

Applications

In the above discussion, effort has been made to stay close to the understanding of the world that was expressed by Zhuang Zi. It would not be either truthful or desirable to attribute to Zhuang Zi ideas that come from modern science, from any other source not historically linked to him and to his time. On the other hand, Zhuang Zi made many observations that have application today even though the people who know the most about these things would most likely prefer to explain them in terms of their own systems of thought. For instance, Zhuang Zi appears to have known that the blue appearance of the sky is an effect of distance and the amount of air between the light source and the observer. Zhuang Zi probably observed that hills and mountains that appear predominantly green and brown from a short distance appear to become more and more blue the farther from them the observer is located. A modern physicist would probably prefer to give a much more detailed explanation of the matter in terms of Rayleigh scattering.

One of the keynote features of Western thought has been to regard the world as composed of discrete entities, to switch to a particle view of light rather than a wave picture of it. This theoretical preference became almost a necessity of thought when atoms were proven to exist. Zhuang Zi's philosophical position is grounded in the opposite view, one that says that discrete entities are only found as constructs of human thinking, and that the reality is that everything is One. Everything is a single indivisible continuum, and we only take it apart mentally. This Western view was only seriously challenged after Heisenberg made the beginnings of a new quantum mechanics. One of the questions posed by quantum mechanics was whether it was correct to regard light as having the nature of particles or of waves. The first arguments were over whether light should be regarded as consisting of particles that nevertheless has some associated wave characteristics, and it was very soon observed that phenomena once very confidently regarded as particles with mass and all the other characteristics of solid matter would also behave under suitable circumstances as waves and could even be assigned definite frequencies. Then the English physicist, Paul Dirac, showed that it was possible to combine the wave characteristics and the particle characteristics in one mathematical formulation.

One of the characteristics of waves is that those that are not physically terminated in some way (as the vibrations on a guitar string are terminated by physical structures at each end that pin the string to the body of the guitar) will continue to propagate endlessly or until they encounter some physical limitation. For instance, consider a loud musical instrument being played inside a room with a small open round window. The sound that escapes the room will not be heard solely within a projecting imaginary cylinder the size of the hole in the wall. Somebody standing adjacent to the wall and on one side or another of the hole will hear the sound because the compression of air that propagates out from the hole in the wall will compress air directly in front of it but also to all sides. Some of the energy of sound waves will be lost to heat, but a photon that is emitted from a similar hole in the wall does not suffer friction losses and will have its wave expand endlessly through space and time until it delivers its quantum of energy to some electron. The laws of quantum mechanics indicate that the endpoint of this process will most likely be somewhere along a straight line drawn from the photon source through the center of the hole in the wall, but that with less probability it may be found along any other

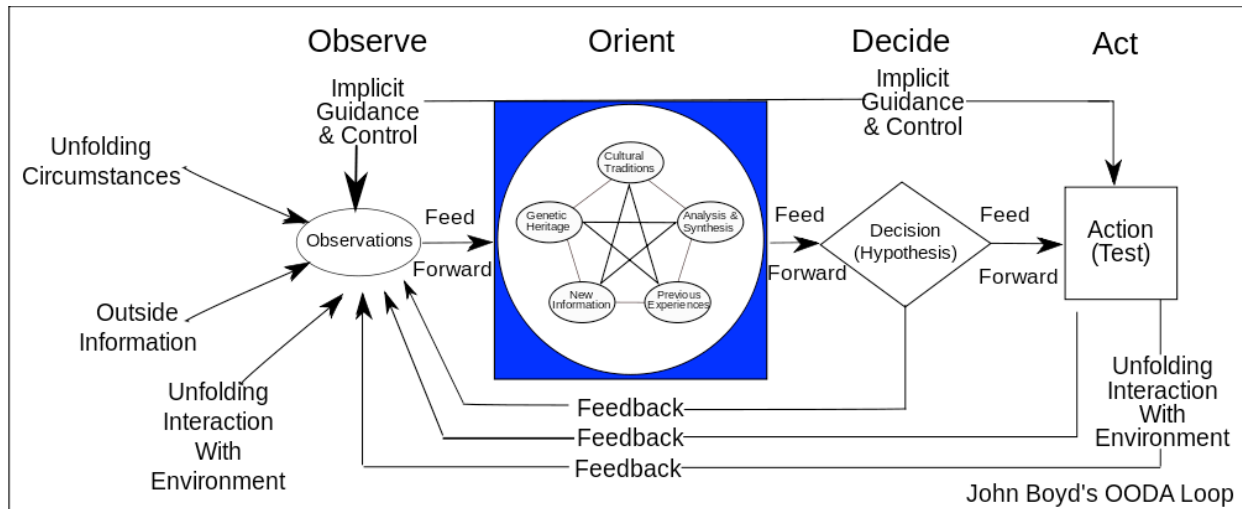
heading. Destinations that are very far from the center will have probabilities that approach but never reach zero. So one way to look at this situation is to draw a probability wave function that is centered as already indicated and that extends to infinity in all directions from that center. One immediate consequence of this picture is that each photon is, during its flight, a process that propagates without having discrete limits.

One way to simplify the picture presented by modern physics would be to suggest that all matter and all energy consists of vibrations or waves, none of which has a cutoff circumference that limits it to being a discrete entity. So, in a rather convoluted way, the course of physics has found its independent way to something more like Zhuang Zi's picture than was classical physics. Everything reaches everywhere, but in different concentrations depending on space and time.

One of the odd results of the Western retreat from its picture of a physical world populated by discrete entities is that certain phenomena such as entanglement emerge and can cause difficulties with our usual ideas about how events that happen in one place in the Universe can influence events in remote parts of the Universe. Zhuang Zi had no idea of these complications to our naive view of the world, nor did he have a similar theory of physics. However, some of the phenomena that are reported in the annals of individuals who practice Daoism or Zen Buddhism might seem more easy to account for than they would be if explanations were required to be consistent with classical physics. These phenomena include reports of what might be called paranormal experiences. Sometimes humans do not even see some phenomena during the time that they could not have explained them, but find the phenomena while exploring the consequences of new theoretical knowledge. A case in point is the 2013 discovery that certain features of the biological processes of plants involve quantum phenomena.

When events move slowly, humans who are burdened with faulty conceptual systems may still be able to muddle through, but when situations change rapidly any dysfunctional or time wasting habits or preconceptions may interfere with success. So it is important for survival purposes to correct our ways of thinking to minimize the probability of failure or destruction.

Combat is an activity that often moves at a very rapid pace. United States Air Force Colonel John Boyd delineated the multiple factors at work when fighter pilots come into conflict. He discovered that the OODA (observe, orient, decide, act cycle) chart of those factors applies more generally. It has been used to discuss sports, business, etc. The time scales appropriate to items mentioned in the OODA Loop diagram can vary considerably depending on the kind of activity being studied.



Take the case of a fighter pilot whose plane is being scrambled in response to a radar image received by a ground station in the Aleutian Islands. Over months or years before the pilot enters his fighter he has been receiving information about aircraft flown in the area by Russia, North Korea, South Korea, China, Japan, et al. When the pilot comes close enough to see the general configuration of the approaching airplane, he will be prepared to try to match what he sees with what he has been taught to recognize. His airbase will be keeping him updated on any new information coming to them through news and intelligence operations. This information will not be nearly as old as the textbook information he has memorized on air forces and their equipment. Then, as he is still at some distance from the approaching plane, he will be paying attention to environmental conditions such as the number of daylight hours still available, the weather, etc.

Because of the flight path of the approaching airplane, the fighter pilot will be attempting to weigh several possibilities in a comparatively unhurried way. It could be a Russian airship that has come from many possible bases, a North Korean plane that had swung far south before turning more directly to the east, a South Korean plane that has come more-or-less directly along its present heading, a Japanese plane that has traveled far north before swinging to the east, a mainland Chinese plane from any number of possible bases, etc. Weather information may suggest reasons why a plane with a certain origin would not have come by a straight line flight. The pilot might have various scenarios in mind to fit the several possible origins and motivations of the approaching plane. The pilot's own education and broader cultural traits may influence what he expects to see and how he expects it to behave. Even the pilot's ethnicity might have some impact on how he would interpret the actions of a pilot with his own ethnicity or with an ethnicity unfriendly to his own.

When visual contact is made with the intruding airplane, the pilot's pace must pick up. Information from ground stations will likely be less pertinent and less up to date than the pilot's own observations. The storm that has been slowly building up in the area will be unlikely to change in intensity very much during the period when combat between the two airplanes is possible, so that information will not be consciously updated for the time being. The outside information provided by the pilot's ground station may have been wrong if the existence of

some kind of aircraft in the general area has been well concealed. The interpretation by the ground station or the pilot of circumstances such as weather may have been made inaccurate due to observer error or faulty interpretation of signs. The pilot may have misread radar or other instruments and may now have to readjust ideas about the plane, the flight path, or other salient factors. More significant error factors will involve the use of deception, e.g., stealth technology, on the part of the approaching plane, and biases in the pilot's observations produced by sense organ shortcomings or, more likely, by learned biases and ungrounded assumptions. The factor called "Implicit Guidance and Control" in Boyd's diagram may result, in extreme cases, in a temporarily active prohibition to the mind to perceive what is actually there. "That looks like a monoplane with about a 250 horsepower engine and it appears to be armed with about a 100 pound air-to-air missile. Impossible!" It is also possible that the intruding pilot has practiced deceptions such as disguising his plane with military capabilities as an unarmed civilian craft. Usually the defending pilot will have many seconds, if not minutes, to unravel these confounding factors.

Once the pilots can see each other, each will have at least a tentative interpretation of who the counterpart is and what the intentions of the counterpart may be. As soon as one pilot makes a decision leading to some action, his counterpart will take account of that action and either maintain a steady course or will respond according to the other pilot's recent action. It is at this point that split second decisions come to the fore.

A dogfight involves sudden death potentialities.

Boyd began his studies by attempting to discover why U.N. pilots in the Korean War so often overcame their opponents despite the MIG fighters being superior planes by most measures. He concluded that the power-assisted steering of the F86 let pilots maneuver even when they were under the heaviest G forces that they had to endure during combat. The MIG fighters depended on flight surfaces that were all operated by direct mechanical connections, with all power coming from the pilots themselves. Under the most extreme conditions of combat they could not exert sufficient force on their plane's control surfaces. The result was that if, for instance, an F86 pilot wanted to turn to the left then he could use his power-assisted flight controls to rapidly force a tight turn. A MIG pilot who wanted to make an equal turn to keep up would be unable to do so and would instead fly a more relaxed curve that would parallel the flight of the F86 on the outside of its circumference.

Boyd generalized this observation of how one turn could be completed within the envelope of a more gentle curve to claim that in general the fighter who could complete the circuit diagrammed in the OODA chart faster would be the one who was in control of a fight. This statement must be regarded as an overgeneralization because the OODA loops are not the simple "Observe, Orient, Decide, Act, Observe..." loop that Boyd's words suggest in this instance. Note that six inputs asynchronously enter into the act of observation, that observations feed forward into the functions by which the individual orients himself, that the five internal components of that process all influence each other, and that asynchronous processes within the orientation stage may produce feed forward signals that enter into the process of decision at random times. One consequence of this fact is that a decision that would have been positive at one moment may be negative at the next simply because in the intervening time new

information has been received from the orientation stage even independent of any new information from the dogfight. Actions are determined not only by the feed forward signals from the decision stage, but also by implicit guidance and control from the orientation stage (which, potentially at least, is always in flux), so that the action taken cannot depend entirely on the decision to act. The observation stage then receives two kinds of signals, one indicating what action has been taken, and another kind of signal pertaining to whether and in what way the action was or was not successful. The observation stage is strangely burdened under some circumstances to deal with the fact that one action was decided upon but another action was performed.

Another way of formulating what Boyd appears to have in mind is to say that an action is best conceived as a complex activity involving observations in the moment, deep levels of personal experience and of learning from others, and, following that, the making of a decision and the complex process (just within the human organism) of implementing that decision in action. The individual who can keep all flows of information moving smoothly and rapidly through the system will have an advantage over the individual who either has relatively slow internal clock cycles, or whose processes conflict with each other, become turbulent, and do not arrive at a definite course of action in a timely way. Circling within the turning radius of another fighter plane can be an analog for making and trying out a decision before one's counterpart can accomplish the same task, resulting in one's counterpart having to react to a new situation before his attempt to deal with the former situation has been completed. In fighter plane combat the ordinary chances for surprise and deception are probably fairly limited. One might imagine new weapons, new detection devices, or even, perhaps, devices intended to blind one's opponent with modern equivalents of smoke or intense beams of light. However, every device would have to earn its portage costs.

In personal combat, the time scale is likely to be different from that of aerial combat. In many cases both combatants will be from the same culture, the same community, or even the same family. So it is less likely that potential fighters will spend very much time learning more about their counterpart's cultural or ethnic characteristics immediately prior to a combat.¹ Ordinarily there will be no more than a few minutes between the time two people see each and the beginning of a fight. When a defender observes the approach of a known attacker or a probable attacker, the defender may very well succeed in avoiding the combat. When a person succeeds in launching an attack upon another individual, the most dangerous situation for the defender may be a sneak attack. In general the timeline leading up to hand-to-hand combat is likely to have a long historical phase in which nothing overt occurs but general information is accumulating, followed by very abrupt onset of action. So the defender in most hand-to-hand

¹ Sometimes lack of accurate cultural expectations on both sides of an interaction can lead to serious trouble. Consider the possible consequences of an encounter between one individual whose culture conditions individuals to be non-confrontational in language and general demeanor but does not impose strong inhibitions on the use of deadly force when one's own life is in danger, and another individual whose culture conditions individuals to use intimidation to achieve social status but limits their use of deadly force to situations in which a counterpart makes the first move. A situation in which the second individual initiates an almost ritual attempt to achieve social domination or at least clarify the social pecking order may lead to a sudden and totally unexpected and deadly knife attack by the "punk" subject of intimidation.

situations is likely to become suddenly aware of being under attack and to find it necessary to take intense action to avoid or answer the attack.

Ideally, a person who is being made the object of an attack will have learned to assess the situations encountered "on the street," and to pick up on a potential attack at the earliest possible moment. Training, both formal and informal, can be very important in this regard. One of the greatest potential weaknesses of a defender is to be blinded to a developing situation by other interests, positive or negative. Distraction can be a potential barrier to total situational awareness. People can learn to deal with potentially distracting thoughts and emotions so that they cannot weaken one's defenses. At this stage of combat the defender is, ideally, already in the trained state of mind that the Daoists and other groups in traditional Chinese culture compared to a mirror that is free of all dust and corrosion so that it always reflects the current state of affairs rather than showing an image degraded by the detritus of old events. It is easy to announce this state to be a desirable outcome of the training of all people and especially of people who may expect to come under attack, but it is not easy to attain this state. A disciplined and well-tempered mind comes only as the product of long preparation. As Lao Zi says, it takes a long time to complete a great utensil. (大器晚成 • Chapter 41.)

At the initial stages of a brewing conflict, the well-prepared defender's mind will be alert, relaxed, and may be going through a checklist assembled through long observation and learning. The defender may be assessing alternate paths, escape routes, places such as dead ends that one should strongly resist being driven into, etc. The defender may notice, as cold hands and cold feet, the physiological signs of preparation for a fight such as blood vessels constricting to reduce loss of blood in case of injury. Zhuang Zi speaks about the desirable mental state to be achieved for this stage when he tells the story of the game cocks that were unperturbed despite the aggressive behavior of other roosters entering their territory. In many of his stories, Zhuang Zi cautions against boastful or arrogant behavior in the face of some degree of external challenge.

In situations wherein the attacker has given forewarning by lurking in a visible location, or has otherwise given the defender a tipoff, the defender has several seconds to prepare mentally, to establish the state of mind that has been carefully nurtured through months and years of various levels of sparring. In other cases, defender's first warning may be a furtive sound to the rear or side or the sight of a weapon being drawn by an approaching stranger only a step or two away.

In the situations wherein the attacker has successfully dissembled, what happens in the defender's mind at the first sign of trouble will be crucial. One untrained reaction, occurring simultaneously with the awareness of fear, could be to retreat. Another untrained reaction might be to cry out. An individual with some degree of training might automatically raise both hands in supplication or in preparation to somehow block a knife thrust. These reactions would all occur in conscious awareness, even though that conscious awareness might not show the desirable characteristic of *mizu no kokoro* (the mind like undisturbed water). The reports of well-trained Japanese swordsmen, occasionally repeated by individuals of later times, show an entirely different and unexpected kind of response to sudden attacks, and a kind of mindfulness

that must be present in individuals of that level of capability even when combat has gone on for a long time.

In characterizing the atypical responses of the best swordsmen, the most often recorded reports say that the swordsman had been minding his own business and suddenly became aware that he had just decapitated an assailant. Depending on the same kind of short-term memory that allows people to "play back" and hear a phone number shouted at them without preamble from their doorway and not originally processed properly at first, the swordsman would then "play back" his memory of the most recent several seconds and become consciously aware that the approaching assailant had been drawing his sword whereupon the swordsman drew his own sword and slew him.

One understanding of such seemingly paranormal events is presented by individuals in the Zen tradition who maintain that the thing we call "mind" and perceive primarily as our mentally holding conversations with ourselves or thinking things out in words in our heads is actually something that has many levels, only the uppermost level being available to us in ordinary times, and only the second level (which we call the subconscious) being revealed to us from time to time as disclosed through unplanned and uncensored utterances and other phenomena frequently called Freudian slips. According to those from the Zen tradition, motivations and even control of the body and the sword can emerge from much deeper levels, and it is control from some deeper level that can direct the body of the swordsman of the highest caliber in times of crisis. At this level of mind, there may not be any barrier between the mind of the assailant and the mind of the intended victim. The intended victim is therefore aware, at the deeper level not available to him consciously, of the impending attack.²

The Zen analysis of this phenomenon is based on the belief that all is one, that there are no truly discrete individuals, and that not all transfer of information goes through sound, light, etc. from one physical body to the next. It is not necessary to accept this way of explaining what happens to be able to accept the fact that something is happening that ordinary experience does not prepare humans to expect or understand.

One current item of interest in psychology is a body of experiments that show that humans decide to do things before they formulate, in internal dialog, the determination to do so. The hand is already making changes preparatory to grabbing the falling egg before the mind says to itself, "Better catch that before it breaks all over the floor," or maybe just, "Grab it!" Some thinkers have argued that if free will means arguing things out with ourselves mentally, reaching a decision, and then acting upon that decision, then humans do not have free will because they are already starting to do something before they make the rationalizations that accompany their doing it. One reaches for the piece of candy before deciding that, just this once, it is o.k. to eat it. These analyses are deficient because they have not investigated the cases where the unconscious impulse to do one thing is countermanded by the discursive processes of mind. "Stop! Don't grab it. That's a yellow jacket, not a house fly!"

² D. T. Suzuki gives many examples of this kind of thing in the teaching stories retold in his *Zen and Japanese Culture*.

One way to account for the "unconscious killing" done by a master swordsman involves looking at the structures of control built into the human body and nervous system. Throughout evolution from the simplest animals to the most complex, nature has been conservative. A device that serves to make the eyes blink, a device that serves to make the heart beat at an appropriate rate, etc. will not be removed and replaced with some kind of direct control from the brain. Instead, simpler systems retain their basic control mechanisms, and the results of operating these mechanisms are reported upward for coordination and control. Breathing is done automatically almost all of the time. Hand motions needed for moving things are mostly out of our awareness unless we experience difficulties in scratching our nose or whatever it was the body set out to do for itself. However, when swimming something has to coordinate breathing with hand motion, head position, etc. One ordinarily sneezes when one needs to sneeze. Conscious control is exerted only when to sneeze would mean to incur some penalty, alert a predator to one's presence, etc. Some things, such as heart rate, can be put under conscious control, but only after a long period of learning.

One very important kind of learning involves moving control of something from the discursive and supervisory part of the mind to the unconscious part of the mind. Learning to swim the Australian crawl, or "free style," involves a rather uncomfortable period during which the learner consciously tries to control breathing so that it occurs during, but only during, the brief periods when the mouth is above water. When racing, swimmers do not want to be involved with consciously monitoring their breathing. The whole swimming process goes on below conscious awareness, and the discursive part of the brain is left free to supervise the factors unique to each race. Touch typing is learned by a rather mechanical process involving memorizing where the home keys are, learning to type their letters automatically, then learning where another subset of keys are located, learning to type their letters automatically, and so forth. A great deal of conscious supervision is devoted to making these actions so well learned that the typist no longer has to think about them. Once one becomes an accomplished touch typist, the only way to recall where a letter is on the keyboard may be to direct oneself to type that character and then observe what one's hand does. The original set of rules learned to facilitate the beginning of the process have been long forgotten.

The beginning training of a martial artist, regardless of whether the goal is swordsmanship, empty-hand fighting, etc, is to train the body to make martial arts movements, blocks and so forth, automatically. The stimulus for a block may be a certain kind of punch directed at a certain point on one's body.

As the learning process continues, the student should develop a repertoire of responses, even many alternative responses, to moves that an attacker may make. The expectation is that the student will need to apply less and less conscious attention to deciding what to do and to the timing of the move. It goes without saying that many of the defensive moves will be accompanied by appropriate follow-through counterattacks.

The accomplished martial artist, then, will have most of what he or she does reduced to the level of automatic responses. However, there is no way to automate initiative.

The Japanese swordsman of the highest caliber is capable of reacting without any delay when a lethal attack against him is initiated. That fact must mean that the discursive processes of mind are not involved. The automatic responses must include assessments that are virtually instantaneous: Is that a sword in my counterpart's hand, or is it a harmless riding crop? Is that murder in his eye, or is it the glint of a practical joker?

The most expert of Japanese swordsmen react without conscious intervention. Their assailants act with conscious intent. The assailant must decide to attack. Recent studies have shown that in gun fights it is the person who gets drawn on who typically fires first. When the contests are controlled for other factors, it seems that only the conscious decision to draw and fire causes defeat.

In the case of attacks with firearms, the quickness of the interaction may hide the fact that the defender acts without conscious decision making. A real gunfight is so intense, and the action over in such a very short time, that the person who makes the killing shot may in many cases not have any clear memory of what happened, and may contrive a "likely story" or convenient narrative to account for what he or she has done, attributing to himself or herself conscious decision-making before firing.³

Back to the issue of training. — What kind of learning experiences made those exceptional Japanese swordsmen able to win out over split-second sneak attacks? The masters in their tradition have some answers to that question. The fundamental steps they would recommend are the same steps that are used in every reputable dojo teaching traditional karate in this century. Part of the content of training, and part of the rationale behind training methods, had to be skipped over in the discussion above. Whatever one does to train the body will also train the mind, and it is best when training is advantageous to the trainee in regard both to body and to mind.

Several kinds of exercises are used in the earliest stages of martial arts training, and I am going to speak of karate from now on because it offers me the most clearcut examples of the salient aspects of the mental side of training.

The first part of early karate training involves principles that are grounded in physics, physiology, and neurophysiology. Students learn how to form a proper fist, how to form a "knife hand" for use in both blocking and striking, what parts of the foot to use in various kicks, etc. They learn how to make the basic motions used in punching, kicking, blocking, etc. They learn several of the most useful stances, and how to move around and turn while maintaining those stances. These things may strike the beginning student as too remote from the fighting and self defense arts that the student wants to learn, but they are fundamental to future progress. In the beginning the student has the immense advantage of having learned nothing wrong. There is, at this point, no hindrance to learning to do things in the correct way. However, once a student has formed and consolidated a bad habit it may be very difficult to reverse this learning. One useful principle is to think of training a student as resembling the way a ball of clay is gradually shaped into a jug, rather than to think of it as being like pouring molten metal into a mold and

³ <http://www.ncbi.nlm.nih.gov/pubmed/8391416/>.

having to accept whatever emerges when the mold is broken. One shapes a student's form by degrees, each time nudging it away from the most extreme forays into the wilderness. Due to the limits established by the teacher, the student is unlikely to settle into one or another rigid and stereotyped way of response. The student's techniques are always in transition.

A second part of early training is to learn a kata or (in Chinese) 拳套 *quán tàò*. A kata is a fight against a number of opponents (usually present only in imagination) that teaches students how to put simple techniques into meaningful sequences of blocks and counterattacks. The period during which or immediately after which I was learning my own first *quán tàò* in Taiwan I had an experience that eludes ordinary modes of explanations, so I put high value on kata for what they do to the mind of the martial artist. However, most if not all students of karate who have grown up in the United States seem to regard kata as a part of an ancient tradition that could perhaps be replaced by something less stereotyped or eliminated altogether. I personally find many of their objections to be aimed at the mistaken picture they have formed of kata, but my views on this matter are of little weight or consequence. I would only request those who want to perfect their characters and to realize their potentials to the fullest extent they can manage that they might revisit the question of what one may gain from practicing kata after they have examined my conclusions regarding mental training. They may at that time objectively study their own combat experiences in the light of my conclusions and accept or reject those conclusions accordingly.

A third part of very early dojo work is a kind of combat training or sparring that is very highly choreographed. It is called "ten-attack sparring." The drill is simple. The class is split into two groups who face each other across a line near one wall of the dojo. The individuals with their backs to the wall make preparations to attack, the teacher gives the count, those with their backs to the wall take one step forward and perform one punch or one kick, and, following suite, those who are facing the wall step backward as they block each attack. After a moment the instructor gives the next count, an attack is met with a defense, and so forth until the tenth attack has been made. After that exchange is finished, the roles are switched, the attackers become the defenders, and another set of ten attacks and ten defenses are made.

Now imagine that you are a beginning student asked to spar, wearing a new white belt, and barely remembering how to make the mechanically simplest block; unbeknownst to you, your mental training has begun. You have lined up against you somebody who is four or five inches taller, twice your weight, exceeds your own reach by at least two inches, has fists half the size of your head, and is wearing a brown belt. Fortunately you remember to step back, but when he makes his attack his fist stops a scant one inch from your nose and chin. (The only reassuring part of the whole thing is that he has told you that his name is Buddy.) Some people may be so lacking in imagination or in the instinct for self preservation that they remain unfazed by this experience. I have never known anyone to totally lose his or her composure under these circumstances. However, I myself failed to maintain a calm and clear awareness of transpiring events. I failed to maintain *mizu no kokoro*, the mind that can reflect what it faces just as a perfectly still pool of water can reflect a clear image. My mind, my mirror, was roiled with some degree of turbulence. In a real fight it would have surely have become very turbulent, and I would scarcely have been aware of what was happening to me. Nevertheless, I survived being

punched at ten times, my next sparring partner was slightly less intimidating, and my brain had begun to grow new connections. My teachers were training my mind.

This kind of unspoken, unexamined, training regimen continues throughout one's karate training. The rigidity of the sparring drill is gradually reduced so that the student can no longer depend on knowing exactly what is going to happen. Eventually one reaches the stage of free sparring wherein rules about non-contact, restricted contact (eyes excluded, primarily), and time limits are the only restrictions. It should be clear that maintaining an unperturbed mind, a non-turbulent *mizu no kokoro*, is a training goal that is reinforced by the possibility of one's opponent scoring points, and even the possibility of unintended injuries being suffered should anyone lose too much control.

I once observed a championship match between Anders Eckmann and Edmund Otis that demonstrated the mental aspects of sparring most clearly. Both gentlemen were students of Sensei Ray Dalke, they trained together regularly, and they clearly knew how each other fought. Neither wanted to give the other an opening by making the first move. Nothing much seemed to happen for several seconds, and then suddenly both men moved almost simultaneously, and then the referee called a point for one of them. Then the same thing happened again. I do not remember who won or how many points were awarded to each. What I do remember was that their clashes were almost entirely mental in the sense that an opening was perceived, one of them initiated an attack, and the other needed to respond to that attack within a tiny fraction of a second. For training future generations of fighters, then, the question would be: What has optimized the reaction times of the fighters who can prevail under these tight conditions?

The answer to how to optimize reactions appears in Eugen Herrigel's *Zen in the Art of Archery*. In that book Herrigel describes how he was taught to let the arrow fire itself. That way of describing the curriculum is paradoxical. Arrows do not really fire themselves. What his teachers intended was that Herrigel would not consciously direct his fingers to release the arrow. The command to fire the arrow was to come, not from the part of Herrigel's mind that engages in inner discourse, but from the part of the mind that does not use language or concepts. Probably the subtext of the theory of archery taught to Herrigel was that the unconscious processing of information in the body is the kind that produces an up to the split second awareness of just where the arrow is pointing, whether the lungs are about to switch from inhaling to exhaling and cause a change in the musculature supporting the bow arm and the arm pulling the string, whether the muscles in the arms are about to tremble, etc., etc., and that it is therefore that part of the entire system that can deliver the best shot. Reliance on the supervisory part of the mind to decide when to release the arrow may degrade performance not only by adding to the time lag involved, but perhaps also by giving range to emotional or other factors that ought not to be given any weight in deciding when to fire.

Herrigel's formulation is a poetic way of characterizing the Zen mind, saying that unconscious forces control the weapon and bypass the supervisory or executive functions normally played by the conscious mind. If a complete beginner were faced with a sudden attack, he or she might do something entirely instantaneous and unpremeditated such as flinging a hot cup of tea into the attacker's face. Doing so would be better than what the beginning swordsmanship student would probably do, e.g., mentally asking, "What technique was it that Sensei said to perform

when...?" The most advanced swordsman will, like the raw beginner, engage in no cogitation but will act immediately. The difference between the two is that only the advanced swordsman will have a well-practiced technique that will flash forth from him automatically. So it is said, "Zen mind, beginner's mind."

The way to achieve the Zen mind was evidently known to Zhuang Zi. He speaks of "forgetting one's Self," and of "sitting in forgetfulness." But the development of a publicly taught methodology for gaining this special mental state reached its peak with the Zen teachers and the swordsmen of Japan.

It is clear that the way toward perfection begins in meditation. There are many ways to follow the path of meditation. Karate training in the United States generally follows the tradition of practicing a minute or so of kneeling meditation at the beginning of class, but very little is usually said about exactly what to do while kneeling with one's eyes closed, nor is very much said about what the specific benefits of this process may be. Some American karateka appear to be hostile to the idea of meditation. I think that they are actively limiting themselves in taking such a position, and that if someone has not found reason to believe that meditation is helpful it would be better simply to ignore the matter. I say that because as long as one is open to it the practice of karate is itself a form of what C. W. Nicol and his teacher have called "moving Zen."

While weak on discussions on meditation itself, the early Daoist philosophers created a background that taught the dangers of egocentric thinking, violence, arrogant self assertion, etc. In many of its teaching stories Daoism gives indications of the kinds of approach to the world that may appear to be powerful and to lead to a glorious life for the individual but are in fact counterproductive. In so doing it lays the groundwork for the ideals of love of humanity and respect for justice that permeates the martial arts tradition in China.

The valuable insights of the early Daoists into the ways that the human mind constructs a "reality" out of the blur of sense impressions offer people of today who may find themselves in combat situations useful instructions. As Master Sun points out, deception and guile are important in combat. Both attacker and defender may at some time attempt to present their counterparts with a custom-crafted vision of reality.

One case in point occurred during a mid twentieth century demonstration match included in a Japan Karate Association video. It shows Gogen Yamaguchi in a match against another karate master. Yamaguchi stepped toward his opponent and launched a rapid pair of punches, left and right, at the head of his opponent. His opponent was forced to block Yamaguchi's right with his left, and Yamaguchi's left with his right. So the defender had both arms raised, and his attention was momentarily arrested at this upper level. Yamaguchi continued, without any pause, to deliver a third attack, a kick into the solar plexus of his opponent. Theoretically the defender could have covered his lower body by drawing one knee up against his abdomen and lower thorax. In practice, the defender was mentally unprepared to see the third attack coming and it struck home.

It is possible to use a bit more artifice to construct a false reality for one's opponent. Consider what it would be like to have an opponent start to kick you with his or her right foot but end up

kicking you with the left foot. The technique depends on a well-practiced ability to bring the lower legs closely together at mid stride, change the supporting leg from left foot to right foot, and follow through the kicking motion using the left foot. The trajectories of a left foot kick and a right foot kick are only a few inches different at the point that a defender will ordinarily block, but the difference is sufficient to weaken the block even if the defender somehow manages not to be mentally taken off balance by this move.

Not many people will go forward in life with the aim of attacking and overthrowing others by using unarmed techniques, knives, or guns. It is far more likely that people will want to prepare themselves in the best possible ways to meet the challenges that matter most to them, and to defend the innocent.

The interests that are exhibited in the *Zhuang Zi* and the *Dao De Jing* fit generally under the title of "philosophy of life." The authors of these books were most concerned about how people could live good lives and not create problems for themselves or others. Their pursuits led them to develop methodologies for correcting misconceptions, prejudices, and, ultimately, for ridding people of delusions. Those who are free of delusions are called the enlightened.

Learning to free oneself from delusions involves mastering techniques that do not always get tested in any direct way. But when one practices martial arts and interacts with others of approximately equal physical gifts, the ability to react only to what is really there becomes essential. Failures to remove inappropriate conceptualizations are penalized by real-world consequences. So sparring with talented people becomes a potent way to advance toward enlightenment.

From very near the beginning time of Chinese philosophy, the *Zhuang Zi* and the *Dao De Jing* were developing and recording insights relative to conflict situations and survival. Misperceiving and misconceiving the world and events occurring in the world can give rise to damaging and even deadly consequences.

The first level of mental development relevant to conflict situations was to use deep relaxation or meditative disciplines to make it possible to perceive accurately and do so in a timely way. Those capable of clear perception will not be likely to underestimate an opponent or to lose total situational awareness.

The second level of mental development relevant to conflict situations led to the ability to operate more rapidly in intense and rapidly evolving conflicts than an unprepared and undisciplined person. When the discursive mind intrudes into such situations it acts as an impediment, an obstacle, to correct action. When someone who has been put into a conflict situation has learned to put the ego and the discursive functions of mind into the background for the duration of intense interactions, he or she will become more able to outperform anyone who may attack. Any lapse in unmediated awareness of an opponent constitutes a 隙 *suki* (lapse or mental break) in one's defenses, and nature will issue a corrective lesson.⁴

⁴ See D. T. Suzuki, *Zen and Japanese Culture*, p. 149.

The third level of mental development is rarely seen. Individuals are sometimes able to react to an attack in operation so rapidly that their non-conscious modes of action deal with the problem before the executive or supervisory functions of mind, which involve the language centers of the brain, the ability to make and use concepts, etc., can come into action.⁵ ⁶ Frequently humans become aware of this kind of unconscious functioning when the supervisory functions of mind spring into action to abort an automatic response that it understands to be inappropriate. When the technique is perceived as being appropriate, people may rationalize their behavior as having occurred as a matter of rational choice.

The lesson for all of us, and particularly for those whose lives and training enhance the possibility of acting out of conscious awareness, is that we are what we have nurtured and corrected ourselves to become. In the moment, one will either be able correctly to assess facial expressions and body language of someone who makes a sudden lunge toward us so that the response is to whatever is actually there, or we may be governed by preconceptions or prejudices that add irrelevant factors such as ethnicity, skin color, etc. to the mix, consequently reacting to something that is not really there.

The Chinese philosopher Mencius, who was a contemporary of Zhuang Zi, said that becoming a good person in the widest sense involves accumulated acts of a highly moral nature.⁷ One does things over and over again, attempting each time to act in a balanced way and do right when having to deal with the real world and its consequences. So one literally grows one's brain into an instrument that is well prepared to evaluate fast-breaking and crucial events.

Zhuang Zi's swimmer (described beginning on page 11) suited his psychosomatic unity to respond most appropriately to the intense interplay of forces experienced when swimming through the rapids. Others nurture their psychosomatic unities to respond to rapid and intense interactions with other humans and with nonhumans.

We are training ourselves in every response we make from birth on. We are being trained by every situation and interaction in which we participate. See the consequences of this fact and respect them.

⁵ See D. T. Suzuki in *Zen Buddhism and Psychoanalysis*, p. 21.

⁶ The 無想劍 *Musōken* or "mindfree sword" of Itō Ittōsai Kagehisa (1560-1653) is evidently the first recorded instance of this kind of unconscious response.

⁷ See the Mencius, chapter 3.