SCIENTIFIC MEETING

COMMUNICATION IN MAMMALS:
DECIPHERING MESSAGES IN VISUAL, ACOUSTIC AND OLFACTORY SIGNALS

Tuesday, 9 December 2008
The Meeting Rooms, The Zoological Society of London, Regent's Park, London NW1 4RY

Chair: Professor Robin Dunbar, University of Oxford

Functionally referential alarm calls in mammals: What do they refer to?
Professor Dr Marta Manser, University of Zurich, Switzerland

Functionally referential calls refer to specific stimuli in the external environment of the caller that promote adaptive responses in receivers. Common examples are the predator-specific alarm calls of certain species, which may refer to either specific predator types or species, or the location and behaviour of approaching predators. I review studies that concern the specific aspects eliciting different call types and present data on the 'animal moving' call in meerkats, which appears to refer specifically to the movement of a variety of animal species in the environment of the caller. This call type is elicited by animals moving both on the ground and in the air, regardless of whether they are dangerous (predators) or non-dangerous (herbivores, birds) to the meerkats. I suggest that this call type can be considered to be functionally referential. Furthermore, I address the question of whether functionally referential calls are **denotative**, referring to specific properties of predators, or **imperative**, instructing group members on appropriate responses. This question is of interest, because the two options suggest different underlying cognitive mechanisms in the production and perception of animal vocalisations.

Olfactory communication in humans and other mammals
Dr S. Craig Roberts, School of Biological Sciences, University of Liverpool, UK

Olfaction is perhaps the neglected sense in studies of communication. There are two main reasons for this: we rely on other sensory modalities, particularly vision, and there are also substantial technical challenges associated with capturing and analysing complex chemical signals, and with evaluating their effects on other individuals. At least in non-human mammals, however, these complex signals are known to simultaneously provide numerous kinds of information: about individual identity, gender, age, disease and relatedness, as well as about social, nutritional and

reproductive state. Over recent years there has been growing evidence that similar cues are contained within the body odours of humans too and that these cues are perceptible by other humans and, thus, they are available for communication, at least in some contexts. Specific examples include the discrimination of female reproductive state, maternal recognition by infants, perception of social status and perception of genetic dissimilarity in mate choice. In all cases, analogous evidence exists in other mammalian species. In this talk, I will present a brief overview of the evidence for such cues and what they can tell us about understanding behaviour, as well as describing some practical applications.

Seeing red: the role of colour in agonistic interactions in humans
Dr Russell Hill, Evolutionary Anthropology Research Group, Durham University, UK

Previous studies have suggested that colour is an important component of social communication in a variety of animals. Recent evidence suggests that it is equally important in humans. Specifically, the colour red appears to have particular salience in the context of mating competition. Red ornaments are sexually selected, testosterone-dependent signals of mate quality in a variety of animals; for example, in zebra finches a male's dominance can be increased simply by the attachment of artificial red stimuli. We show that similar effects can be demonstrated in humans. Across a wide array of sporting and competitive contests, the data suggest that wearing red increases the probability of winning. Experiments to determine the mechanisms underlying this 'red advantage' suggest strong effects on the opponent or receiver of the signal; for example, people wearing red are perceived as significantly more aggressive and more dominant than those wearing other colours. It is proposed that the effects of red stimuli on behaviour and social perceptions reflect an unconscious bias to associate redness with dominance.

Vocal communication and social cognition: insights from playback experiments on lions, elephants and horses
Dr Karen McComb, Centre for Mammal Vocal Communication Research, Department of Psychology, University of Sussex, UK.

The technique of recording vocalisations from animals and playing them back through a loudspeaker can provide a powerful tool for exploring animal cognitive abilities. This is because the responses of subjects to playback can reveal not only what information is contained in the call but also what the listeners know about the caller(s). I will present the findings of playback experiments on African lions, African elephants and domestic horses that have provided insights into cognitive abilities that are directly relevant to the decisions that animals make on a daily basis in their natural environments. In particular, I will focus on cognitive abilities that underpin social knowledge and individual recognition.