I believe that to develop a comprehensive and articulated theory of mind, we are going to have to return to the personal introspectional and observational methodologies of the classic psychologists: James, Freud, Jung, and Adler. As things stand. I think that the best observational human psychologists are the devisers of fiction—novelists, poets, and playwrights. I am none of these myself, but I am a connoisseur and critic and unbridled consumer of fiction, and my understanding of the patterns of human thought owes more to my reading (and viewing) of fictional constructs, than to the formal study of psychology, or to my paltry personal experience. And although, I am able to supplement my vicarious experiences with a certain talent for introspection and an ability to construct creative analytical syntheses of relevant scientific findings and theories, I have over the decades merely dabbled with the theory of mind, waiting and hoping in vain for someone else to take up the problem in a more systematic way.

I have always been greatly interested in what makes animals tick. I am especially interested in the way their minds work, and in the way their minds interact with their emotions. Humans, of course, have the most complex and interesting animal minds, but since the study of mind (as opposed to brain) is still in its infancy, there is some sense in focusing first on less complicated minds in our quest for understanding. Presently, I intend to further narrow this inquiry to the scope of what I will call animal intuition.

Since we have by now almost 100 years of what Arthur Koestler dubbed "ratomorphic psychology" experiments as data,[1] this oughtn't to be too formidable an undertaking, but if anyone has systematically synthesized this data, and all the later data that has been gathered in college psych labs since at least the early 1960s, into a comprehensive model of the animal mind, I am unaware of it. The brain scientists, on the other hand, with the help of fMRI, have been making great strides in mapping even the higher-order human functions onto the brain, but they are unlikely to be able to make further progress until they have a comprehensive theory of mind to work with, and I am not holding my breath.

Koestler also promoted the tripartite brain model of Dr. Paul MacLean. Although MacLean's model of the human brain as a layered and imperfectly integrated kludge of three different brain-minds, doesn't seem to have inspired much effectual theorizing either, there can't be any serious controversy about it as a structural model since it is rooted firmly in anatomy. At any rate, the tripartite brain remains my working structural model for the substrate of the mind of the higher animals, including humans.

MacLean's tripartite brain consists of three discrete, though interlinked brains layered by evolution one on top of the other, and each with its own "executive area". At the base of this structure is the self-sufficient reptilian brain, which is fully capable of processing most forms of sensory input, and directing the body appropriately in response. Our reptilian brain even has its own visual system, called "blindsight" because it affords even the totally blind a kind of unconscious, subterranean visual system. Many of the simple decisions regarding the regulation of the body and the organism as a whole are made at this level, even in humans, and in recent decades the reptilian brain structures have been credited with ever more impressive forms of self-sufficient intelligence.

At the next level we encounter the animal brain per se, which even in rudimentary form has some higher-order cortical projection areas, and which also contains all the basic structures for integrating sensory data into meaningful patterns, and laying down these patterns into organized long-term

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[1] *The Ghost in the Machine* (1967), 15-19. Koestler's witty coinage refers to the psychologists' indefatigable experimentation on rats and other small creatures as proxies for the human brain and mind, inspired by the simplistic behaviourist models of Pavlov, Skinner, etc.

memory. The animal brain, with its executive area located collectively in the limbic system, is fully capable of thinking in all the important practical senses of the term, and it is from the animal brain that we obtain the gut feelings, intuitions, and judgements that more often than not provide us with better guidance for life's complex decisions than our easily confounded rational, or analytical brain.

Esse Homo

Finally we come to the celebrated higher faculties, which have their own executive areas in the frontal cortex. It is with the aid of these higher brain structures that all of mankind's most distinctive and remarkable achievements are born, yet it seems evident that most people are more befuddled and misled by these higher faculties, than wisely guided. And even when their higher faculties are operating smoothly and in full cry, they are apt to be displaced summarily at any time by the more urgent imperatives of the emotion-driven animal brain. As Koestler and many others have noted (and modern brain scientists have confirmed) the judgmental faculties of the animal and of the higher brain are only very imperfectly integrated and co-ordinated, so that it often seems that we are divided from our real selves---by which we really mean: alienated from our, most essential, animal selves.

I believe that for most people, most of the time, and for all people essentially, it is the emotion-fueled animal brain that is our driver, and that it is also usually our best navigator as well. The higher faculties, and in particular the frontal lobes with their transcendent executive functions, contribute our senses of self and self-awareness, our facility with abstractions (much more developed in some people than in others), and our sense (or illusion?) of self-directedness, but I think that it is still the animal brain, and mind, which is mostly in control. The majority of our abstract beliefs and principals are derived from others—hand-me-downs from our culture—and there are further tailored or interpreted to coincide with our particular animal wants and needs of the moment, and amount, most of the time, to little more than rationalizations for self-interested behavior.

And if the human animal has been uniquely capable of sporadic high-order achievements in thought, in art, and in the construction and maintenance of complex societies, more typically the individual human (unlike all other animals) falls far short of his potential, and is all too ready to submerge his individual mind and judgement in malevolent acts of collective insanity. The major purpose of Koestler's classic, The Ghost in the Machine, is to account for man's unique perversity.

The Role of Love in the Animal Brain

Fortunately, as animals, even humans are potentially redeemed by love, and the possibility of love. There are many kinds and definitions of love, but the kind I have in mind here is a generalized benevolence that I believe arises from a saturation and spillover of self-love, and becomes transcendent, though still directed by the self to particular objects. I believe that it is from this kind of love, which depends crucially on a sense of empathy, that all human goodness flows.

I think that the one thing all religions worthy of the name have in common is, not a belief in God or gods, but a disposition to somehow promote love in this sense I've defined it here, though for many religions, love is evidently rather low on the agenda. St. Paul is supposed to have said:

> And though I have the gift of prophecy, and understand all mysteries, and all knowledge: and though I have all faith ... without charity I am nothing.
>
> . . . . .
>
> And now abideth faith, hope, charity, these three: but the greatest of these is charity.
>
> 1 Corinthians 13:2, 13

Thus, the King James Bible. But the word "charity", usually understood as succoring the poor, has been more accurately (though more vaguely) translated as "love" in more modern texts.

The original text for 1st Corinthians was in Greek, and word that was translated "charity" in the King James version of the bible was agápe. A current Wiki article on the meaning of various Greek words for love says that agápe

> means "love" (unconditional love) in modern day Greek, such as in the term s'agapo, which means "I love you". In Ancient Greek, it often refers to a general affection or deeper sense of "true love" rather than the attraction suggested by "eros". Agape is used in the biblical passage known as the "love chapter", 1 Corinthians 13, and is described there and throughout the New Testament as sacrificial love. Agape is also used in ancient texts to denote feelings for a good meal, one's children, and the feelings for a spouse. It can be described as the feeling of being content or holding one in high regard.

Note first, that the modern sense of agápe as unconditional love is not an attribute of the ancient sense. And as for agápe as "sacrificial love", hopefully, the author of the above definition is a better Greek etymologist than a parser of the bible, because in the only other passage in the "love chapter" to deal with the self-sacrificial alms giving that Paul presumably approved of (and that most Christian churches make much of), indeed the very next verse after 13:2, Paul takes pains precisely to distinguish agápe from alms giving, and from other sorts of self-sacrificial activity:

"And though I bestow all my good to feed the poor, and though I give my body to be burned, and have not charity, it profiteth me nothing." {1 Corinthians 13:3}

Agápe is a feeling of benevolence and has nothing essential to do with helping the poor, or with self-sacrifice. Like Portia's mercy, it is not to be bestowed, but should drop unbidden "as a gentle rain from the heavens". And in view of the other senses of agápe found in ancient texts ("feelings for a good meal, one's children ... of being content or holding one in high regard"), it is best understood as overflowing benevolence in search of some worthy object cherished by the self. Thus the related admonition, "charity [agápe] begins at home", fits best with my view that feelings of benevolence arise from the spillover of self-love to the creatures and things that one is disposed to love: the members of one's family, good music, learning for learning's sake, one's close friends, good neighbors, a bit of melodious birdsong outside one's window.

It has long been fashionable in ethology (the scientific and objective study of animal behavior) to attribute animal love to instinct, but I, for one, see no essential difference between the love of a dog or cat for the members of its family (including the human members) and the human love that stands as a saving antidote to uniquely human evil and perversity. I believe that it is this sort of love that represents the good and valuable part of all religions—and of all animals.

The quest for feelings of pleasure, including love in both it's benevolent and erotic senses, is the mainspring of the animal brain and of the human mind that it drives, and if this weren't so even for humans (the most intelligent animals, taken as a species), our remote ancestors would never have climbed down out of the trees to play, to investigate, and to develop the tools (and the brain) to pursue their loves in ever-expanding and ever more inventive ways.

Unfortunately, with the massive programming and indoctrination we are all subjected to, it is all too easy to lose sight of this fundamental truth of each of our lives, and many, if not most, humans have done so, some irrevocably.

Love, of course, is not a mode of cognition, but it is, I think, the overarching organizing principle of the animal brain, and the chief mover of animal behavior, once the basic drives have been assuaged.

Sublimation and the Unconscious

These were originally Freudian concepts but I have my own take on them. Like self-consciousness, they seem to be emergent features of the higher animal brain.

I believe, in part from my own introspective experience, that Freud's view of sublimation, though positive on the whole, was a bit warped. He considered sublimation as essentially a faculty of adaptation to society, but I see sublimation as essentially am integrative projection of the mind and heart. If an individual is the sort to be deeply enmeshed in his particular social nexus, or is a true believer in some cause, then his sublimations will serve social adaptive purposes, but if he is a lone artist or thinker, they will simply provide him with a focused channel for the exercise of his mind integrated with his spillover love.

The unconscious, I believe, is simply the normal mode of thought for the animal brain. However, it functions differently when the animal is awake and its activities are partially orchestrated by the spotlight of consciousness, and when it is asleep and dreaming. In the latter state, the unconscious busies itself in its own idiosyncratic way with the integration of the fleeting thoughts and emotions of the preceding day, and days, or even with exploring the themes of a lifetime. However, I don't intend to get into the fascinating subject of dream or other alpha rhythm states here.

When a cat suddenly finds itself in a novel environment it begins a process of exploration guided by intuition and past experience, and in fairly short order, and with the assistance of no conscious analytical process, it will find itself mentally prepared to make good decisions about how to get on with its life.

Humans rely no less on this very same ability. We are prompted at every turn by intimations from the integrative unconscious, which supplies us with both motivations, and the ideas for achieving them. The conscious analytical faculties are brought into play only occasionally, to help sort out the little complexities that our unconscious intuitive mind can't simply see the answer to.

Thus, even on the cognitive side, I think that our animal mind is our most sophisticated intellectual faculty, although it is so interwoven with, and amplified by, the cortical structures with which it is connected, that it is these higher faculties, whose use demands conscious attention, that we assume are in control. Yet even the idiot savant, whose amazing feats must depend in some way on our higher (cortical) faculties, evidently relies on unconscious processes, because he is unable to provide a conscious analytical description of the workings of his mind. This is because he lacks intuition, which may be defined in this context as the ability to bring appropriate contexts to bear. The idiot savant calculator simply lives in a world of numbers and timetables and his activities bear little practical relationship to his welfare.

The key cognitive concept here is: context. All our understandings, whether conscious or unconscious, depend on context, and layers of context—though most people are quite limited in the number of contexts they can bring to bear simultaneously.

The creative artist has an especially intimacy with, and trust for, the products of his unconscious, but I'm not going to follow that interesting train of thought here. Instead, I want to continue my argument that even our highest purely cognitive faculties, and man's most impressive accomplishments, necessarily rely primarily on the unconscious, and our liaison with it: the intuition.

My paradigm case is the 1997 chess match between then World Chess Champion Gary Kasparov and "Deep Blue", a sophisticated computer program fine-tuned by a chess Grandmaster, and run on a custom built IBM supercomputer. Although Kasparov lost two games to the computer, and won only one, with three draws, thus losing the match, the wonder is that he wasn't soundly beaten in every game. Deep Blue was able to evaluate 200 million positions every second, and to routinely look forward twenty to thirty moves, and even after adjusting for Kasparov's encyclopedic memory of

positions, his deep experience in evaluating them, and his genius, we must concede that the computer was at least many millions of times faster in its calculating speed. How then did Kasparov avoid defeat most of the time?

The answer is that the highest faculty of the human mind isn't calculation or any kind of analytical, rational process. Its highest faculties lie in the integrations and insights of the unconscious mind, and these fruits emerge in the form of intuitions—for example, the intuition of a cat surprised by a novel and menacing predator who makes an instant and usually correct decision whether to attack or flee, or perhaps to just relax. Or the process that guides an abandoned stray to choose the very best family in a strange neighborhood to feed and succor him (cats are notorious for this ability).

Although far, far, below the level of a Kasparov, I have played many games of chess at my own maximum level of intensity, and I do have a certain introspective talent that I believe gives me a bit of insight into the mystery of how Kasparov kept up with Deep Blue. In particular, for several years I played in a by-mail tournament against players of about my level of ability, where one had, in theory, almost unlimited time to study the board and work out one's next move (this was before chess-playing PCs were available). Thus, one could sit and stare at the board for hours, and work out all the permutations for many moves in advance, and I did—but it wasn't enough.

It's not just that to find the very best move would have required the calculation of many thousands of additional permutations that would have taken weeks and months. The real limitation is that one's mental faculties become overloaded and blow a fuse. One can overcome the limitations of the human mind up to a point by various techniques,[2] but sooner or later one inevitably reaches the limits of one's comprehensive mental capacity. At that point the question of which of several equally plausible moves to make can be resolved in one of two ways: either one can construct some sort of clever, but artificial rationale, or meta-argument, for a particular move, or one can rely on blind intuition. Needless to say, it is nearly always blind intuition that provides the best guidance.

Gary Kasparov's superiority to all of his human contemporaries was based in large part on his chess knowledge and experience, on the profundity of his grasp of many thousands of characteristic positions, and on his supreme self-confidence and character, but in the end, most of his best games were the fruit of his superior intuition, which remains mysterious.

If, in the end, so much of our thought process didn't lie below the surface of consciousness, it would be possible to analyze it, and reduces it to an algorithm, or a procedure, or a computer program, and this has been done for many complex mental activities, but not the ones that stretch even the best human minds.

This chess paradigm is utterly typical of the way the human mind works at its best, when it is up against its inherent limitations. Sometimes the limitations are merely severe time constraints that leave no time for conscious analysis, but such situations make the role of intuition even clearer. As it happens the strongest chess grandmasters in regular tournament play also tend also to be the best lightning chess players, playing whole games within a one- or two-minute time frame.

Malcom Gladwell has illustrated this mysterious animal ability that we call intuition in many areas in his book, *Blink: the power of thinking without thinking* (2005), showing over and over that our most profound and impressive mental feats are typically based, not on a process of conscious reasoning, but

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[2] It's known that the human mind can contemplate no more than 5-10 elements at once, depending on IQ. Analysis in general helps break a too-complex problem down into manageable chunks, each of which can be then worked out in some detail, then bundled and labeled as a single unit of mentation. This can then be juggled with a half a dozen or so others as one contemplates the best solution to the whole. The problem with this approach is that, depending on the whole that one is dealing with, it may not be possible to fractionate it cleanly, so the analyzed chunks may remain interdependent.

on the same faculties that a cat or a mouse relies on to survive in the wild. Indeed, there are examples in the Gladwell book in which the correct, intuitive, choice is made even in the face of weighty evidence and analytical arguments to the contrary. Such cases, however, are the exception, and in fact it may be argued that such contra-rational intuitions can only emerge in minds so well-developed by the rational analysis of extensive experience that they are prepared to spot the occasional exception that proves a new rule.

What is intuition, anyway? Since it operates for the most part below the level of consciousness this is an almost impossible question to answer at present, but one thing I know is that its validity and effectiveness is a function of the well-prepared mind—an ongoing work of construction that is the product of all the reading, conversing, thinking, and analyzing that one has done over a lifetime. It is said that experience is the best teacher, but it is those with questing active minds who suck the marrow out of experience, continually finding small novelties while the rest are just deepening their ruts.