

Chapter 2. Home on the Range Where Desires and Beliefs Like to Play.

In Observer Physics we will explore a range that encompasses two great spaces, the World Space and the Mind Space. One is what we call the physical world. Traditionally physics has been the discipline that proposes to explain how the World Space works. According to modern physics the World Space has a vast range from the Planck scale at 10^{-35} m out to at least 10^{26} meters for the visible universe, and perhaps quite a bit beyond that. Four forces govern the physical world: gravitational, electromagnetic, weak, and strong. The physical structure of matter is built from fundamental subatomic particles to atoms, to molecules, to macroscopic structures, to cosmic structures that include vast galaxies, galactic clusters, and finally the universe as a whole. We will probe some of the unsolved mysteries of physics and see what we come up with. How do particles acquire mass? What is the relation between the forces? Where do the forces come from and what are they? What is time? How did the universe get started, and what may be its final outcome? How did WE get involved?

We will also explore the range of the Mind Space. This is considered subjective. Many also find it mysterious. It is less well studied and understood. We will develop a theory that World Space and Mind Space come from the same source and are connected. Therefore they can and must be studied together as a complete system. Our hypothesis is that both of these spaces are constructed out of beliefs. We will explore how beliefs are made and how they can be used to build structures in Mind Space and World Space.

Let's first see what we mean by a belief. The best way is to consider examples, types of beliefs. Any idea or thought is a belief. Any word is an expression of a belief. So take your dictionary and thumb around in it. Every word represents a belief. The sentences I am writing are beliefs. This book is a belief system. Your whole world is defined by the beliefs that you hold.

We have beliefs about the world, beliefs about ourselves and our lives, beliefs about other people and their lives, about our bodies and our minds, our spiritual lives, our feelings and attitudes. We have abstract mental beliefs, such as mathematical ideas and philosophical ideas. We have beliefs about communication. We also have meta-beliefs, beliefs about beliefs. This paragraph consists of metabeliefs. We have operational beliefs that we use to govern our lives, beliefs about how we ought to behave or ought not to behave, about duties, and obligations, agreements and responsibilities. Some of these are limiting beliefs. We also have beliefs about problems, uncertainties, unknowns, and worries. We have judgmental beliefs that set values on other beliefs. We have beliefs about truth, perception, life, and meaningfulness. And we have beliefs about our desires and preferences and goals. We can also have beliefs about how to manage beliefs.

Harry Palmer's **Avatar Materials** consist of a set of beliefs deliberately designed as a technology for managing beliefs. These "Avatar Material" beliefs belong to a particular class of operational metabeliefs.

The above list is just intended to give you an idea of the range of beliefs. You may add

your own beliefs and any others that I may have left out. In **Living Deliberately**, Chapter 15, Palmer offers a nice sample list of beliefs. Later on in this chapter we will discuss a typology of four major classes of belief systems that Palmer has identified.

Exercise: To explore beliefs, you can begin with some of the exercises in **ReSurfacing**. Do #1 ("Personality Profile"), #10 ("Emotion and Importance"), #16 ("Self-Deception Signals"), #20 ("Conviction"), #21 ("Operational Beliefs), #22 ("Belief and Indoctrination"), #24 ("Exploring Definition"), and #25 ("Motivation"). These will give you a tour of some of the beliefs you hold regarding who you are, things that are important to you, ways you may limit yourself, how strongly you hold beliefs, beliefs with which you manage your life, indoctrinated beliefs, your identity -- how you define yourself --, and why (your belief role models.)

To get a peek at belief systems held by other people do the "Compassion Exercise" (#17) in **ReSurfacing**. This will often give you better understanding of what others -- and you -- believe than listening to what they say.

If you want to go a bit "deeper" into things and peer under the hood to look at the beliefs you may hold that you are not consciously aware of, then find a partner and have him take you through exercise #23 "Transparent Beliefs." Sections II and III of the **Avatar Materials** are for the more intrepid souls who are ready for adventure and really want to explore. These materials take you into "no-limit" territory. They also really put you in the driver' s seat.

The range of creation goes from pure undefined awareness, to beliefs (thoughts), to physical expressions, and then via experience back to pure undefined awareness. Where your experience happens to be in that range depends on the current status of your attention. It is possible to have the thought or belief and not the physical experience, but once you have the physical experience, the belief is always there behind it. Another way of saying this is that a belief is a subtle form of experience, and an experience is a grosser, more expressed, form of a belief. Yet another way of saying this is that physical experience is a projection of beliefs. Projection occurs through an operation of the will called resistance.

Physics cherishes measurement and precision. However, there is a limit to precision -- by definition.

* "Precise: clearly expressed or delineated; definite." (**AHD**)

Precision is a creation. A creation is something defined. We do not even have to know what the definition of precision is. A creation is something that has limits. So every creation (by definition) has a limit somewhere. It is a bounded expression of unbounded awareness or pure creative intelligence. Precision is not only a defined creation, it is defined as a state of clear expressed definition. Perhaps you can have unlimited imprecision, but that just means no precision at all. Thus zero is its limit. Zero precision is a completely undefined state.

Negative imprecision sounds like it is getting back into precision again. It reminds one of Schroedinger's expression, "negative entropy." Since entropy implies a multiplicity of distinct unconnected states, negative entropy would imply a holistic organism consisting of component parts. Larger multiplicities increase positive entropy, and more complex organisms display greater negative entropy.

You could have a perfectly "precise" number, but that is not really precision, because it is abstract and lacks a referent. Precision refers to measurement, which is a form of mapping. For precision to manifest, the precise number must refer to a precise object.

The notion of mapping derives from the model of the self experiencing the object of experience. You are you. You have mapped your notion of self onto a set of parameters that you consider you. That is your identity. Precise mapping exists only in the world of pure math. (Recall our discussion of the lens between mathematics and physics.) No object can be measured perfectly precisely. You reach a point where things get fuzzy. The ultimate reason for that has to do with the nature of attention and pure awareness.

(Optional Experiment.) If you practice TM, you can do this experiment. Meditate for twenty minutes. The experience of attention focusing during the meditation is that it gets finer and finer as it follows the meditation process, and then -- suddenly the attention transcends the boundaries of thought and the mind expands. Attention suddenly defocuses and awareness becomes unbounded. Ironically, when you get to the finest focus, you get unfocused. (Caution: If you want to do this experiment, you will probably get the best results using the TM technique. There are many techniques of meditation available, but they do not necessarily result in the transcending process referred to here. If you do not know the TM technique, either learn it or go back and repeat the attention exercises suggested in Chapter 1. They will give you a little flavor of this experiment.)

Maharishi refers to the "range" of creative intelligence as extending from "here to here through there." The TM process recapitulates this range in miniature. Between each thought is a gap. It is neither thought (A) nor thought (B). When a meditator transcends during TM practice, he experiences directly with restful alertness the gap between two thoughts. The last thought (A) drops off, and then, after some gap, another thought (B) appears. In between the mind is unbounded, and the attention is not focused on anything. There is just pure awareness or inner wakefulness. This process goes on unconsciously all the time for everyone, but most of the time the attention tends to be held on the content level of individual thoughts. The gap passes unnoticed. But anyone can tell that thoughts do change. They come and go in the mind. No one thinks the same thought all day long.

During meditation the thought process is clearly experienced in an innocent and natural way. (Innocent and natural just means that there is no straining or effort or manipulative intervention involved other than the processes of thoughts and awareness that occur

spontaneously all the time. The technique is quite simple and cleverly designed to allow the mind to follow its own natural tendencies.) The eventual realization is that the gap is a steady state condition that underlies all thought activity. It is always "here" in the "here and now". Thought activity is a temporary excursion to "there." This is Maharishi' s basis for claiming that the range of creation is from here to here through there. This is an experiential reality for any TM meditator who has practiced meditation for a while. (How long "while" takes depends on the individual.)

This experiment is qualitative rather than quantitative. But research has been done that indicates physiological changes associated with the meditation experience of restful alertness. There is a distinct condition in which the body is deeply at rest, but the mind is awake and fully alert. It differs markedly from sleeping, dreaming, or active waking states.

Experiment: Find a partner to be your coach and have them take you through the little guided procedure called "The Expansion Exercise" (**ReSurfacing**, Exercise #26.) Relax and enjoy the experience of expanding attention step by step just on the thinking level alone. This will also give you a little foretaste of what it is like when the attention transcends. With practice you can do this exercise on your own.

When a physicist does calculations or experiments, he wants to attain the highest degree of accuracy possible. Amazing degrees of accuracy have been attained compared to our usual standards of measurement, but no one has ever achieved perfect accuracy except by defining the measurement arbitrarily. That way you can' t go wrong. For example, the gravitational constant is known by experiment roughly to about five decimals. Gravity is a weak force and thus is hard to measure. The electron magnetic moment is known with fantastic accuracy, theory agreeing with experiment to about ten decimal places. Pi has been calculated to an accuracy of over 2×10^{11} digits. The permeability constant used in the study of electromagnetism is known with absolute precision because it is defined arbitrarily by physicists.

According to modern quantum mechanics, the act of measurement brings an object into concrete reality. How can you tell the difference between creating and measuring a state if the act of measurement brings the state into concrete reality? A further interesting feature of measurement is that the more we know about the state of the concrete reality we have measured, the less we know about the state of its conjugate variable.

This feature of modern physics occurs because the physical world at the quantum level tends to be set up in conjugate pairs that relate via a quantum constant. These pairs are often reciprocal. In the case of measurement, we must choose which of the conjugate variables we want to measure. A major example is Heisenberg' s Uncertainty Principle, and we will play with it quite a bit in this discourse for it is one of the keys to understanding quantum mechanics.

We might choose to look at a system in terms of momentum and displacement. We must choose which parameter we are going to put attention on and measure. If the

measurement is made at the quantum level, precise knowledge of the momentum will be sacrificed by our decision to measure displacement, and vice versa. Or we might choose to measure either energy or time interval. However we look at the system, once our choice is made, we can narrow the range of precision on the variable we choose as much as we like, given our measuring instruments and patience and sharpness of vision. But the range of that one variable is reciprocally tied to the range of its conjugate variable. Thus, the more precisely we know that one variable, the less precisely we know the other variable. This is a real trade off.

Mark Merner believes this feature of quantum mechanics prevents causality violations in nature. He puts it this way. The more you know about how an event will turn out, the less you can do about it. One hundred percent foreknowledge means zero ability to change things. Zero foreknowledge means one hundred percent ability to change things. Fifty percent foreknowledge means fifty percent ability to change things.

He may be right, but I suspect that this is his personal belief. From his viewpoint, that is how things work. From a different viewpoint, things might work very differently.

My explanation is simply that you are acting as the creator responsible for deciding on a particular certainty (or uncertainty), and to doubt your own decision regarding certainty (or uncertainty) would be a complete self-contradiction and abrogation of personal responsibility. If you could change the future that you "knew with certainty", then you didn' t really know it with certainty. You either hadn' t really made up your mind, or you changed your mind, or you lied to yourself or someone. If you change your future, then you transform a possible uncertainty in the past into a certainty in the past when you make the certainty you choose for the future certain in the future. Thus causality violation is automatically avoided by the proper assignment of responsibility for all outcomes to the observer. This is the critical importance of Observer Physics. It cultivates a sense of responsibility in the physicist. He realizes that the certainty or uncertainty of a situation is his personal responsibility and no one else' s. The possibility of "causality violation" implies a rejection of responsibility. If you are the Prime Mover, by definition you can not violate your own causality. All you can do is confuse yourself and then pretend that it wasn' t your fault. You can put on a good show and entertain yourself.

The idea that we have some choices and some requirements is passing the buck. Ultimately it is the observer who fixes or frees conjugate variables. You have just as much freedom as you give yourself. You are only required to do what you require yourself to do. Each person is his/her own harshest judge.

Exercise: Do Exercise #12 in **ReSurfacing**, "Releasing Fixed Attention." It is good to have a friend coach you in this exercise.

One of the fundamental design features of science is that there is no preferred way for things to be. We decide what we want to look at, and then we describe what we see. If someone can look at the same thing and describe it differently or better, then that' s

wonderful.

Science has pitfalls. (There' s a loaded belief.) A field of study that professes to be a science, but assumes that it has the final word, has abrogated its responsibility as a science, at least in my book. I believe that science is a flexible, open-ended discipline. At the beginning of the twentieth century a noted scientist predicted that heavier-than-air flight was impossible. Another authority once explained that he had reviewed all the patents and inventions and that all the major inventions had already been made.

Here is another pitfall. The more conservative followers of a paradigm often become defensive about new developments, as if they might threaten the status quo. New ideas may indeed be suspect, but are not necessarily wrong. As we shall see, right and wrong are secondary judgments that avoid getting to the real point of an issue. It is always possible to preserve the classical integrity of a solid science while still evolving it into new areas and refinements. A wheel is always a wheel, and the technology of wheels can be applied in many ways, times, and places. But the technology stays the same. That is its self-defining classical "purity." We have seen how well Newton' s laws have withstood the onslaught of relativity and quantum mechanics. They remain at the core of modern physics.

A beautiful corollary of this principle is that any paradigm worth its salt is also robust. You can break a particular wheel, but you can not break the principle of the wheel. Though a principle may get lost at times in the vagaries of history, any reasonably observant person can always recover it. Thus it is silly to worry about defending a paradigm as if it were something very fragile that required draconian measures to protect. We do not have wheel police watching out to protect the purity of wheels. Wheels are simple, but subtle. The need to get overly protective, a phenomenon often observed in political systems, suggests ulterior motives (lack of integrity) in an organization. To claim you have something really basic and cool and then not to be cool about it suggests something else is going on other than what you are talking about.

The native Mayans understood the principle of the wheel, because it shows up in their art. However, they deliberately chose never to use it as a "utilitarian" tool in their society. They had roads as good as the Romans, but no wagons. Hmmm.

The uncanny ability of mathematical (mental) forms to model physical objects and phenomena is one of the keys to science and its success. It' s all done with smoke and mirrors as they say. In quantum mechanics the mirror idea is variously called conjugation, correlation, and entanglement. But there is a special point that is often overlooked. In an ordinary mirror the reflected image is reversed with regard to space. In a conjugate mirror the reflected image is reversed with regard to time. In a MATHEMATICAL (MENTAL) mirror, as we saw in chapter one, the reflected image is reversed with regard to CERTAINTY. In the mansion of our world there may be many mirrors. It' s quite a funhouse.

Math is a precise mental reflection of the objective world, or we might better say, math is

a clear and precisely focused mental formulation of an idea. This clarity and intensity of attention allows an idea to more easily become a physical reality. Whence the power of applied math and applied science. But people should know that a MENTAL image of a PHYSICAL object is flipped similar to the way an ordinary mirror flips its image spatially. Here the image flips in terms of certainty. This fundamental principle of observational physics is worth emphasizing and exploring deeply.

There are no immutable laws of nature (other than the law that there are no immutable laws of nature). There are only mutually shared beliefs. Beliefs are determined by the viewpoint one takes. This holds for Observer Physics and any other theory. Political platforms are really covers for the hidden agendas (i.e. beliefs) of party leaders and at least some of their followers. Religious groups proclaim their beliefs to be Natural Law or the Will of God. This is just a way of asserting that the group's particular beliefs are superior to those of others.

Palmer (**Living Deliberately**, Chapter 9) describes four main types of belief system that he has identified. Let's examine his typology of belief systems.

(1). Type One systems are *a priori*. In type one belief systems one assumes that God, or Nature, or Fate has priorly ordained the way things are and "this is the way it is." There is nothing you can do about it. These belief systems are based on absolutes. You better not disagree with them. The consequences may be unpleasant. *A priori* systems are usually associated with religions and cults. They are disempowering to the individual. One's only hope of survival in an *a priori* system is surrender to an absolute authority that has been "externalized" as a relentless force.

(2). Type Two systems are *a posteriori*. They are established to "handle" an existing situation. Such "expedient" beliefs are based on social conventions. They are defined by mutual agreement of a group and reflect the customs of cultures, and ideas about proper behavior in daily life in order to "get along." Over time they tend to get pretty rigid, but are usually recognized to be expedient, and therefore not written in stone. They can be changed by consensus. Eccentric behavior is not necessarily forbidden.

(3) Type Three systems are empirical and/or deductive. Science is empirical and mathematics is deductive. Empirical systems tend to operate under the transparent belief that physical evidence demonstrates **correctness** of beliefs. Eventually, often under the influence of subtle experience in mathematics, type three believers come to the realization that evidence only demonstrates the **existence** of beliefs and says nothing about correctness. This gradually liberates from the belief in the correctness of beliefs. The history of the liberation of mathematics is a fine example of the gradual discovery that deductive systems are totally arbitrary and subject only to the whim of the system designer. Once a scientist has realized that evidence supports the **existence** of beliefs, rather than their **correctness**, he is able to use the scientific method to uncover and handle transparent beliefs. Once his belief system is free of contradictions and also matches his evidence from experience, (no transparent beliefs), then he tends to spontaneously move into Type Four belief systems..

(4). Type Four systems are deliberate. Rather than designing a deliberate set of beliefs and actions to test a "hypothesis" or establish a discipline of knowledge, one deliberately designs a set of beliefs and actions in order to experience a reality that he would like to experience. With the proper tools for belief management, this program is easily accomplished, so a Type Four believer will tend to change belief systems from time to time and not get stuck in a paradigm. It becomes a paradigm-less paradigm. Once a particular belief set has been experienced fully, he moves on to explore another. The dominant modality of a Type Four believer is exploration.

Type One beliefs are the most rigid, and type four are the most flexible. Each type of belief system has its own value. For example, if you want an environment that is very stable, you choose an *a priori* absolute system and sacrifice personal power. If you want to adapt in various ways without fundamentally changing an existing system, then use an *a posteriori* expedient system and enjoy social compromise. If you want to develop systems of knowledge and application that grow and evolve in great detail, use type three empirical and deductive systems. If you want to explore unknown regions, make new discoveries, and unfold personal power to its fullest and live in the moment, use a deliberate type four Avatar approach.

Each modality has experts who are happy to promote the skills in developing that particular modality of belief. For example, you'll find type three intellectual aficionados in universities, and type one total faith-in-X aficionados in religions. Social and political leaders will be type two aficionados. Most people follow the type one and type two systems as default systems. Pioneers and highly creative self-realized people generally follow type four systems.

There may be other modalities, but this is a pretty good survey. Palmer has developed materials that he calls Avatar. These materials focus on empowering a person to operate in the design and experience of type four beliefs. Interestingly, though, these same tools can work very well for any of the other modalities as well. Just deliberately choose to develop the modality that you prefer and apply the tools.

More and more researchers are coming to recognize the importance of attention. In his recent work, **A New Kind of Science**, Wolfram has noticed that attention is involved in determining the complexity of a situation. He is working toward a definition. With his principle of computational equivalence he seems to believe that the complexity of an organism is defined by the most complex "object" (or set of objects) that the organism can put its attention on. This doesn't really define complexity (or simplicity). But it does comment on **us**, telling us that what we can perceive (and possibly understand) is limited by our attention. Harry Palmer provides practical exercises to develop the power of attention. He also comes pretty close to a good definition of complexity while discussing how simple his "Avatar" approach is. He says that, "something is complex only to the degree that it does not fit with what you already believe." (**ReSurfacing**, p. 5.)

This is a good start at a definition of complexity. The word comes from 'com' (with) and 'plex' (plait, entwine, weave). The idea is that several things are plaited together or parts of a single thing tangled or entwined together. Simplicity, to follow Palmer's reasoning, would be a situation where the objects of experience perfectly fit what you already believe. Thus, experience and belief match. This happens to be Palmer's operational definition of 'truth'. Hence 'truth' is 'simple'. The simplest state of awareness is thus pure truth. This is a good argument for the practical value of techniques like TM or Avatar or any other procedure that gets you into the simplest state of awareness as a base of operations. It's a good foundation for building true systems.

Thus, the range of truth is from the simplest state of awareness where what you see is precisely what you believe and what you believe is precisely what you see, to total complexity in which what you see completely contradicts what you believe, and what you believe totally contradicts what you see. It is no accident that very complex systems or explanations tend to be considered "opaque." This range of truthfulness also gives us a nice operational definition of "precision".

Precision cuts through the crap. When it's simple, there it is. Here it is. It's clear and obvious. Observer Physics aims for truth, clarity, precision, and simplicity. The rest is just playing with the details.

If any of the principles and "discoveries" in this book are shown to be faulty or incomplete, then they will be replaced by corrected and more complete visions. Observer Physics is an evolving discipline and you are welcome to take it wherever you believe it "ought" to go, refining it and extending its range into any dimension you like. It is a "no-limit" creation.

Here are some examples from physics of superb gems of simplicity, profundity, generality, and clarity. Newton and Einstein were masters at seeing things in simple ways.

* $a^2 + b^2 = c^2$.

The Pythagorean theorem for the sides of a right triangle.

* $F_n = F_w - F_b$

Archimedes' Principle: Buoyant force (F_b) on an object equals the weight of fluid displaced by the object. (F_w is weight of object, F_n is net force.)

* $F = m a$.

The force equals the mass times the acceleration. Newton' s second law.

* $-F_a = F_r$

The force of reaction (F_r) equals the force of the action (F_a). Newton' s third law.

* $E = m c^2$.

The energy of a particle equals its rest mass times light speed squared.

We will discover other elegant examples, such as Zel' dovich' s law of phase conjugation, as we go along.

BELIEVE -- (1) To accept as true or real. (2) To credit with veracity.

The word "believe" derives from the Indo-European root *LEUBH, which means to care, desire, love. (See **AHD**.)

The prefix "be-" is an archaic form generally indicating emphasis.

Here are some other examples: becloud, become, bedazzle, bedeck, bedevil, bedew, befall, befriend, befuddle, beget, begin, beguile, behead, behold, belay, belie, belittle, beset, besiege, besmear, besmirch, besprinkle, bestow, bestrew, bethink, betoken, betray, betroth, bewail, beware, bewilder, bewitch