is its form. A self-evident truth is a belief that is not only true but one that no one can imagine not being true. It is true beyond all doubt. The authors knew that their idealistic claims of sovereignty were not self-evident. Yet they claimed that they were. In effect, they were saying, “We hold these claims to be true beyond all doubt. We will act as if these claims are true beyond all doubt. In doing so, we seek to prove that these claims are true beyond all doubt.” They put their sovereign rights story in the form of a proposition to be tested.”

was changed to:

“What makes this sovereign rights story truly exceptional is its form. In his original draft of the Declaration of Independence, Thomas Jefferson opened the sovereign rights passage with the phrase, “We hold these truths to be sacred.” Benjamin Franklin struck through ‘sacred’ and wrote ‘self-evident.’ By changing this single word, Franklin changed the Declaration’s sovereign rights story to an explicit proposition to be tested.”

“ A self-evident truth is a belief that is not only true but one that no one can imagine not being true. It is true beyond all doubt. Franklin knew that the following claims of sovereignty were not self-evident. In effect, he was stating, “We hold these claims to be true beyond all doubt. We will act as if these claims are true beyond all doubt. In doing so, we seek to prove that these claims are true beyond all doubt.””

### Chapter 4, *The Explicit Experiment*, third paragraph

Changed “this interpretation” to “the experimental nature of the Declaration’s sovereign rights story” in the first sentence.

Changed “expand it” to “expand it beyond the three-fifths legal rendition frozen in the Constitution” in the second sentence.

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## Chapter 4, *The Explicit Experiment*, fifth paragraph

Changed “those” to “true believers in socialism” and “their socialistic faith” to “what they believe to be good” in the third sentence.

Changed “those” to “true believers in theism” and “their theistic faith” to “what they believe to be good” in the last sentence.

## Chapter 4, *The Explicit Experiment*, sixth paragraph

Changed “True believers in socialism and theism” to “These two groups of true believers” in the first sentence.

## Chapter 4, *The Sovereign Story of Moral Science*, third paragraph

Changed “right and responsibility” to “right” in the second sentence.

Changed “right and this responsibility” to “right” in the third sentence.

Changed “right and the responsibility” to “right” in the second sentence.

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## Changes in Version 2007.07.07

### Chapter 4, *The Sovereign Story of Moral Science*, third paragraph

Added the following footnote to the end of the last sentence:

“The sovereign story of moral science is similar to but more refined than the sovereign story of the Declaration of Independence. Both are based on the belief that we ought to pursue what is truly good for us. However, they differ as to what this is. The Declaration, as interpreted by philosopher Mortimer Adler, calls for us to pursue happiness *justly*. Moral science calls on us to pursue happiness *ever more justly* by living (ever more) wisely. For more on Adler’s interpretation of the Declaration of Independence, see his book, *We Hold These Truths* (New York, Macmillan Publishing Company, 1987).”

### Chapter 4, *Promote Moral Science*, first paragraph

Deleted “best” from the fifth sentence.

### Afterword, first paragraph

Changed “eight” to “nine” in the first sentence.

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Change Archive for 2006 - 2007

Deleted the second sentence: “**This is how it ought to be.**”

## Afterword, second paragraph

Changed “**Those**” to “**All**” in the last sentence.

## Afterword, third paragraph

Changed “**Those**” to “**All**” in the last sentence.

## Afterword, last paragraph, end

Added the sentence:

“**I am a member of the classical liberal party of life.**”

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## Changes in Version 2007.07.10

### Preface, first paragraph

Changed “**eight**” to “**nine**” in the first sentence.

### Preface, eighth paragraph, last sentence

“*Judging our belief systems by determining the truth is an infinitely large problem.*”

was replaced by the paragraph:

“**I put forth a very different view of our common search for the truth, for which I owe a great debt to Albert Einstein and W. V. O. Quine. Intellectual disciplines provide us with a variety of useful ways of organizing our sensations of reality into beliefs. I contend that the ultimate end of science is to rectify all of our beliefs into an internally consistent whole that not only reflects our sensations of the world accurately, but also helps us to live wisely. This is an infinitely large problem.**”

### Preface, ninth paragraph

Changed “**judging**” to “**rectifying**” in the last sentence.

### Preface, eleventh paragraph

Changed “**Albert Einstein**” to “**Einstein**” in the last sentence.

### Preface, last paragraph

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Changed “tool kit” to “toolkit” in all (3 occurrences).

### Chapter 3, title

Changed “**Economic** Science” to “**Moral** Science.”

### Chapter 3, Refining Everyday Thinking, fourth paragraph

Changed “explain” to “explain **parts of the world**” in the last sentence.

### Chapter 3, Moral Science, title

Changed “**Moral Science**” to “**The Knowledge Revolution**.”

### Chapter 3, Economic Science, second paragraph

Changed “logic” to “**economic** logic” in the last sentence.

### Chapter 3, Economic Science, last paragraph

Changed “logic” to “**economic** logic” in the fourth sentence.

Changed “**truth**” to “**Truth**” and “**good**” to “**Good**” in the fifth sentence.

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## Changes in Version 2007.07.14

### Preface, sixth paragraph, fourth through seventh sentences

“We can imagine using each of these three concepts in conflict with the **zealous and extra-reasonable pursuit of knowledge of the Divine**. We can imagine **people pursuing knowledge of the Divine who lack either** religious zeal **or** faith in the existence of the Divine. **We can imagine people putting their** faith in **either atheistic political movements or** the chance to win a week of Las Vegas debauchery. **We can imagine** atheists **either** putting their faith in the non-existence of the Divine **or** pursuing the transcendent values of truth, justice, and beauty with religious zeal.”

were changed to:

“We can **easily** imagine using each of these three concepts in conflict with the **other two**. We can imagine: **(1) theists without** religious zeal, **(2) theists without** faith in the existence of the Divine, **(3) theists with** faith in the chance to win a week of Las Vegas debauchery, **(4) atheists with** faith in the non-existence of the Divine, **and (5) atheists** pursuing the transcendent values of truth, justice, and beauty with religious zeal.”



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## Preface, seventh paragraph, last sentence

“To make matters worse, this problem extends to our beliefs about testing our beliefs.”

was deleted.

## Preface, ninth paragraph

Changed “belief systems by determining the truth” to “beliefs” in the last sentence.

## Preface, second to last paragraph

Changed “decision-making process” to “process” in the third sentence.

## Chapter 1, Setting Words Aright, last paragraph

Changed “think of” to “view” in the last sentence.

Changed “our knowledge” to “what we know” in the last sentence.

## Chapter 1, Excellence in Means, first paragraph

Changed “worldviews” to “views of the world” in the last sentence.

## Chapter 1, Excellence in Means, second paragraph

Changed “People who seek to make the most of their knowledge” to “To make the most of what we know, we need to” in the second sentence.

## Chapter 1, Excellence in Living, third paragraph, first sentence, footnote

“Living well is the timeless end of achieving happiness. This is not the happiness that comes from satisfying what we want, but rather the happiness that comes from satisfying what we need to live what Aristotle called living a good life and Abraham Maslow called living a fully human life. See Chapter 2 on the distinction between the temporal and timeless concepts of consumption.”

was changed to:

“Living well is the timeless end of living a fully human life. For more on what it is to live a fully human life, see Chapter 2 and Appendix B.”

## Chapter 2, Introduction, first paragraph

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Changed “people who live wisely plan their lives using timeless concepts and work their plans” to “we can make the most of what we know by planning our lives using timeless concepts and working our plans” in the first sentence.

### **Chapter 2, Consumption, first paragraph**

Changed “Winning” to “Hence, winning” in the second sentence.

Changed “seek to make the most of their knowledge in order to live well” was changed to “make the best use of what they know” in the third sentence.

Changed “Winning” to “Hence, winning” in the fourth sentence.

### **Chapter 2, Pleasure and Joy, second paragraph, fifth and sixth sentences**

“Eating junk food gives us pleasure-in-acting. Eating healthy food gives us pleasure-in-being.”

were changed to:

“Eating junk food yields pleasure-in-acting; eating healthy food yields pleasure-in-being.”

### **Chapter 2, Pleasure and Joy, sixth paragraph, last two sentences**

“Finding pleasure in running calls for investing in the physical ability to run. Finding pleasure in playing chess calls for investing in knowledge of how to play chess.”

were changed to:

“Finding pleasure in playing chess calls for investing in knowledge of how to play chess. Finding pleasure in running calls for training to run well.”

### **Chapter 2, Practical Wisdom, first paragraph**

Deleted “(a good life)” from the first sentence.

### **Chapter 2, Trade, first paragraph, end**

Added the sentence:

“The structure of commerce emerges from the complex interplay of trading costs.”

### **Chapter 3, Refining Economic Stories, seventh paragraph**

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Changed “seek to live wisely” to “make the best use of their knowledge” in the last sentence.

### Chapter 3, The Timeless Ideal, first paragraph

Changed “living” to “deciding” in the last sentence.

### Chapter 3, The Timeless Ideal, second paragraph

Changed “living” to “deciding” in the last sentence.

### Chapter 3, The Timeless Ideal, third paragraph

“People who seek to live wisely adapt to stress by deciding wisely. First, they try to find a better problem to solve. Finding a new problem to solve usually increases the stress that they pass on to others. Second, they relieve stress by acting efficiently. Acting efficiently lessens the stress that they pass on to others.”

was changed to:

“People who make the best use of their knowledge first try to find a better problem to solve. Finding a new problem often increases the stress that they pass on to others. Having found what they believe to be the best problem, they relieve stress by acting efficiently. Acting efficiently lessens the stress that they pass on to others.”

### Chapter 3, Recursive Failures, last paragraph, last sentence, footnote

Changed “See” to “For more on this, see” in the last sentence.

### Chapter 3, Computer Models, second paragraph

Changed “seek to live wisely” to “make the best use of what they know” in the second sentence.

### Chapter 4, *The Sovereign Story of Moral Science*, third paragraph, footnote

“Both are based on the belief that we ought to pursue what is truly good for us. However, they differ as to what this is.”

was changed to:

“Both are based on the belief that we ought to pursue happiness, that is, seek to satisfy what we need to live well. However, they differ in how we ought to pursue happiness.”

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## Changes in Version 2007.07.18

### Entire Work, Internet references

Confirmed Internet references and updated confirmation dates. HTML version references: Chapter 3, footnote 10; Chapter 4, footnotes 2, 5, & 10; Appendix A, footnote 1; and Appendix C, footnote 1. Word version will differ due to the difference in referencing chapter headings.

### Preface, third paragraph, second through fourth sentences

“All theories contain ignorance in the form of untestable beliefs. A good strategy for living contains a means of testing these beliefs. Hence, I ought to have wished for a method of weeding out members of the set of theories that we use to explain how to live.”

was changed to:

“I ought to have wished for a method of weeding out members of the set of theories that we use to explain how to live.”

### Preface, thirteenth paragraph

Changed “this process of breaking down things” to “the process” in the third sentence.

### Chapter 2, Wealth, first paragraph

Changed “get what we want” to “satisfy our wants” in the second sentence.

### Chapter 2, Pleasure and Joy, third paragraph

Changed “best defines” to “defines” in the first sentence (2 occurrences).

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## Changes in Version 2007.07.20

### Chapter 1, Excellence in Means, first paragraph

Changed “modern concept” to “modern (economic) concept” in the second sentence.

Changed ““efficiency”” to “efficiency” in the second sentence.

### Chapter 1, Excellence in Means, second paragraph

Changed ““efficiency”” to “efficiency” in the fourth sentence.

# Boundless Pragmatism, An Invariant View of Deciding Well

Change Archive for 2006 - 2007

## Chapter 2, Practical Wisdom, last paragraph

“There are three basic means of deciding. These are deliberation (**deciding formally**), decision rules (**rules of thumb / heuristics**), and discipline (**consciously formed habits**). Deliberation is thorough but costly. It consists of (1) finding a problem to solve; (2) formulating alternatives; (3) evaluating alternatives; (4) choosing an alternative; (5) carrying out the chosen alternative; and (6) learning from the experience. Decision rules are less thorough but also less costly. Discipline is the least thorough, least costly, and least susceptible to deprivation. Acting wisely is often a matter of knowing which of these three means to use.”

was changed to:

“There are three basic means of deciding. These are deliberation, decision rules, and discipline. **In its most complete form, deliberation** consists of (1) finding a problem to solve; (2) formulating alternatives; (3) evaluating alternatives; (4) choosing an alternative; (5) carrying out the chosen alternative; and (6) learning from the experience. **This formal process** is thorough but costly. Decision rules (**rules of thumb / heuristic methods**) are less thorough but also less costly. Discipline (**using consciously formed habits**) is the least thorough, least costly, and least susceptible to deprivation. Acting wisely is often a matter of knowing which of these three means to use.”

## Chapter 4, Sovereignty, fourth paragraph

**“There are three basic means of securing ~~the beliefs that secure~~ sovereign rights. The first is to tell stories that appeal to what people currently believe is good. We may call this the pragmatic approach. The second is to tell stories that attempt to change what people believe is good. We may call this the propaganda approach. The third is to tell stories that appeal to what people believe is the ideal good. We may call this the idealistic approach.”**

was reduced to a footnote to the last sentence in the third paragraph.

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## Changes in Version 2007.07.24

### Chapter 1, Excellence in Living, second paragraph, second sentence

Changed **“To make the most of what we know, we need to”** back to **“The wise”** in the second sentence.

### Chapter 4, title

Changed **“Governing Wisely”** to **“Government.”**

# Boundless Pragmatism, An Invariant View of Deciding Well

Change Archive for 2006 - 2007

## Chapter 4, The Explicit Experiment, second paragraph

Changed “to an explicit proposition to be tested” to “**from a moral argument** to an explicit proposition to be tested” in the fourth sentence.

## Chapter 4, The Explicit Experiment, second paragraph, footnote

“**A self-evident truth is a belief that is not only true but one that no one can imagine not being true. It is true beyond all doubt. Franklin knew that the following claims of sovereignty were not self-evident. In effect, he was stating, “We hold these claims to be true beyond all doubt. We will act as if these claims are true beyond all doubt. In doing so, we seek to prove these claims to be true beyond all doubt.”**”

was promoted to body text. Added the following footnote to the third sentence above:

“**For example, Franklin knew of the divine right of kings to rule over their subjects, which was the basis of the French monarchy.**”

## Chapter 4, The Explicit Experiment, fourth paragraph

Changed “**first amendment**” to “**First Amendment**” in the fourth sentence.

## Chapter 4, The Sovereign Story of Moral Science, first paragraph

Changed “**government**” to “**governance**” in the first sentence.

## Chapter 4, The Sovereign Story of Moral Science, third paragraph

Changed “**beliefs** to be **true beyond all doubt**” to “**truths** to be **self-evident**” in the second sentence.

## Chapter 4, Promote Savings for Welfare, first paragraph

Changed “live” to “**to live**” in the third sentence.

## Chapter 4, Promote Savings for Welfare, first paragraph

Changed “**altruistic**” to “**wise**” in the last sentence.

## Appendix B, Practical Benefits of Magical Mysticism, title

Changed “**Magical Mysticism**” to “**Mystical Oneness.**”

Added the paragraph:

## Boundless Pragmatism, An Invariant View of Deciding Well

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“Schweitzer embraced the practical benefit of ethical mysticism, which is the Kantian categorical imperative of revering life. Following the Confucian model of familial obligation, the debt that we owe to those who helped us, including those who provided us with the useful knowledge that we use at no cost, we pay to others by revering life.”

### Appendix B, Synthesis, end

Added the sentences:

“From the view of the research program of, by, and for intelligent life, we accept the timeless end of revering life as a proposition to be proven true beyond all doubt. We hold it to be true beyond all doubt. We act as if it were true beyond all doubt. In doing so, we seek to prove it true beyond all doubt. Following the logic of Benjamin Franklin, we hold it to be self-evident.<sup>16</sup>”

“<sup>16</sup> Followers of philosopher of science Karl Popper are fond of reminding us that science is about proving things false. From the temporal view, they are right. However, from the timeless view, they are wrong. The ultimate end of science is seeking what is true, not discarding what is false.”

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### Changes in Version 2007.07.26

#### Preface, sixth paragraph

Deleted “the concepts of” in the last sentence.

#### Preface, second to last paragraph

Changed “tool” to “tools” in the last sentence.

#### Chapter 1, A Timeless Model for Living Well, title

Changed “Well” back to “Wisely.”

#### Chapter 1, A Timeless Model for Living Wisely, first paragraph, first sentence

“We seek to live well by living wisely, that is, by seeking to make the best use of all of our knowledge.”

was changed to:

“We seek to live wisely by seeking to make the best use of our knowledge in our quest to live well.”

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## Afterword, first paragraph

Changed “learning to decide” to “living” in the third sentence.

Changed “deciding” to “living” in the last sentence.

## Appendix B, Practical Benefits of Magical Mysticism, first paragraph

Changed “which is the Kantian” to “which is its ability to promote the Kantian” in the first sentence.

## Appendix B, Practical Benefits of Magical Mysticism, last paragraph

Changed “A small event” to “In this way, a small event” in the fifth sentence.

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## Changes in Version 2007.07.28

### Chapter 1, A Timeless Model for Living Wisely, last paragraph

Changed “the” to “our” in the last sentence.

### Chapter 3, Economics, title

Changed title to “Living Wisely.”

### Chapter 4, Introduction, second paragraph

Changed “summarize” to “explain” in the second sentence.

### Chapter 4, Introduction, last paragraph

“We govern wisely by managing rights and responsibilities well. A right is the authority to decide a matter. A responsibility is the obligation to exercise a right well.”

was moved to the beginning of the Sovereignty section.

### Chapter 4, Sovereignty, new fourth paragraph

Deleted “for a sovereign right to be secure,” from the first sentence.

Changed “just” to “good” and “justly” to “well” in the last sentence.

Combined paragraph with the previous paragraph.



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## Chapter 4, The Explicit Experiment, second paragraph

Corrected omission of ‘and undeniable’ from Jefferson’s original draft. Added doubt to authorship of edit. Changed footnote from divine right of kings issue to authorship of edit issue.

## Chapter 4, The Explicit Experiment, fifth paragraph

Changed “One” to “The first” in the first sentence.

Changed “Another” to “The second” in the fourth sentence.

## Chapter 4, The Explicit Experiment, sixth paragraph

“These two groups of true believers share several beliefs. First, both believe that what they believe to be good is superior to what others believe to be good. Second, both believe that the government ought to protect their superior beliefs in the marketplace of ideas. Third, both believe that the government ought to use its power to persuade to promote their beliefs. In short, both believe that the government ought to insure the success of their beliefs of the good in the marketplace of ideas.”

was changed to:

“Both of these groups of true believers want the government to promote their beliefs about the good rather than allow these beliefs to succeed or fail in the marketplace of ideas, which is to say that both want their beliefs about the good to be held as self-evident truths. True believers in socialism want the government to administer social justice; true believers in theism want government to administer theistic justice. In effect, both groups of true believers want their means of linking or relinking with something greater than ourselves to be the state religion.”

## Chapter 4, The Explicit Experiment, last paragraph

“Both groups of true believers have seen past political success put the government at risk. The social justice inspired Smoot Hawley Tariff Act of 1930 and National Recovery Act (NRA) of 1933 extended and deepened the Great Depression. Had the Supreme Court not struck down Title I of the NRA in 1935, the United States might have followed Italy and Germany into national socialism or the Soviet Union into international socialism. The Christianity inspired Amendment XVIII to the Constitution, which outlawed the manufacture, sale, and transportation of intoxicating liquors in late 1917, led to widespread government corruption. Had this amendment not been repealed in late 1933, it might have so undermined the legitimacy of the government as to have made the government unable to cope with the crises of the late thirties and early forties.”

was reduced to a footnote to the last sentence of the sixth paragraph.

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## Chapter 4, Control the Money Supply Passively, first paragraph

Changed “**ever more** wisely” to “wisely” in the first and fifth sentences.

## Chapter 4, Choosing Governments, first paragraph

Changed “**decide ever more**” to “**live**” in the first sentence.

## Appendix B, Practical Benefits of Magical Mysticism, first paragraph

Added the sentence:

“**This rule for living well should aid the research program of, by, and for intelligent life better than any other.**”

## Appendix B, Practical Benefits of Magical Mysticism, second paragraph

Deleted “**(conceptual frameworks, belief systems, and world-views)**” from the last sentence.

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## Changes in Version 2007.07.31

### Chapter 3, Deciding Wisely, last paragraph

Changed “decision **failures**” to “**decisions**” in the last sentence.

### Chapter 4, Sovereign Rights, third paragraph

“For a sovereign right to be secure, those charged with securing **it** must believe that they ought to secure **it**. **The belief that they ought to secure a sovereign right** arises from the beliefs that **its** basis is good and that **it** will be exercised well. Further, those charged with securing **it** must have the coercive power needed to secure **it**. The need for coercive power **to secure a sovereign right** falls with the moral authority of the sovereign **right**. **The moral authority of a sovereign right arises from** the beliefs that **its** basis is good and that **it** will be exercised well.”

was changed to:

“For a **collection of** sovereign rights to be secure, those charged with securing **the rights** must believe that they ought to secure **them**. **This** belief arises from the beliefs that the basis **for the rights** is good and that the rights will be exercised well. Further, those charged with securing **the rights** must have the coercive power needed to secure **them**. The need for **this** coercive power falls with the moral authority of the sovereign,

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that is, with the general beliefs that the basis for the rights is good and that the rights will be exercised well.”

### Chapter 4, The Sovereign Story of Moral Science, third paragraph

“The sovereign story of moral science is similar to but more refined than the sovereign story of the Declaration of Independence. Both are based on the belief that we ought to pursue the timeless concept of happiness, which is the timeless result of the process of satisfying what we need to live well. However, they differ in how we ought to pursue happiness. The Declaration, as interpreted by philosopher Mortimer Adler, calls for us to pursue happiness justly. Moral science calls on us to pursue happiness ever more justly by living (ever more) wisely. For more on Adler’s interpretation of the Declaration of Independence, see his book, *We Hold These Truths* (New York, Macmillan Publishing Company, 1987).”

was changed to:

“Arguably, the sovereign story of moral science is simply a refinement of the sovereign story of the Declaration of Independence. Both are based on the belief that we ought to pursue happiness, which is the timeless result of the process of satisfying what we need to live well. The Declaration, as interpreted by philosopher Mortimer Adler, calls for us to pursue happiness justly. Moral science calls on us to pursue happiness wisely, which is to say, ever more justly. For more on Adler’s interpretation of the Declaration of Independence, see his book, *We Hold These Truths* (New York, Macmillan Publishing Company, 1987).”

### Chapter 4, Promote Savings for Welfare, last paragraph, last sentence

Added footnote:

“<sup>16</sup> Here again, we see the difference between living wisely and allocating efficiently. From the timeless view of living wisely, we owe a debt to those who created the knowledge that we use at no cost. Albert Schweitzer’s categorical imperative calls on us to pay this debt by revering life. In theory, this universal rule for living promotes the research program of, by, and for intelligent life better than any other universal rule for living. From the temporal view of allocating efficiently, our interest in how others choose to live is external to the problem of how best to allocate scarce resources. The modern economic solution to this externality problem involves making all information about how we choose to live our lives freely available to everyone else. Better a bit of government intervention than the loss of all privacy. Compared to the loss of all privacy, a universal welfare savings plan and progressive taxation does not look so onerous.”

### Appendix B, Practical Benefits of Magical Mysticism, first paragraph

Changed “This” to “In theory, this” in the last sentence.

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## Changes in Version 2007.08.08

### Preface, third paragraph

Appended third paragraph to second paragraph.

### Preface, new sixth paragraph

Changed “**produce**” to “**predict**” in the last sentence.

### Chapter 2, Pleasure and Pain, sixth paragraph

Changed “**running**” to “**swimming**” and “**run**” to “**swim**” in the last sentence.

### Chapter 4, Sovereign Story of Moral Science, third paragraph, footnote

Changed “wisely, **which is to say,**” to “**(ever more)** wisely, **hence**” in the fourth sentence.

### Appendix B, Practical Benefits of Magical Mysticism, first paragraph

“Schweitzer embraced the practical benefit of ethical mysticism, which is its ability to promote the Kantian categorical imperative of revering life. **Following the Confucian model of familial obligation,** the debt that we owe to those who helped us, including those who provided us with the useful knowledge that we use at no cost, we pay **to others** by revering life. In theory, this rule **for living well** should aid the research program of, by, and for intelligent life better than any other.”

was changed to:

“Schweitzer embraced the practical benefit of ethical mysticism, which is its ability to promote the **universal moral rule** (Kantian categorical imperative) of revering life. **Unlike modern economics, this rule addresses the problem of what we owe to the people who created the knowledge that we use freely. According to this rule,** the debt that we owe to those who helped us, including those who provided us with the useful knowledge that we use freely, we pay by revering life. In theory, this **universal moral rule** should aid the research program of, by, and for intelligent life better than any other.”

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## Changes in Version 2007.08.31

### Preface, sixth paragraph, third sentence

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Changed “we can never verify completely” to “are not definite” in the second sentence.

Changed “swans are either white or black” to “crows are black” in the third sentence.

### **Chapter 4, third paragraph, third sentence**

Inserted the following sentence:

“Roman Emperor Tiberius had to maintain the good will of the Praetorian Guard; pirate Henry Morgan had to maintain the good will of his crew; and the leaders of modern democracies need to maintain the good will of their military and police forces.”

### **Chapter 4, The Explicit Experiment, fourth paragraph**

Changed “story of sovereignty” to “sovereign story” in the first sentence (2 occurrences).

### **Chapter 4, The Sovereign Story of Moral Science, third paragraph**

Changed “story of sovereignty” to “sovereign story” in the first sentence.

### **Appendix B, Practical Benefits of Mystical Oneness, first paragraph**

Changed “pay” to “pay to others” in the third sentence.

Changed “other” to “other universal moral rule” in the last sentence.

### **Appendix B, Practical Benefits of Mystical Oneness, last paragraph**

Appended the last paragraph to the second to last paragraph. Added the following sentence to the end of the paragraph:

“Mystics of many religions have learned that breaking this stream of words by embracing magical mysticism can help us to change our mental worlds for the better.”

### **Appendix B, Synthesis, first paragraph, last three sentences**

“From the view of the research program of, by, and for intelligent life, we accept the timeless end of revering life to be the best universal as a proposition to be proven true beyond all doubt. We hold it to be true beyond all doubt. We act as if it were true beyond all doubt. In doing so, we seek to prove it true beyond all doubt. Following the logic of Benjamin Franklin, we hold it to be self-evident.<sup>167</sup>”

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“<sup>16</sup> Followers of philosopher of science Karl Popper are fond of reminding us that science is about proving things false. From the temporal view, they are right. However, from the timeless view, they are wrong. The ultimate end of science is seeking what is true, not discarding what is false.”

were deleted.

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### **Changes in Version 2007.09.10**

#### **Chapter 3, Refining Everyday Thinking, last paragraph, fourth sentence**

Added the footnote:

“Followers of philosopher of science Karl Popper are fond of reminding us that science is about proving things false. From the temporal view, they are right. However, from the timeless view, they are wrong. The ultimate end of science ought to be seeking the whole truth, not discarding what is false.”

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### **Changes in Version 2007.09.31**

#### **Preface, third paragraph**

Italicized “is” in the first sentence and “is the pursuit of” in the third sentence.

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### **Changes in Version 2007.12.22**

#### **Preface, eleventh paragraph, last two sentences**

“To students of complexity science, there is some beauty in unpacking this argument. There was a time when lovers of wisdom distinguished between the timeless and the temporal by capitalizing the timeless. In military terms, they distinguished between the strategic and the tactical by capitalizing the strategic. Using this bygone convention, knowing the truth is believing well based on what we currently know; knowing the Truth is believing well based on all that can be known. The good is what we need to live well based on what we currently know; the Good is what we need to live well based on all that can be known. We need the truth to pursue the Good. We also need the good to pursue the Truth. Hence, the pursuit of the Good and the pursuit of the Truth are intertwined - pursuing one calls for pursuing the other. In as much as we are born with the need to live well, we are born with the need to pursue both the Truth and the Good. To believe that we can break down the timeless pursuit of the Truth and the

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Good, which are intertwined, into the temporal search for the truth and the temporal search for the good is to confuse the complex with the merely complicated.”

was deleted.

## Preface, second to last paragraph, last two sentences

Changed “both the Truth and the Good” to “practical wisdom” in the second sentence.

## Preface, last paragraph

Changed “The” to “My” in the first sentence.

## Preface, last paragraph, last two sentences

“In the third, I apply this toolkit to the problem of pursuing the Truth and the Good. In the last chapter, I apply this toolkit to the problem of governance.”

were changed to:

“In the third, I apply this toolkit to the problem of believing well. In the last chapter, I apply it to the problem of governing well.”

## Chapter 2, Pleasure and Pain, third paragraph, first two sentences

“In Western ethics, Aristotle defines pleasure and Spinoza defines joy. Aristotle defined pleasure as losing ourselves in activity.”

were changed to:

“In Western ethics, Aristotle defined pleasure as losing ourselves in activity.”

## Chapter 2, Pleasure and Pain, last paragraph

Changed “Spinoza” to “Seventeenth century Dutch philosopher Baruch Spinoza” in the first sentence.

## Chapter 2, Pleasure and Pain, last paragraph

Changed “using consciously formed habits” to “consciously formed habits” in the fifth sentence.

## Chapter 3, title

Changed title from “Moral Science” to “Science.”

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## Afterword, last paragraph, last sentence

“I am a member of the classical liberal party of life.”

was deleted.

## Appendix B, Synthesis

Changed title from “**Synthesis**” to “**Conclusion.**”

“Materialists and dualists ought to share the timeless end of revering life.<sup>15</sup> Accepting it turns postmodern cacophony into improvisational jazz.”

<sup>15</sup> We use intellectual tools to help us to choose what to do. These tools come in two types. The first helps us to choose “good” temporal ends. The second helps us to choose “right” rules for living wisely. When we use these tools to make major decisions, we ought to compare the results of more than one tool. The less the tools that we use have in common, the less the risk that results contain a common error. Hence, we ought to use both tools that aim at “good” temporal ends and tools that aim at “right” rules for living wisely. We also ought to use only those tools that aim at the highest form of justice that we can imagine. *We ought to use only those tools that aim at the timeless end of revering life.*”

was changed to:

“We use intellectual tools to help us to choose what to do. These tools come in two types. The first helps us to choose “good” temporal ends. The second helps us to choose “right” rules for living wisely. When we use these tools to make major decisions, we ought to compare the results of more than one tool. The less the tools that we use have in common, the less the risk that results contain a common error. Hence, we ought to use both tools that aim at “good” temporal ends and tools that aim at “right” rules for living wisely. We also ought to use only those tools that aim at the highest form of justice that we can imagine. *We ought to use only those tools that aim at the timeless end of revering life.*”

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## Changes in Version 2007.12.31

### Chapter 2, Practical Wisdom, second paragraph

Changed “satisfy **wisely**” to “satisfy” in the third sentence.

### Chapter 2, Two Means of Living Wisely, first paragraph, first sentence

“Aristotle and Spinoza provide us with different means of living **wisely**.”



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was changed to:

“Again, we seek to live wisely by seeking to make the best use of our knowledge in our quest to live well. Aristotle and Spinoza provide us with different means of seeking to live wisely.”

### Chapter 4, Introduction, first paragraph

Changed “moral science” to “timeless science” in the first and second sentences.

### Chapter 4, Sovereignty, first paragraph, first sentence

“We govern wisely by managing rights and responsibilities well.”

was changed to:

“Governing any group living and working together is a matter of managing rights and responsibilities.”

### Chapter 4, The Explicit Experiment, second paragraph, last seven sentences

“A self-evident truth is a belief that is not only true but one that no one can imagine not being true. It is true beyond all doubt. The authors knew that the following claims of sovereignty were not self-evident. For example, they knew of the divine right of kings. In effect, they were stating, “We hold these claims to be true beyond all doubt. We will act as if these claims are true beyond all doubt. In doing so, we seek to prove these claims to be true beyond all doubt.””

were changed to:

“In effect, Franklin was stating, “We hold these claims to be true beyond all doubt. We will act as if these claims are true beyond all doubt. In doing so, we seek to prove these claims to be true beyond all doubt.””

### Chapter 4, The Sovereign Story of Moral Science, title

Changed “Moral Science” to “Timeless Science.”

### Chapter 4, The Sovereign Story of Timeless Science, second paragraph

Changed “moral science” to “timeless science” in the first and second sentences.

### Chapter 4, The Sovereign Story of Timeless Science, third paragraph

Changed “moral science” to “timeless science” in the first sentence.

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## **Chapter 4, Economic Policy, first paragraph**

Changed “**moral** science” to “**timeless** science” in the first sentence.

## **Chapter 4, Promote Moral Science, title**

Changed “**Moral** Science” to “**Timeless** Science.”

## **Chapter 4, Promote Timeless Science, first paragraph**

Changed “**moral** science” to “**timeless** science” in the last sentence.

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