

Introduction

We hear a lot about self-esteem these days, but few have really given it much thought. To have self-esteem we must be able to reach inside, see a new possibility, and allow that inner vision to act upon and change the world we live in. This going within and developing the inner vision and skill to change the outer world is perhaps the most important lesson we will ever learn. We are about to enter the world of pure creativity with Joseph Chilton Pearce. For more than thirty years Joe has challenged audiences around the world by questioning why we, as human beings, haven't developed to our full potential. He is convinced that we have within each of us—hidden in the very cells of our body—capacities and creative potentials we have just begun to understand. Please give your attention to Joe as he explores *Critical and Creative Thinking*.

Joseph Chilton Pearce

Piaget spoke of all development from birth through age fifteen as a slow movement from the concrete to the abstract. He would have been delighted with McLean's triune nature. We move from that which is purely sensory motor, our physical world presented through the reptilian structure, on up until finally we are in the realm of pure thought itself. And of course, that's what the whole first fifteen years are about, to move into a realm of objective pure thought. Concrete operational thinking opened at about age seven; formal operational thinking opens about age eleven. I'm using Piaget's terms, even though they have to be qualified.

Critical thinking really comes in when formal operations unfold. All of a sudden, all things are not equally valid; children see lots of things as absolutely not valid and rightfully so. A sense of righteousness and justice and a set of high ideals begin to manifest in the child's mind. Where do these come from? They simply arrive full-blown with this age because the highest evolutionary structure of the mind is now being focused on for development. It's always been active, but now we're going to develop it fully. Piaget spoke of our ability at this point to operate on the brain's own functions. We have been operating on the physical world, now we move into a realm where we can actually operate on our own processes of thought, which means the processes of the brain itself.

We have spoken of how the self-system has moved out of its embedment in the lower processes; now we can say we are embedded in the higher processes? Well, not exactly. How could we operate on these higher processes if we were simply embedded in them? We have to have some kind of an objective stance.

Sir John Eccles, a Nobel Laureate in brain research, claims that the true seed of mind, mature mind, is in the cerebellum, a three structure in the back of the brain. Though the brain we are speaking of is very ancient, it doesn't start forming until the end of the first year, after which point its growth is very rapid. This immediately follows object constancy—the stabilizing of the visual process—which is followed by walking, talking, and so forth. A whole new behavioral block opens up. This is the beginning of the cerebellum's growth, which then unfolds rapidly until it has completed itself and taken over the process of movement and so on. But it's far more than that; Eccles hypothesized that one of the parallel processes of is actually the seed of mind itself.

Strangely enough, the cerebellum has a cellular structure totally different from the rest of the brain: though the reptilian brain, the limbic structure, and the high structure stretch into the cerebellum, it has what are known as granular cells in place of their neurons, an estimated three or four trillion of them. And it gets three times the number of signals that it sends out. That is, three times more stuff comes in than goes out. It doesn't have to do much to direct the whole system, apparently—if it is indeed the seed of mind—but it has to have everything coming in.

At any rate, around age eleven several things happen. We have discussed how at eighteen months of age the toddler has as many neural fields available as an adult, how the neurons are connected with as many other neurons—upwards of 10,000 each—in the forming of these fields, and that the pool from which these potential fields are drawn numbers 100 billion neurons. We've seen that at age seven we have five to seven times more neurons than we had at eighteen months but then something happens that returns us to the same amount we had at eighteen months by adulthood.

Well, what is it? The most recent research I've seen states that at around age eleven the brain releases a chemical which dissolves all un-myelinated and undeveloped, non-utilized neural structures.

Now understand, each neuron is potentially connected with some 10,000 others directly and indirectly with millions of others, forming different fields that can operate on many different levels at the same time. So, if one set of connections is removed, a whole other set of connections might be perfectly intact; one aspect of a neural field might be removed because it hasn't been developed, but other aspects of it will remain the same.

So we have the neuron count probably stable while the dendrite and axon count changes dramatically. And that's what probably happens at age eleven: dendrites and axons and possibly even glial cells are removed. I haven't come across any research into it, but there is a marvelous reduction of the neural weight of the brain at and we come into a period of absolute clarity.

What's happening? The eleven or twelve-year-old does not believe that any and all things are equally valid. They don't think that all things are equally possible. They could not follow a model in anything and everything. What would be the limitation? Well, the neural fields that are left solid and stable and intact are those that have been developing throughout this entire time. That apparently is what happens. So they no longer have an infinitely open structure; the system has pretty well closed according to the culture in which that child was brought up. And is this point of closure of possibility destructive? No. The house simply has to be brought to order. You couldn't teach chemistry or mathematics or anything else in the higher sense to a child who believes everything is equally valid—they are just not going to be able to understand the restrictiveness of the system, how exclusive it is. So we bring the house to order and then the child is ready for a culture's body of knowledge.

We were talking about child play, and the difference between child play from seven to eleven—as Bettelheim said—is that in a win/lose situation, the seven to eleven-year-old wants to win. If put in a rigid situation, children will cheat if they can, because all that counts is winning: all things being equally valid, winning is certainly equal to losing and I'm going to win. Now at age eleven, suddenly, we become painfully aware of rules and regulations, and justice and rightness. And the difference lies in the fact that we have cleaned up the house and brought it to order.

The child can deal with the structure of knowledge. Why bring it to order? Instead of the wide open play and make believe where everything changes all the time—fluid, relaxed, a lot of fun—the young person becomes very much involved in rigid rules and regulations. I talked about how out on the sandlot we spend half our time arguing: you're not being fair, I was out, you were not, and so on and so forth, hammering out our giving up of the absolute freedom we had on behalf of a social group. This is how a social group organizes and manages to get along together.

We are preparing for what? Well, we have got about three or four years before puberty, before the opening of genital sexuality, when we can actually father children.

Can you think of anything on earth that requires more self-restraint than parenting? Self-restraint, self-sacrifice, giving up one's own entirely self-centered good on behalf of the good of another. That's parenting. And to prepare for that, what do we have? We bring the house to order. And the person undergoes willful self-restraint on behalf of the rules and regulations of a larger order.

We find that we are about ready to enter into the mainstream of society as functioning social members. Nature provides for this; we now have created an intermediary state, which we call adolescence, which really never existed before. You were a child up to a certain point, you underwent certain rights of passage, and you took your place in the adult world, for which all your childhood had prepared you. Now we have adolescence. And adolescence has grown, moving deeper and deeper into childhood. Children become adolescents earlier and earlier and stay adolescents longer and longer. Now they are even living with their parents until they are thirty and so on. Adolescence is kind of an arbitrary dumping ground for people we are not ready for our society. But nature is still preparing for socialization and parenting at this point.

So, we look at a society's body of knowledge. What is a society's body of knowledge? Every society on earth—the Aborigine, Eskimo Laplanders, South American tribes, whatever it may be—has a body of knowledge, and it's at around age eleven that the child is initiated into it. At that point childhood begins to wind up and come to an end and preparations are made for children to become full members of the society.

All societal bodies of knowledge fall into the same three categories, which is quite interesting. Again, I'm fitting everything into my pattern, the way Freudians fit everything into the categories of Id, Ego, and Superego. These follow the triune nature of the brain.

All societies have a body of knowledge which consists of three things. The first will deal with the physical world, the actual mechanics of the physical world. In our society that ends up as science and technology and perhaps certain crafts; all the practical technologies for dealing with the physical world. You won't find any society on earth that doesn't have an inherited body of knowledge, one passed down through the ages to deal with the physical world for the well being of all in the most economical fashion. And that is, of course, dealing with the reptilian system, our primary world/physical body system.

The body of knowledge's second category will always be art. Now art, in its broadest possible sense, is simply the language of the emotional cognitive system. It's the language of relationship. It's the language of feeling, of that deepest core of being me as distinct from everything else. It speaks of the experience of being me and how I relate to the whole life experience. Art is the language of the limbic system, the language of the emotional cognitive system. And if you think about it, you will see how perfectly that is true.

I remember David Bohm, the great physicist lately departed, saying that music was pure, subtle energy. Subtle energy. He said that music was the subtle world, in effect, expressing itself in the physical world, and I really think that proves itself to be true when we look at the art forms of other nations, and peoples. The Australian Aborigine art form is astonishing. In all of the world's art forms we find expressions of the feeling capacity; the affective expression of life.

And then finally, the third stage, moving on up, what do we have? The realm of meaning. Meaning in its purest abstract form. We stand back, look at everything objectively, and we say, what the dickens is it all about? Meaning. This expresses itself as our philosophies and our religions. At around age eleven, a child simply spontaneously becomes religious in some fashion. Generally, they want to become religious in an organized, formal way. And they will immediately polarize things. This is a great age of polarization. We don't understand this: it's either right or it's wrong. And let's be perfectly clear about it, it's either just or it's unjust, it's righteous or it's unrighteous, you are either fair or you're not, and so on. The child sees everything in clear blacks and whites. They are a perfect example of the old classical, logical truth tables, either A or not A and you can't have it both ways. That's this age, beautifully.

And the need for a philosophical, religious basis of meaning that's applicable to this age is critical, serious one. My friend Gene *Schwartz, who's with the Waldorf School in Spring Valley, teaches sixth grade. He said, "We talk about God because children seriously need the subject of God during that period. And of course in this day and age, this is politically incorrect and, not only that, illegal. But ours is a private school system, so we relax."

This need of a religious or philosophical frame of reference is simply the need for meaning. David Bohm said, "The brain really operates and functions by meaning. It can't operate in a vacuum that is meaningless to it." We were speaking awhile ago, and someone came up and said, "I have an attention deficit."

Well, my daughter has a *serious* deficit of attention unless she likes the subject and can entrain. In this period meaning becomes critically important to the child. And that's the expression of the third and highest structure of the mind, as it reflects back on the whole process, which is its physical process. It's, "what is the philosophy for meaning in this physical world at this time?" We need a meaning for it. That's our religious impulse at this time, a meaning for physical life. It's still directed toward this. The whole first fifteen years is directed toward gaining and stabilizing our dominion over our physical world.

So from this standpoint we find that to make the focal point of education the production of scientific, technological minds and geniuses requires a system that must—apparently to maintain its own integrity—deny meaning. Well, deny meaning and you are going to have to have difficulties. Nevertheless, at age eleven the young person is ready to adopt a culture's body of knowledge and at this point formal abstract education can begin. I insist that were the child given the appropriate foundations through each of the developmental periods leading up to the house-ordering that occurs at about age eleven and were then, for the first time, exposed to a culture's body of knowledge on an abstract semantic kind of level, they could polish it off in no time at all.

Now, someone—like myself—who struggled through eighteen years of schooling being prepared for something that has never yet happened will find the idea that a twelve-year-old can be introduced to the culture's body of knowledge and have it polished off by fifteen kind of insulting. But there have been examples of exactly that happening. Why? Because all the rest of the stages were fully met and they entered into the experience complete. But if we try to do that ahead of time we are going to have a lot of trouble because the foundation won't be there.

The next aspect of this is semantic language, which appears at age eleven. It's important for us to realize the difference between concrete language and semantic language. Certainly, a language of abstract meaning starts becoming available somewhere around age seven, when we first begin to leave concrete language and move toward semantic language. And we are in kind of mixture between the two during the seven to eleven period in which everything is equally possible and true. But at age eleven, semantic language appears. What's the difference? All of our physical sciences, technologies, philosophies, religions, and everything like that, depend entirely on semantic language. All of it simply a semantic or abstract proposition.

You remember that we spoke about the pointing syndrome in the earliest child: the child points, looks back, and asks what is that mama, what is that daddy, asks for a word to label a thing. That word is not a label of the thing. It's not an adjunct to it. It's an integral part of the neural structure and all the connections of the neural field involved in that structure of knowledge. It's an integral part of that whole thing, not something separate from it. So that when you fire in the word, the toddler or child responds with the thing in some way. Ask them to say sit down and they'll try to sit down if they say it. Ask them to say the word hand and they'll move their hand as they say it.

If you give them a word in the absence of the thing, the word, as a vibration, comes in and triggers the very same neural field that was triggered by the thing itself and the child comes up with a reasonable facsimile or reconstruction of the thing, but only in their mind's eye; it's not present to the sensory system, but created within, thereby raising the whole aspect of the inner world, the inner image, metaphoric/symbolic, thinking that we went through before. This is its foundation.

At age seven we start the shift from word and thing being a single, integrated unit carried to a great extent in the right hemisphere, toward word separated from any necessity of a corresponding thingness. This is what we call abstract language or a language of pure meaning. And by age eleven the brain has completed the construction of a language of pure meaning—largely centered in the left hemisphere—by drawing on and cooperating with the right hemisphere. At this point a word doesn't have to refer to anything other than its own self.

The word referring to itself; self-referring. Take such a word as beauty: is beauty a thing? There is no way. And the righteousness that the eleven-year-old is so concerned of, where is it? Is righteousness a thing? No. It's a quality or a state, as are care, empathy, sympathy, compassion, and love. All of these are not things. There is not an object in the world that can represent them. They represent nothing, other than their own meaning. We are now dealing with a language of states of being or a language of qualities of being. All of our higher levels of thoughts and learning have to do with words that are self-referring, even the true, metaphoric, symbolic structures that we deal with. Remember the earliest child's imagination, representing the spool as the great road roller or the little clothes pin as the doll, and so on, metaphoric thinking where one object stands for another.

Let's go back to Einstein's famous equation. We say this stands for energy. What is energy? Where is the thingness? No, it's a state. It's a state of potential. It's a possible force. What is equality? Where is the thingness for equality? There is no thingness of equality. It's a state of mind. It's a possibility, and so on. Mass of energy. Well, we know it's all pure metaphor. Physics is metaphor and so on. The mass of a particle. That's just a mathematical concept. The speed of light. No such thing, you see, as such. Squared. All pure concepts, abstract concepts.

Generally, a child should not be expected to arrive at this point before age eleven. There are exceptions: I've heard third graders at the Hunter Day School in New York City, where they have some of the most precocious children on earth, who could make the hair rise up on you, sitting around discussing very abstract concepts. Well, they simply have arrived at this stage a little bit earlier. The fourth grade is really about when you start hitting this ability to think in abstract concepts nowadays, and the fifth grader should be fully into it. In summation, the culture's body of knowledge is largely based on semantic language, a language of meaning, and that appears about age eleven.

Again you see the critical need to follow nature's agenda and honor each stage with what is appropriate to the child at that point. When that is given, then you hit them with the whole abstract concept and they'll be able to grasp it and move right on into it.

My little friends and I would lie around on the sidewalk on a summer evening—the skies were very clear back then—and look at the constellations and it would frighten us. It would terrify us. We would get this terrible feeling that we were going to fall up into that whole space. And we would talk about space and the concept that space never ended, which would drive us up a wall. Over and over again. “But it has to end somewhere, it can't keep going forever.” “But if it ended, what would be on the other side?” And our world would crash down; it was more than we could bear, a terrifying thing. If space ended, what would be on the other side? How could it go on forever? At age eleven you're ready to move into the world of abstract ideas and thought, ready for science and technology, but not before.

Now I would like to talk about our tendency toward chauvinism and the assumption that ours is the first age of real thinkers that has ever existed. Every age has thought that. I remember coming across a translation of an eighth century Sanskrit scholar.

He was talking about the illusions of the mind and he used as his example the sun passing across the sky, how the naive assume that the sun is moving about the earth. Whereas, of course we know that the earth moves about the sun. Eighth century. But we in the west assume that the heliocentric notion dawned on us in the great age of enlightenment, when we first began to move out of the darkness of our minds and become mentally alive in the 16th, 17th, and 18th centuries. And so we find that lots of people have had high periods and peaks of civilization before us.

I like to shift momentarily and mention a few things about formal operational thinking acting on physical objects. We come to Baalbek in the Lebanese mountains, in very harsh mountainous terrain. Baalbek means “the home of Baal.” Baal was the rival of Jehovah in the Old Testament, one of the most powerful gods of the east. In this city there, they find evidence, right now there are mosques built on Roman temples, which were built on Aegean temples, which were built by tearing down even earlier religious structures, and so it goes.

Now a huge stone substructure has been found at Baalbek. The under-course stones are perfect rectangles, fitting together so perfectly that you can barely detect their joints—and these stones are approximately thirty-three feet long, ten feet wide, and twelve feet deep. British engineers who have studied this in depth study say they weigh about 750 tons each.

The Egyptians used stones that were a maximum, average weight of two and a half tons to build the pyramids, and we marvel at how they could have moved them around. And the stones at Baalbek are 750 tons—the Egyptians were using playthings, baby toys compared to these. Now, the funny thing about it is, you have a whole under-course of these stones that fit together so perfectly it can hardly be detected where one begins and another ends. Superimposed on top of them is a second set of stones that are, for some reason or another, much larger: sixty-five by ten by fourteen and weighing an estimated average of over 1000 tons. And in what apparently would be the front of the structure’s facade there is a big hole. One whole stone is missing.

The missing stone would have been sixty-six feet, strangely enough, by the other dimensions. They found the quarry for this about a five-minute drive away, over very rough mountainous terrain, with no sign of a roadbed at all. And in the quarry they found where every stone was quarried out, apparently in its perfectly cut, not shaped afterwards. And they also found the sixty-six foot long stone cut on three sides with the fourth side started before the building project was interrupted. That particular hole had been filled in with thousands and thousands of little stones by some later people to complete the basic foundational structure.

How, the British engineers wondered, did they get the stone from one point to the other? They found no road bed. We know that if they used rollers, which would be the obvious way to do it and how most ancient people moved stones, it would have taken a very deep roadbed of stone to support two million pounds of concentric weight in one spot. The British engineers estimated it would take 40,000 adult males to move one stone anyway, regardless. And how would you organize 40,000 adults around a sixty-six foot long stone? They found one single, tiny hole drilled through the center of each stone, larger on the inside than on the outside. And they have no idea what it's for.

The funny thing is, all the archaeologists looking at the structure believe that it is antediluvian, built before the time of the great flood. They estimate its age to be between 20,000 and 30,000 years. So, between 20,000 and 30,000 years ago somebody knew how to move stuff around in ways that we can't. All the engineers agreed that we have no technology today for the moving of such structures without all sorts of preparation.

All I'm saying is, once this structure forms, it's going to start functioning. And it formed a long time ago. And there have probably been peaks of very high civilizations that have disappeared overnight. Leslie White, the great cultural anthropologist, said that great cultures and civilizations have appeared and disappeared in a cyclic wave from the beginning of time and that great cultures always disappear by their own hand. They kind of commit suicide, it seems, in one way or another.

Now I mention this simply to show that the possibilities of using formal operational thinking in a concrete operational way are literally open-ended; infinite possibilities are available to us. I don't mean to spend so much time on esoterica, but it's worth taking a look at the esoteric subject that Robert John and other physicists have been investigating— telekinesis, moving objects without touching them.

This is essentially savant-like performance because the individual himself never knows when it's going to happen and cannot direct it. It happens *through* them but not *by* them, rather like the savant who can give an answer but can't generate it himself. You have to furnish the stimulus, the response simply comes through him. Same thing with what we know now.

There is a possibility that there have been ages on earth in which this capacity was developed to a high level. We simply have to recognize this; the evidence is all too clear. By the way, the Australian Aborigine seems to have moved over to Australia with his dream-time cosmology and many strange capacities intact, somewhere between 40,000 and 50,000 years ago. The idea that we moved out of the primitive stage of no-thinking into the preliminary stages of thinking only about 8,000 or 9,000 years ago is a lot of nonsense.

There is a higher state of formal operational thinking within our own system; I'm going to talk about the really great peaks of scientific and creative thinking that have occurred. We refer to these as the *eureka experience*. The eureka experience contains a very strong element of the savant syndrome, as you'll discover when you study it further. Lots of people have written on this: Jerome Brunner wrote on it, Peter McKellar wrote on it, loads of people have written on the eureka experience and it's absolutely fascinating. I will give a brief example.

*Gordon Gould was awarded the Nobel for discovery of the laser in 1957—note, *discovery* of the laser, not invention of it. And by his account of the event, he was just doing nothing on a weekend, when suddenly the whole concept of the laser appeared in his mind as a single flash. Boom, here it came, the entire thing. And he was stunned, electrified. He was overwhelmed by the enormity, the magnitude of the single image that hit him in that split second. He spent the rest of the weekend writing madly, trying to get all of the implications and ramifications down on paper, trying to spell out all that he saw in that one split instant. And it was something that had never existed before in history. Some things do not exist in the whole universe except as we bring them about by ordering reality in a certain way; the laser was one of those. He spent the whole rest of the weekend writing about it. And then eventually we have the laser, which lies at the base of an enormous amount of what's happening in present-day technology.

Let's look at the eureka process itself. We find generally this pattern follows. Gordon Gould questioned where the idea came from—it was totally new and he was unprepared for it. He didn't expect it; it was a bolt from the blue. On reflection, he realized that he had spent years and years studying physics and optics, and then twenty years working with physics and optics, and the optics of physics and so forth. For all those years he had been feeding information to the hopper of my mind, all the bricks and mortar of the magnificent edifice that was suddenly presented to him. But where did it come from? His mind? No, it *breaks into* his mind. But from where? He doesn't know and neither does anyone else, really.

Look again at the eureka process as it ordinarily unfolds. First there must be a seizing by a possibility; a passionate seizure. Generally, the scientist suddenly sees and is entrained by a possibility and begins a single-minded drive attain it. This is the filling in of the details; the search for materials needed to realize the possibility. This might take years and years, as he goes through the entire body of knowledge and every possibility that can be rigged up or invented looking for the materials that might give him the content for his vision to become real. Finally he/she will exhaust the source of possibilities. Many times nothing comes from this. A period of exhaustion of possibility on a plateau of stagnation comes in.

All possibilities are exhausted; it doesn't work. We can't get the content to make the possibility real. At some point in this stagnation the individual either quits or temporarily tries to get away from the whole thing. And at that moment of clearing the decks, when the mind is no longer involved and least expecting it, the answer arrives out of the blue, catching the individual totally by surprise.

Furthermore, the answer, when it arrives, generally bears no resemblance to any of the materials searched for and gathered throughout all those years. Then why was the search necessary? Why have to go through all that preparation if the final answer gives birth to the possibility in a way that the individual could never have dreamed of? To prepare the soil of the mind to receive the answer and translate the answer into the common domain. Because the answer always arrives in a symbolic, metaphoric form. Did Gould see lasers and all their possibilities? No. He saw this blinding image of possibility fulfilled. He then had to translate what he saw in that single instance into the common language of physics and objects.

So there's the clearing of the decks, the arrival of the answer out of the blue, and then the final most critical point, the translation of that answer into the common domain. That took him all weekend and then there were years of work after that before the laser became an actual reality.

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