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ULLIN T. PLACE

Two Concepts of Consciousness: The Biological/Private and the Linguistic/Social[1]

How much of our own mental life should we attribute to animals, given that they do not communicate by means of natural language? The paper examines the positions taken by Aristotle, Descartes, Darwin, the post-Darwinians, the behaviourists down to Skinner, and contemporary philosophers such as Davidson and Fodor. A distinction is drawn between two concepts of consciousness: the biological/private which we should not hesitate to attribute to all warm-blooded vertebrates and the linguistic/social which is exclusively human.

Introduction: the problem of animal mentality

How much of the mental life which we attribute to ourselves and our fellow human beings should we ascribe to other creatures, particularly those mammals to whom we are most closely related in evolutionary terms, given that such creatures do not communicate with one another by means of anything resembling human natural language?

This is a question which, in one form or another, has been debated by philosophers since classical times and, more recently, by biologists and psychologists. In the past the issue has been a largely academic one with no serious ethical or political implications. Pet owners have been happy to insist on a total community between their own mental life and that of their pets - "he can almost talk, you know" - while living in amity with butchers and blood sports enthusiasts who are equally concerned to minimize the mental community between themselves and their victims. Today, with advent of the animal rights movement, the issue of animal mentality has become a major focus of ethical and political debate. I shall not, however, address the issue as to whether it is or is not appropriate to ascribe rights to animals in this paper. Instead I shall focus on the narrower issue of how far the psychological predicates which occur in natural language commit us to linguistic competence on the part of the creatures of whom they are predicated. What implications, if any,

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[1] This paper was originally conceived as an unsolicited response to an Inaugural Lecture entitled 'From Conditioning to Consciousness: The Cultural Origins of Mind' presented to the University College of North Wales, Bangor, by my colleague, Professor C. Fergus Lowe on 29th November 1989 (Lowe 1992). It was first presented to the Slovenian Philosophical Society, Ljubljana, 24th September 1990.

the conclusions I shall draw on that topic have for the issue of animal rights I shall leave for you to decide.

Aristotle and the abstraction of universals

This question has a long history. To my knowledge, the earliest surviving discussion of it within the Western philosophical tradition, and the one which dominated philosophical thinking on the issue down to the 17th century, is Aristotle's treatment of the matter in the treatise usually known by its Latin title, *De Anima*, 'Concerning the Soul' (Aristotle, 1941, pp.535-625). The concept of the soul which Aristotle expounds in this treatise is one which he shares with all his philosophical predecessors, including Plato. Its origins are lost in the mists of primitive magico-religious belief. It is the concept of the soul as the vital principle whose presence is a necessary and sufficient condition for a living organism to be alive and whose absence is a necessary and sufficient condition for it to be dead. This is the principle which is invoked by Plato in the *Phaedo* (105C-E, Plato, 1953, pp.162-3) when he argues that since the presence of the soul is that which distinguishes the living from the non-living, it makes no sense to suppose that the soul itself dies. Hence, the soul must be immortal.

This Platonic argument for the immortality of the soul rests on the concealed and unargued assumption that the soul is what Aristotle calls 'a substance' [(ουσία)], an independently existing entity which preserves its identity over time by its continuous occupation of a bounded volume of space. It assumes that the soul is a distinct entity which enters the body at the moment of conception and leaves it for some other place at the moment of death. Aristotle avoids this piece of Platonic sophistry by proposing that the soul be thought of, not as a substance, but as the *form* of the substance (the body) which it animates. He compares it to the shape of a bronze statue, an organizational property which the bronze acquires when it is poured into the mould and which vanishes without leaving a trace once the statue is melted down.

Nevertheless, the idea that the soul, *qua* form of the body, is the principle whose presence distinguishes the living from the dead permeates the whole of Aristotle's doctrine as laid out in the *De Anima*. Starting from this premise, Aristotle drew the conclusion that all living things, vegetable as well as animal, possess souls so long as they are alive. However, the functions that distinguish the living from the non-living are different for different kinds of living organism. That, for Aristotle, meant that different kinds of organism had different kinds of soul. In all living organisms, plants as well as animals, being alive involves some kind of metabolic process whereby the integrity of the system is maintained over time. This is attributed by Aristotle to the presence of what he calls a 'vegetative[' or 'nutritive] soul.' But, in addition to this vegetative soul which they share with plants, animals also possess a 'sensitive soul' which, so long as it persists, gives them the ability to move their limbs and their whole bodies in response to the stimulation of their sense organs. There is also a third soul in the Aristotelian scheme which is peculiar to human beings. This is [the thinking soul or *nous*,] the '*intellectus agens*' or active intellect of Scholastic Philosophy, the rational soul or mind. It is the presence of this soul that gives to human beings the capacity for thought and language which, according to Aristotle, no animal possesses. The reason why animals lack these capacities, he thought, is that they lack the all-important ability to abstract universals or concepts from sensory

encounters with particulars that instantiate them. "Brutes abstract not",[2] as Locke (1690/1961), following Aristotle in this as in many other aspects of his philosophy, was to say some two thousand years later.

Thanks to contemporary psychological research, we now know that Aristotle and Locke were quite simply mistaken in claiming that an animal is incapable of learning to abstract universals from sensory encounters with their instances, if by that is meant acquiring the ability to generalize what it has learned in one situation to other situations of the same kind without generalizing inappropriately to similar situations of other kinds.

Experimental evidence ~~of an animal's ability to generalize its responding from an initial learning situation to other similar situations has been available since the phenomenon was first demonstrated by Pavlov (1927) in his classical studies of the "conditioned reflex" in the dog. However, evidence that an animal can learn to generalize and discriminate in a manner which corresponds to the boundaries between the different kinds of object and situation which it encounters in its environment has been slow appear. The story begins with~~ [that an animal can learn to abstract universals from encounters with their instances comes from] Lashley's (1938) pioneer studies of pattern discrimination learning in the rat~~.~~[,] ~~It is carried forward by~~ [from] Herrnstein, Loveland and Cable (1976) who showed that pigeons could be taught to distinguish photographic slides of scenes containing such features as a tree, water or a particular human individual from slides of otherwise similar scenes without those features~~. It is completed only very~~ [, and most] recently~~, by~~ [from] Pearce's (1988; 1989) studies of the acquisition of artificial categories, also in the pigeon. [There is also evidence cited by Paul Churchland in his (1988) Revised Edition of *Matter and Consciousness* which demonstrates learning to abstract universals from sensory encounters with their instances, by means of what is essentially the same process of trial-and-error-correction, in the case of a connectionist network on board a submarine learning to distinguish mines from rocks on the seabed by their sonar echoes.]

From this evidence we must conclude, I believe, not only that animals possess rational souls in Aristotle's sense; but so does a connectionist network. This is not, of course, to claim that animals have the power of language. It is simply to claim that at least one important feature of mentality, the

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[2] These are not, in fact, Locke's own words. They come from a headline added by A. S. Pringle-Patterson to Paragraph 10 of Book II, Chapter 11 of his *Locke's Essay Concerning the Human Understanding* (1924). However, the headline aptly and succinctly summarizes both the content and flavor of the paragraph. The complete paragraph reads:

> "10. If it may be doubted whether *beasts* compound and enlarge their *ideas* that way to any degree: this, I think, I may be positive in, that the power of *abstracting* is not at all in them; and that the having of general *ideas* is that which puts a perfect distinction betwixt man and brutes, and is an excellency which the faculties of brutes do by no means attain to. For it is evident we observe no footsteps in them of making use of general signs for universal *ideas*; from which we have reason to imagine that they have not the faculty of abstracting, or making general *ideas*, since they have no use of words or any other general signs." (Locke 1706/1961, Vol.I, p.126)

ability to abstract universals from their instantiations in particulars is not peculiarly human. Its possession is no doubt a *necessary* condition for the development of linguistic competence, but it is clearly not sufficient.[3]

Descartes and the *res cogitans*

After Aristotle the first significant turning point in the development of the theory of animal mentality is in the work of Descartes. As I see the matter, Descartes' contribution to the theory of mentality in general and of animal mentality in particular stems from a consideration of the implications of the new mechanical physiology, initiated by Galileo, for the traditional concept of the soul as the vital principle. Descartes was himself both an advocate and active practitioner of the new physiology. Indeed he proposed a theory of the function of the heart which was no less mechanical and which made the heart no less central to the functioning of the body than was that of his contemporary and rival Harvey to whom we now ascribe the `discovery' of the principle of the circulation of the blood. It just so happens that Harvey got it right, while Descartes got it wrong. Descartes thought of the heart as a kind of steam engine. Harvey saw it for what it is, a pump.

Descartes realized that once you have a conception of the body as a self-sustaining mechanical system, there is no longer any need for a concept of the soul as the vital principle whose presence explains the persistence of life and whose departure explains the phenomenon of death. Death is simply the breakdown of a mechanical system. He also saw, as his scholastic predecessors had failed to acknowledge, that Aristotle's concept of the soul as the form of a substance is not the kind of entity which would be able survive the death of the body in the way required by Christian doctrine, at least, in its mediaeval form in which prayers are said and indulgences bought for the welfare of the souls in Purgatory.[4] Concerned as he was to reconcile his Christian beliefs with his equally profound commitment to the Galilean scientific revolution and the new mechanical physiology, he was looking for a way of defending a strong doctrine of the soul, a doctrine of the soul in which it could be conceived as a substance existing independently of the body whose death

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[3] Recent experimental research within the behaviour analytic tradition on the phenomenon of stimulus equivalence on the matching-to-sample task (Sidman and Tailby 1982) is showing that the acquisition of linguistic competence by the child is associated with a significant change in and extension of the ability to abstract universals from encounters with their instances. However, the most recent evidence (Dugdale and Lowe 1990) suggests that this phenomenon is a *consequence* of the child's acquisition of linguistic competence, specifically the acquisition of the ability to name objects, rather than a cause, as the Aristotle/Locke view requires.

[4] [The Schoolmen relied on a passage in Aristotle's *De Anima* (Bk. III, Ch 5, 430ª22-5, Aristotle, 1941, p. 592) in which he claims that, unlike the other kinds of soul which he distinguishes, including the passive intellect which mediates sense perception, the active intellect is capable of existing independently of the body and is immortal. Aristotle, however, gives no very persuasive argument for making this rather obvious concession to the Platonic conception of the soul as an independently existing substance.]

it could be supposed to survive, but whose existence and functions were not being invoked, as the souls of Plato and Aristotle were, to *explain* the difference between the living organism and the corpse.

However unsympathetic one may be to Cartesian dualism, one cannot but marvel at the ingenuity of Descartes' solution to this problem (Descartes, 1642/1954). By representing the existence of the thinking 'I' as far more certain than that of the external world, including the thinker's body (which forms part of that world from the thinker's subjective perspective), Descartes constructs a concept of two kinds of independently existing substance: a *mental* or *spiritual substance* whose essence or individuating principle is its continuous awareness of its own thought processes over time and a *physical substance* or *body* whose essence or individuating principle is its extension, its occupation of a unique volume of three dimensional space over time.

Having carved up the organism into two radically different kinds of substance, the one in space, the other outside it, Descartes was faced with two difficult problems

(1) how to construe the relationship between the two substances and
(2) what functions to assign to the spiritual substance or soul that could not equally well be performed by the mechanical system which he believed the body to be.

I shall not discuss Descartes' account of the mind-body relation and the problems it encounters in this paper. With regard to the second question, Descartes saw no reason why a mechanical explanation should not be given for all those functions which Aristotle had attributed to his vegetative and sensitive souls. As is well known, it was Descartes who first proposed a mechanical explanation of the behavioural functions which Aristotle had attributed to the sensitive soul in terms of the reflection of animal spirits from input to output within the central nervous system. Since animals cannot talk, they give no evidence of the kind of self-consciousness of their own private thoughts and experiences on which Descartes' argument for the independent existence of the thinking 'I' depends. He therefore concludes with Aristotle that this rational thinking and talking soul or 'mind', as we now say, is the exclusive preserve of human beings. But since this is the only kind of soul that Descartes recognizes, it follows that animals, along with plants are simply mechanical systems which require no soul, no vital principle, to explain their distinctive properties as living organisms.

Nevertheless, the similarity between Descartes' position and Aristotle's is only skin deep. Descartes agrees with Aristotle in restricting the mental to human beings and in giving the fact that only humans can speak and interpret language as evidence for that restriction. But the conception of the mind that emerges is very different from that of Aristotle. For one thing, the ability to abstract universals from encounters with their instances which is central to Aristotle's account is not mentioned by Descartes. He doesn't discuss the problem of universals specifically, but one gathers from his endorsement of the doctrine of innate ideas and the use that he makes of the Platonic argument for that position in his version of the cosmological argument for the existence of God

(Meditation III), that he favours the Platonic/nativist position on this issue and rejects the Aristotelian empiricist/abstractionist alternative. Instead of the rational soul distinguished by its ability to abstract universals from particulars, Descartes' *res cogitans* or thinking substance consists in a continuous sequence of thoughts and experiences whose occurrence is known only to its owner and which is known to others only by virtue of their owner's verbal reports. This change in the conception of the nature of the mental is most striking in the case of sensations. Sensations for Plato belong to the body, not the soul. For Aristotle they belong to the sensitive soul that human beings share with other animal species. For Descartes they are private experiences, part of the data to which only the immortal soul has access. Animals respond to stimulation in the way that an automaton responds; but they experience no sensation, no pleasure, no pain. The fact that they display all the behavioural signs which go with such experiences in the case of human beings, apart from their expression in language, is not allowed to count against the theory.

From Darwin to Behaviourism

After Descartes, the next major milestone in the history of conceptions of animal mentality is the Darwinian theory of evolution by variation and natural selection. Now for the first time the pendulum swings in the opposite direction from that favoured by Aristotle and Descartes towards a recognizing a continuity between human mentality and the mentality of animals. The process was begun by Darwin himself in his *Expression of the Emotions in Animals and Men* (1872). It was continued by one of his more enthusiastic followers, G. J. Romanes, who in 1882 published a book of anecdotes which he had obtained from the general public by writing letters to the press asking readers to send him evidence of intelligence and ingenuity in animals of whatever species other than our own. The lengths to which Romanes and his informants were prepared to go in attributing complex human mental processes to species quite far removed from *homo sapiens* on the evolutionary scale caused the inevitable backlash in the form of Lloyd Morgan's canon. The canon promulgated in 1894 is a version of Ockham's razor - *entia non sunt multiplicanda praeter necessitatem* - entities are not to be multiplied beyond necessity - applied to the postulation of mental processes and states invoked to explain the behaviour of animals. To quote Lloyd Morgan's own words:

> In no case may we interpret an action as the outcome of the exercise of a higher psychical faculty, if it can be interpreted as the outcome of the exercise of one which stands lower in the psychological scale.

Four years after its promulgation, Lloyd Morgan's canon was applied with devastating effect by E.L. Thorndike to the interpretation of his epoch-making experiments on cats learning to escape from a puzzle box, first published in 1898. Thorndike's initial application of Lloyd Morgan's canon led him to the conclusion that in giving an account of the process of random trial and error by which his cats

gradually got better and better at getting out of the puzzle box and getting at the food placed outside it, the only mental processes he needed to invoke were the visual, auditory, olfactory and kinaesthetic sensations associated with the various features of the box, its surroundings, and the cat's own movements in relation to it, and the emotions of "satisfaction" that accompanied release from the box and access to the food and of "discomfort" that accompanied each unsuccessful attempt to escape.

In 1911 the original monograph was reprinted with supplementary material and discussion in the form of his book *Animal Intelligence*. By this time, Thorndike had been compelled by his more behaviouristically oriented colleagues in the growing field of comparative psychology to agree that even this very limited concession in the direction of animal mentality was not demanded by the experimental evidence. One could eliminate all mention of sensations by talking about external and internal stimuli. One could likewise define "a satisfying state of affairs", as he did in the 1911 book, as "one which the animal does nothing to avoid, often doing such things as attain and preserve it", while "a discomforting or annoying state of affairs is ... one which the animal commonly avoids and abandons." (Thorndike 1911, p. 245)

Although Thorndike never regarded himself as a behaviourist, it is clear that the effect of this 1911 re-interpretation was to open the door to the behaviourist movement which was officially launched two years later in 1913 by J. B. Watson's paper in *Psychological Review* 'Psychology as a behaviourist views it.'

Behaviourism, as a movement within psychology, has its roots in comparative psychology. In the first decade of this century comparative psychologists were becoming increasingly frustrated by the insistence of the psychological establishment of the day that their scientific objective was to study the mental processes of animals when the very existence of those processes could not be established by direct observation. It could only be inferred on the basis of an analogy with the mental processes reported by human subjects when they perform tasks similar to those being performed by the animal whose mental processes were under investigation. What the behaviourists wanted to assert was their right to study the behaviour of animals and explain that behaviour in whatever way seemed the best and most economical in the light of the objective facts of that behaviour and without regard to any speculations as to what mental processes and mental states might be involved.

However, as good Darwinians, the behaviourists also wanted to insist on the essential continuity between animal and human behaviour. Consequently, in denying a role to mentality in the explanation of animal behaviour, they were also led to deny any role for mental states and processes in the explanation and causation of human behaviour. What they could not and did not deny was the evidence of the occurrence of mental processes and the existence of mental states which is provided by the introspective self-reports of human subjects.

Their attitude to this introspective evidence has always been ambivalent. On the one hand, there is the so-called methodological behaviourism which accepts introspection as providing evidence of mentality, but refuses to accept such evidence as admissible for the purposes of scientific

theory construction. On the other hand there is the late B. F. Skinner's so-called "radical behaviorism." Skinner accepts both the existence of what he calls "private events" and that "verbal reports" provide scientifically acceptable evidence of their occurrence. But he tends to minimize the role of such events in the explanation and causation of behaviour.

Skinner and the linguistic/social concept of consciousness

There is, however, one form of mental process which has been allowed to play a conspicuous role in behaviourist theories of the determination of human behaviour since the days of Watson and Pavlov and that is the process of thinking construed as talking sub-vocally to oneself, using what Pavlov (1938) called 'the second signalling system', human natural language. Although they accepted the existence and causal efficacy of verbal thinking, American behaviourists, down to and including Skinner's 1953 book *Science and Human Behavior*, tended to minimize the differences between human and animal behaviour due to the fact that human beings are linguistically competent, whereas animals are not. Russian psychologists such as Luria (1961) and Vygotsky (1962), on the other hand, have taken their cue from Pavlov and stressed the dramatic scale of the difference which is made by the human possession of the ability to use language both for the purposes of interpersonal communication and in controlling one's own behaviour by the process of thinking.

Towards the end of his life, Skinner too began to emphasize the gulf that the possession of language makes between animal and human behaviour. This trend in his thinking first appeared in 1966 with the publication of his crucial paper 'An operant analysis of problem solving.'[5] The theme of the paper is the distinction which he draws between "*contingency-shaped*" and "*rule-governed behavior*." According to Skinner, all behaviour is a matter of adaptation to the contingencies which operate in the environment of the behaving organism. A contingency, in his sense, is a three term causal relation represented by the acronym ABC. Under certain *Antecedent* conditions, *Behaving* in a certain way, including not doing something, has or is liable to have certain *Consequences*, including, of course, the so-called `non-contingent' consequence where you do something and nothing happens.[6] In animals, pre-linguistic children and in the case of the habits and skills, both motor and verbal, of older children and adults, this adaptation is secured by the process of contingency-shaping. Contingency-shaping takes two forms depending on whether the behavioural

[5] This paper was reprinted as Chapter 6 of *Contingencies of Reinforcement* (Skinner 1969) and most recently, with peer commentary, in *Selection of Behavior: the Operant Behaviorism of B. F. Skinner* (Catania and Harnad 1988).

[6] Despite having introduced the concept of 'contingencies of punishment' in *Schedules of Reinforcement* (Ferster and Skinner, 1957), Skinner continued right up until his death to define the "three-term contingency" as the relationship between "a stimulus, a response and reinforcement." Although he is reluctant (personal communication) to take the credit for it, my own adoption of the `antecedent-behaviour-consequence' formulation comes from Professor Ogden Lindsley of the University of Kansas. See his Lindsley (1964).

disposition in question is innate or learned. In the case of unlearned innate behaviour, behavioural dispositions are selected by the effect on the genetic constitution of the species to which the individual belongs of what Skinner (1975) calls "the contingencies of survival", in other words, by the processes of variation and natural selection described by Darwin. In the case of learned behaviour contingency-shaping takes the form of the process of trial-and-error-correction which we have already encountered in Thorndike's (1898) cats learning to escape from the puzzle box, Lashley's (1938) rats abstracting triangularity when learning to discriminate triangles from crosses on the Lashley jumping stand, Herrnstein *et al.*'s (1976) pigeons in the Skinner Box abstracting scenes containing trees, water and a particular human individual, and Churchland's (1988) connectionist network learning to discriminate [the sonar echoes characteristic of] mines ~~and~~ [from those characteristic of] rocks.

[By contrast,] rule-governed behaviour ~~by contrast~~ is the kind of behaviour which ~~occurs~~ [ensues] when a linguistically competent human child or adult is confronted by a problem situation in which it has no ready-made solution based on its existing contingency-shaped habits and skills. In these circumstances the behaviour of the agent comes under the control of a verbal formula which Skinner calls "a rule". A rule for Skinner consists in the self-directed utterance of a verbal formula which describes or, as he puts it, "specifies" a contingency.

Such rules, it turns out, are of two kinds: ‘prescriptive rules’ and ‘descriptive rules’.

(1) A *prescriptive rule* is a conditional imperative such as *If the baby cries, give it a bottle*. Such rules specify an Antecedent condition and the Behaviour to be performed under that condition; they differ from simple imperatives like *Shut the door* in that they are not acted on immediately, but have to be `taken to heart', as the saying goes, and re-issued by the agent in the form of a self-directed imperative, as and when the relevant Antecedent condition occurs.

(2) A *descriptive rule* is a conditional declarative sentence like, for example, *if you give the baby a bottle it will go back to sleep*. Such rules specify some Behaviour which the listener might consider performing and the Consequences to be expected from so doing; such rules correspond to the `means-end beliefs' of philosophical action theory, a number of which are liable to occur, in the form of self-directed thoughts, as part of the process of deciding what to do in a problem situation.

~~Skinner himself does not draw this distinction between prescriptive and descriptive rules; but since he introduces the distinction in the context of problem solving, it is evident, once the distinction is drawn, that it is primarily descriptive rules or means-end beliefs that he has in mind. Had he drawn the distinction and considered the case of behaviour controlled by a prescriptive rule he might have emphasized more than he does the verbal behaviour of other speakers as a source of many of the rules that control this form of human behaviour. As it is, he concentrates almost entirely on the case where the rules are generated by the agent herself.~~

[In contrasting rule-governed and contingency-shaped behaviour, as well as in linking rule-governed behaviour to behaviour controlled by means-end beliefs, it is important, I believe, to draw a distinction which Skinner himself does not draw between rule-governed behaviour proper and what we may call "rule-initiated behaviour." By "rule-initiated behaviour" I understand the behaviour which occurs in a problem situation as a direct response to an actual thought, to the self-directed utterance of a verbally formulated hypothesis as to the nature of the prevailing contingency. "Rule-governed behaviour," in the strict sense of that term, would then be a form of contingency-shaped behaviour which develops, if and when the original rule-hypothesis is confirmed by the subsequent encounter with the actual contingency. Although essential to its original statement in the organism's behavioural repertoire, the verbal formulation of the rule gradually drops out as the actual contingencies take over and the behaviour becomes habitual and thus contingency-shaped. Such behaviour is rule-governed only in the sense that rules play an essential role in its initiation in the first place and in any subsequent modification that may be required when circumstances change.]

~~Although rule-governed behaviour in this sense~~ [Rule-initiated behaviour] is much slower and much less fluent than contingency-shaped behaviour~~. But~~[,] it has the very great advantage that it is not restricted, as is ~~contingency-shaped behaviour from the outset,~~ [behaviour that is contingency-shaped] to what the individual has inherited through its genetic constitution or has learned from past experience of the contingencies in question. By formulating its own past experience of the contingencies in language, ~~it~~ [a linguistically competent human] is able to combine that knowledge both with prescriptions for action derived from others and information from the same source about contingencies which would otherwise be totally inaccessible. By building up from both sources a stock of such verbally formulated means-end beliefs whose reliability has been validated by their effectiveness as guides to action, the individual is in a position to receive reinforcement for supplying information to others and can thus participate in the process whereby there is a constant interchange of information between the *Eigenwelt*, the individual's stock of verbally formulated beliefs about the world and what Binswanger (1947) calls the "*Mitwelt*", the stock of verbally formulated beliefs about the world which is the shared property of a linguistic community.

Although he is reluctant to use the terms ‘mind’ and ‘mental’, Skinner does use the term ‘consciousness’, not, it is true, in connection with his account of rule-governed behaviour, but in his account of the so-called "private events" reported by the introspecting subject. Such ‘consciousness’, he insists, is a product of contingencies imposed on the individual by the verbal community. As he puts it in ‘Behaviorism at fifty’ (Skinner 1963)

> It is not ... seeing our friend which raises the question of conscious content but `seeing that we are seeing him.' There are no natural contingencies for such behaviour. We learn to see that we are seeing only because a verbal community arranges for us to do so."

or in *About Behaviorism* (Skinner 1974 p. 153)

> It requires a special verbal environment to impose consciousness on behaviour by inducing a person to respond to his own body while he is behaving.

In another passage from *About Behaviorism* (*op. cit.* p. 154) Skinner recognizes the common thread which connects this conception of consciousness as something that is shared and communicated within a verbal community with the Marxist conception of consciousness[7] as the sense of identity shared by a social class. He writes:

> Marx and others have tried to 'throw people into a higher level of consciousness' in bringing them under the control of aspects of their environment which were previously ineffective." (Skinner *op. cit.* p. 154)

Here we have the second of the two senses of the term 'consciousness' which appear in the title of this paper: 'consciousness' as something essentially linguistic and social, a body of linguistically formulated beliefs about environmental contingencies which are either shared or potentially shareable by a verbal community through the medium of interpersonal linguistic communication.

It thus appears that behaviourism in its most developed form ends up with a view on the issue of the mental life of animals which resembles both that of Aristotle and Descartes in effectively restricting mentality to humans on the grounds that they alone have the ability to talk. But whereas the case for denying mentality to animals rests for Aristotle on the mistaken view that the reason animals can't talk is that they can't abstract and for Descartes on the implausible contention that because animals can't report their private experiences they don't have any, Skinner is clearly on much firmer ground in claiming that, since animals don't talk, they can't think by talking to themselves, and can't communicate their thought to others.

The weakness of Skinner's position is that despite the dramatic differences which have come about as a consequence of the emergence of rule-governed behaviour between the mental life and behaviour of humans as compared with that of animals, it cannot be plausibly maintained that the linguistic and hence the interpersonally communicable consciousness that is peculiarly human is all that there is to mental life, that there is simply no such thing as thought and experience without language.

Davidson and Fodor

Before presenting my own view of this matter, I want to say a brief word about the contribution to the issue of animal mentality of two contemporary philosophers Donald Davidson (1982) and Jerry Fodor (1975). Davidson and Fodor share a common view of the nature of the mind which is remarkably similar to the view of consciousness as rule-governed behaviour which emerges from Skinner's later writings. For both of them the mind is construed as a system of propositional attitudes which controls the behaviour of the agent. These propositional attitudes are of two kinds, means-

[7] This concept of consciousness as the shared property of social group, like much else in Marx's thinking has its source in Hegel, specifically in the *Phänomenologie des Geistes* (Hegel 1807/1931).

end beliefs (Skinner's descriptive rules) and desires, where a desire may be construed as a motivational (pro/con) attitude towards the end or consequence specified in the means-end belief. According to both views such propositional attitudes are either already formulated (Fodor's view) or capable of formulation (Davidson's view) in language. Here again both are in agreement with Skinner. Where the two views fall apart and where Davidson lines up with Skinner against Fodor is in the interpretation that is given to the notion of language and linguistic formulation. For Davidson, as for Skinner, a propositional attitude can only exist in so far as the proposition in question is formulated or, at least potentially formulable as a sentence in natural language. It follows that for Davidson, as for Skinner, only linguistically competent human beings have propositional attitudes, only they have minds. For Fodor, on the other hand, all behaviour, animal as well as human, is controlled by propositional attitudes, but the propositions in question are formulated, not in the natural language of human interpersonal communication, but in the brain's `machine language', Fodor's (1975) "private language of thought".

I don't accept Fodor's theory, principally for two reasons

(1) as an eliminative connectionist, I see no reason to go along with the notion that the brain operates as a serial digital computer which is the model which underlies Fodor's thinking here,

(2) I reject Fodor's contention that the only way to explain the behaviour of complex living organisms is by reference to their propositional attitudes, their means-end beliefs and their desires.

As I see the matter, to explain the behaviour of an agent in terms of that agent's means-end beliefs presupposes that the behaviour is rule-governed in Skinner's sense of that term. But rule-governed behaviour is only one kind of behaviour, a form of behaviour which depends for its initiation in the first place on formulating the relevant contingencies as a sentence in natural language. It is a form of behaviour which is restricted to linguistically competent human adults and older children and even then to only a part of that behaviour. The behaviour of animals, pre-linguistic human infants and, in older children and adults, all the habitual, skilled and intuitive behaviour, verbal as well as non-verbal, is contingency-shaped. As such, it is susceptible to explanation by means of the principles of contingency-shaped behaviour as worked out in the animal behaviour laboratory.

Private/biological consciousness

While I agree with Davidson and Skinner in restricting the ascription of propositional attitudes in the sense of means-end beliefs (desires are a different matter) to linguistically competent humans, I cannot accept the view that consciousness and the mental are only present where there are linguistically communicable propositional attitudes. It is my belief that there is another form of consciousness which is tied to language only to the extent that human linguistic competence provides access to it in a way in which it cannot be accessed in the case of linguistic incompetents. This form

of consciousness does not depend for its *existence* on the possession of linguistic competence by its owner. It is as much part of the mental life of all warm-blooded vertebrates and perhaps of vertebrates in general, as it is of those few whose linguistic competence allows them to describe the stream of events in which it consists in their own case.[8] This is the consciousness that springs into life as we wake up from sleep, which changes from moment to moment as our attention moves from one feature of our sensory experience to another and from one thought or image to another, which is punctuated from time to time by emotional reactions to the different thoughts and experiences as they succeed one another, and which persists intermittently in the form of dream images and vague thoughts, decoupled from sensory input, while we are asleep. [This is the consciousness which is absent from part of the visual field in the condition known as "blindsight" (Weiskrantz 1986).] This is what I am calling in the title of this paper "consciousness in the private/biological sense".

By calling it 'private', I am drawing attention to the well known fact that most of this process, not all, takes place somewhere underneath the skin of its owner, to the fact that, if its owner is linguistically competent, she or he can give a first-hand running commentary on it as it unfolds during the day and a description after the event on waking from sleep which no one else can do. By calling it `biological', I imply that, in contrast to consciousness in the linguistic/social sense, this form of consciousness is not an exclusively human phenomenon, is part of the genetic endowment of most, if not all, other vertebrates, has been selected by virtue of the contribution it makes to the survival of the individual and thereby to the successful reproduction of the species, and finally, as I argued in my paper 'Is consciousness a brain process?' (Place 1956), is almost certainly on present evidence a process taking place inside the brain of its owner.

Problem Solving:
The Biological Function of Both Forms of Consciousness

My purpose in distinguishing these two senses in which the word 'consciousness' is used - and I should emphasize that they are far from being the only senses in which the term has been used during its long and convoluted history - is primarily to distinguish the sense in which consciousness for me is a process in the brain from another important sense of the term of whose referent I would not want to say this. I should emphasize, however, that the reason why consciousness in the linguistic/social sense is not a process in the brain is not because language somehow mysteriously

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[8] Although his account of it leaves much to be desired, Skinner (1974) also recognizes the existence of this pre-linguistic form of consciousness. This is made clear in the following passage:

> Other species are also conscious in the sense of being under stimulus control. They feel pain in the sense of responding to painful stimuli, ... but no verbal contingencies make them conscious of pain in the sense of feeling that they are feeling ... (Skinner, 1974, *op. cit.*, p. 220)

The source of this concept of consciousness is unclear. It is closely related to Descartes' *cogitatio* which is so translated by Anscombe and Geach (Descartes 1954); but there is no clear evidence of the term being used in exactly this sense, at least in English, before William James' *Principles of Psychology* of 1890.

allows us to escape from the constraints of the physical and the biological. Consciousness in this sense is not a process in the brain simply because it is not a process. It is a system of behaviour-controlling linguistic dispositions shared by a linguistic community. In so far as it makes sense to construe it as a process, it consists in the public sociolinguistic interactions between individual members of a verbal community, rather than anything going on inside the heads of individual community members. That is not to deny the obvious fact these sociolinguistic interactions are generated by private events inside the heads of individual participants. Nor is it to deny that any changes which result from those interactions will be reflected in the subsequent thoughts and experiences which make up the private consciousnesses of those individuals.

In order to compare like with like in this regard, we need to compare

(a) the process whereby a linguistically competent human being constructs verbally formulated means-end hypotheses in order to decide what to do in a problem situation constituted by the fact that no ready-made contingency-shaped behavioural strategy immediately suggests itself as the appropriate adaptation to it, with

(b) the process of problem solving in the case of an animal or pre-linguistic human infant who lacks the linguistic ability to construct hypotheses in language.

When we make this comparison, it becomes apparent that the two forms of consciousness are much closer than at first appears. For one thing, it is evident that human linguistic thinking forms an integral part of the thought processes which comprise consciousness in the private/biological sense. Indeed, it is only by subtracting this linguistic element from our profoundly linguistically infected private consciousness that we can get any kind of sense of what biological consciousness is like in the case of a linguistically incompetent infant or dumb animal. When we do this, we are left, so it seems to me, with a 'cognitive system' consisting of three functions, those of (1) selective attention, (2) image-formation, and (3) categorization. This system appears to have the same basic function as does the linguistically formulated thought process which is superimposed upon it with the acquisition of linguistic competence, that of enabling the organism to handle problem situations for which it has no ready-made, unconscious, automatic, intuitive and contingency-shaped behavioural strategy available. Thus, categorizing, conceptualizing, construing, interpreting - call it what you will - can be seen as an event whereby a set of behavioural strategies appropriate to the presence of a situation of a particular kind is pre-selected by the current input into the system. The activity of selective attention modifies the position and orientation of the sense organs and the figure-ground relations within the resulting input into the higher centres of the brain until an appropriate categorization/interpretation is achieved. In image-formation the process of figure-ground formation within the central input proceeds in a manner which is under-determined by the structure of the current input at the periphery, thereby enabling the organism to represent to itself environmental situations which are not currently present in much the same way that absent situations are represented in a linguistically formulated thought.

Conclusion

In many ways this pre-linguistic consciousness which we share with animals and human infants is just as effective as, if not more effective than, linguistically formulated thought processes as way of resolving those problems which it is capable of addressing. Language, however, gives a decisive edge to human problem-solving in two respects. Linguistic communication enables the individual to call upon the learning experiences of others and those of past generations as they are embodied in human culture. Linguistic competence also allows the individual to construct sentences specifying the relation between behaviour and its remoter consequences which could not otherwise affect what the agent chooses to do. Without tense to mark the difference between past, present and future and without some basic temporal concepts such as 'day', 'season' and 'year' which are inconceivable without language, pre-linguistic behaviour is sensitive only to its immediate consequences in the standard case, and only to those immediate consequences which the organism's sensorium allow it to discriminate. Remoter consequences can register only in so far as they are connected to the immediate consequences either by a stimulus-stimulus chain, as in the case of the 'bait-shy' phenomenon, or by a stimulus-response chain, as in the case of an animal learning to find its way through a maze to the ultimate goal of food-reinforcement.

But for that advantage a price has to be paid. Without the ability to foresee the remoter consequences of what we do, the technology on which the human species has depended for its survival since ancient times could not have developed. With it, we are confronted, as no pre-linguistic organism can be, by the prospect of what for all of us is the final unavoidable contingency, our own ultimate death and that of all those we love.

References

Aristotle (1941) *De Anima*. In R. McKeon (Ed.) *The Basic Works of Aristotle*. New York: Random House.

Binswanger, L. (1947) *Ausgewälte Vorträge und Aufsätze*. Bern: Francke.

Catania, A. C. and Harnad S. (Eds.) (1988) *The Selection of Behavior. The Operant Behaviorism of B.F.Skinner: Comments and Consequences*. Cambridge: Cambridge University Press.

[Churchland, P. M. (1988) *Matter and Consciousness*, Revised Edition, Cambridge, Massachusetts: MIT Press.]

Darwin, C. (1872) *Expression of the Emotions in Man and Animals*. London: Murray.

Davidson, D. (1982) Rational Animals. *Dialectica*, 36, 317-327.

Dennett, D. C. (1978) *Brainstorms: Philosophical Essays on the Mind and Psychology*. Montgomery, Vermont: Bradford.

Descartes, R. (1642/1954) *Meditations on First Philosophy*, 2nd Edition. In G. E. M. Anscombe and P. T. Geach (Trs. & Eds.) *Descartes: Philosophical Writings* London: Nelson.

Dugdale, N. and Lowe, C.F. (1990) Naming and stimulus equivalence. In D. E. Blackman and H. Lejeune (eds.) *Behaviour Analysis in Theory and Practice: Contributions and Controversies*. London: Erlbaum.

Ferster, C. B. and Skinner, B. F. (1957) *Schedules of Reinforcement*. New York: Appleton-Century-Crofts.

Fodor, J. (1975) *The Language of Thought*, New York: Crowell.

Hegel, G. W. F. (1807/1931) *Phänomenologie des Geistes*. English translation as *The Phenomenology of Mind* by J. B. Baillie, New York: Macmillan.

Herrnstein, R. J., Loveland, D. H. and Cable, C. (1976) Natural concepts in pigeons. *Journal of Experimental Psychology: Animal Behavior Processes*, **2**, 285-302.

James, W. (1890) *Principles of Psychology*, 2 Volumes. New York: Holt.

Lashley, K. S. (1938) The mechanism of vision. XV. Preliminary studies of the rat's capacity for detail vision. *Journal of General Psychology*, **18**, 123-193.

Lindsley, O. R. (1964) Direct measurement and the problems of retarded behaviour. *Journal of Education*, 47: 62-81.

Locke, J. (1706/1961) *An Essay Concerning Human Understanding*. London: Bassett. J. W. Yolton (Ed.) Two volumes, London: Everyman.

Lowe, C. F. (1992) *From Conditioning to Consciousness: The Cultural Origins of Mind*. An Inaugural Lecture by C. Fergus Lowe, Psychology, 29th November, 1989. Bangor, Gwynedd: Coleg Prifysgol Gogledd Cymru/University College of North Wales.

Luria, A. (1961) *The Role of Speech in the Regulation of Normal and Abnormal Behaviors*. New York: Liveright.

Morgan, C. Lloyd (1894) *Introduction to Comparative Psychology*. London: Scott.

Pavlov, I. P. (1927) *Conditioned Reflexes: An Investigation of the Physiological Activity of the Cerebral Cortex*. English translation by G. V. Anrep. London: Oxford University Press.

Pavlov, I. P. (1938) *Twenty Years of Objective Study of the Higher Nervous Activity (Behaviour) of Animals*, 6th edition. Moscow: State Biological and Medical Publishing House.

Pearce, J. M. (1988) Stimulus generalization and the acquisition of categories by pigeons. In L. Weiskrantz (Ed.) *Thought without Language*. Oxford: Clarendon Press, pp. 132-155.

Pearce, J. M. (1989) The acquisition of an artificial category by pigeons. *The Quarterly Journal of Experimental Psychology*, **41B**, 381-406.

Place, U. T. (1956) Is consciousness a brain process? *British Journal of Psychology*, **47**, 44-50.

Plato (1953) *Phaedo*. In W. D. Woodhead (Tr. & Ed.) *Plato: Socratic Dialogues*. London: Nelson.

Price, H. H. (1953) *Thinking and Experience*. London: Hutchinson.

Pringle-Patterson, A. S., Ed. (1924) *Locke's Essay Concerning Human Understanding*. Oxford: Clarendon Press.

Romanes, G. J. (1882) *Animal Intelligence*. London: Kegan, Paul, Trench.

Sidman, M. and Tailby, W. (1982) Conditional discrimination vs. matching to sample: an expansion of the testing paradigm. *Journal of the Experimental Analysis of Behavior*, 37: 5-22.

Skinner, B. F. (1963) Behaviorism at fifty. *Science*, **140**, 951-958.

Skinner, B. F. (1966) An operant analysis of problem solving. In B. Kleinmuntz (Ed.) *Problem Solving: Research, Method and Theory*. New York: Wiley.

Skinner, B. F. (1969) *Contingencies of Reinforcement*. New York: Appleton-Century-Crofts.

Skinner, B. F. (1974) *About Behaviorism*. New York: Knopf.

Skinner, B. F. (1975) The shaping of phylogenic behavior. *Journal of the Experimental Analysis of Behavior*, **7**, 117-120.

Thorndike, E. L. (1898) Animal Intelligence: an experimental study of the associative processes in animals. *Psychological Monographs*, No. 8.

Thorndike, E. L. (1911) *Animal Intelligence*. New York: Macmillan.

Vygotsky, L. (1962) *Thought and Language*. New York: Wiley.

Watson, J. B. (1913) Psychology as the behaviorist views it. *Psychological Review*, **20**, 158-177.

[Weiskrantz, L. (1986) *Blindsight: A Case Study and Implications*. Oxford: Clarendon Press.]