

# CURRICULUM VITAE

Chris Knight

(Last updated September 2007)

School of Social Cultural & Media Studies, University of East London, Docklands Campus, University Way London E16 2RD

020-8223-2789 [chris.knight@uel.ac.uk](mailto:chris.knight@uel.ac.uk)

## QUALIFICATIONS

**Ph.D. in Anthropology**, University of London, 1987.

**Diploma in Social Anthropology**, University College London, 1978.

**M.Phil., Russian Studies**, University of Sussex, 1977.

**Graduate Certificate of Education**, French and Russian Language, Leeds University, 1972.

**B.A. (Hons.)**, Russian Studies, University of Sussex, 1966.

## CAREER HISTORY

Before studying anthropology, I worked as a postman/van driver for the Post Office and then as a supply teacher in a South London comprehensive school. Trained as a social anthropologist under Professor Mary Douglas and Professor Andrew Strathern at University College London, I received my Ph.D. in 1987 for a reanalysis of Claude Lévi-Strauss's 4-volume study of Native American myths, *Mythologiques*.

**Present Appointment: University of East London.** Professor of Anthropology.

## RESEARCH AND PUBLICATIONS

My research is focused on the evolutionary emergence of human language and symbolic culture. Unlike many others who have addressed such topics, I have resisted the temptation to choose between Darwinian perspectives and those of linguists and social anthropologists. Instead, I have subordinated my hypothesis building to the constraints of standard Darwinian theory while insisting that any model must be testable in the light of linguistic and symbolic cultural data. I am perhaps best known for having drawn attention to the centrality of reproductive strategies and sexual signalling in the evolution of symbolic culture. In particular, menstrual taboos are ubiquitous among extant hunter-gatherers and cry out for an explanation consistent with Darwinian theoretical premises. In agreement with Emile Durkheim and much early social evolutionist speculation, my proposal is that ritual prohibitions surrounding menstruation were an early feature of symbolic culture and that they served the fitness interests of evolving human mothers. I have advanced a speculative theory that alliance building and sexual signalling strategies pursued by human females interacted with male strategies in a process culminating in a social, sexual and political revolution – the so-called 'human revolution' in which our uniquely culture-bearing species was born.

My writing and research on these and other topics has been described as "exhilaratingly original and interdisciplinary" (Caroline Humphrey, *The London Review of Books*). My first full-length book, *Blood Relations*, received unanimously favourable reviews – most prominently in *The Journal of the Royal Anthropological Institute*, *The Times Higher Educational Supplement*, *The Times Literary Supplement* and *The London Review of Books*; it also received publicity through an interview on the BBC World Service *Science Now* programme, a debate with Dr. Henrietta Moore on BBC Radio *Woman's Hour*, a front-page news report in *The Independent on Sunday* and coverage in many other periodicals. Professor Alex Walter (Anthropology, Rutgers University): 'This book may be the most important ever written on the evolution of human social organization'. In April 1998, the *Independent on Sunday* featured a two-page article on my work and that of my colleague, Camilla Power, by science correspondent Marek Kohn, who describes our research team as 'drawing together some of the most dynamic lines of argument in current British evolutionary thought'. In 2000, I was awarded a Leverhulme Fellowship and in 2002 was appointed Professor of Anthropology at the University of East London.

Reflecting the growing status of my theory of human origins, the popular science writer Marek Kohn made it the centrepiece of his 1999 book, *As We Know It: Coming to Terms with an Evolved Mind* (London: Granta), while the magazine *New Scientist* in 2002 made it the focus of a four-page feature article. In 2005, following an encounter with Noam Chomsky in New York, I began collaborating with Professor Luc Steels of the Free University of Brussels. A designer of 'linguistically' self-organized robots, Steels is arguably the world's foremost expert in artificial intelligence research. In July 2006, we attended the *Language, Culture and Mind* conference in Paris to present a paper entitled *Language evolution among artificial embodied agents and populations of ancestral humans*; we are now applying for funding to develop our collaborative research. In April 2007, Oxford University Press accepted my proposal – co-authored with Rudolph Botha of Stellenbosch University – for two major edited volumes on language evolution (*The Prehistory of Language* and *The Cradle of Language*). In December 2007, I will be an invited speaker at an international conference on primate behaviour and human universals featuring many of the most prominent figures in evolutionary science.

## PUBLICATIONS:

- Knight, C. (1978). The origins of woman: A marxist-structuralist view of the genesis of culture. *Critique of Anthropology* 3: 59-87.
- Knight, C. (1983). Lévi-Strauss and the dragon: Mythologies reconsidered in the light of an Australian Aboriginal myth. *Man* (N.S.) 18: 21-50.
- Knight, C. (1985). Menstruation as medicine. *Social Science and Medicine* 21: 671-683.
- Knight, C. (1987). [Menstruation and the origins of culture. A reconsideration of Lévi-Strauss's work on symbolism and myth.](#) Unpublished Ph.D. thesis. University of London, London.
- Knight, C. (1988). Menstruation and the Australian Aboriginal Rainbow Snake. In T. Buckley and A. Gottlieb (eds), *Blood Relations. The Anthropology of Menstruation*. California: University of California Press.
- Knight, C. (1991). On the dragon-wings of time. In I. Cardigos (ed.) *Maidens, Snakes and Dragons*. Cecil Papers 1, Kings College Press.
- Knight, C. (1994). Why ritual? Introduction to C. Knight & C. Power (eds), *Ritual and the origins of symbolism. Papers presented to the Human Evolution Interdisciplinary Research Unit conference on ritual and the origins of culture*. London: University of East London Sociology Department, pp. 1-3.
- Knight, C. (1994). [Ritual and the origins of language.](#) In C. Knight & C. Power (eds), *Ritual and the origins of symbolism. Two papers presented to the Human Evolution Interdisciplinary Research Unit conference on ritual and the origins of culture*. London: University of East London Sociology Department, pp. 4-19.
- Knight, C. (1995). Tools, language and cognition. *Journal of the Royal Anthropological Institute* 1 (2).
- Knight, C. (1995). *Blood Relations: Menstruation and the Origins of Culture*. New Haven and London: Yale University Press. [\[Front cover image\]](#)
- Knight, C. (1996). Darwinism and collective representations. In S. Shennan and J. Steele (eds), *The Archaeology of Human Ancestry: Power, Sex and Tradition*. London: Routledge, pp. 331-346.
- Knight, C. (1996). 'Menstruation'. In A. Barnard and J. Spencer (eds), *Encyclopedia of Social and Cultural Anthropology*. London: Routledge.
- Knight, C. (1996). 'Taboo'. In A. Barnard and J. Spencer (eds), *Encyclopedia of Social and Cultural Anthropology*. London: Routledge.
- Knight, C. (1996). 'Totemism'. In A. Barnard and J. Spencer (eds), *Encyclopedia of Social and Cultural Anthropology*. London: Routledge.
- Knight, C. (1997). [The Wives of the Sun and the Moon.](#) *Journal of the Royal Anthropological Institute* 3 (1): 133-153.
- Knight, C. (1998) Introduction: Grounding language function in social cognition. In J. Hurford, M. Studdert-Kennedy and C. Knight (eds), *Approaches to the Evolution of Language: Social and Cognitive Bases*. Cambridge: Cambridge University Press, pp. 9-16.
- Knight, C. (1998) [Speech/ritual co-evolution: A selfish gene solution to the problem of deception.](#) In J. Hurford, M. Studdert-Kennedy and C. Knight (eds), *Approaches to the Evolution of Language: Social and Cognitive Bases*. Cambridge: Cambridge University Press, pp. 68-91.
- Knight, C. (1999). [Sex and language as pretend play.](#) In R. Dunbar, C. Knight and C. Power (eds), *The Evolution of Culture*.

Edinburgh : Edinburgh University Press, pp. 228-247.

- Knight, C. (2000). [Introduction: the evolution of cooperative communication](#). In C. Knight, J. Hurford and M. Studdert-Kennedy (eds), pp. 19-26.
- Knight, C. (2000). [Play as precursor of phonology and syntax](#). In Chris Knight, M. Studdert-Kennedy and J. R. Hurford, (eds), [The Evolutionary Emergence of Language: Social function and the origins of linguistic form](#). Cambridge: Cambridge University Press, pp. 99-119.
- Knight, C. (2000). [Culture, cognition and conflict](#). Review article. *Cambridge Archaeological Journal*, **10**(1): 189-97.
- Knight, C. (2001). Does cultural evolution need matriliney? Commentary on Rendell & Whitehead: Culture in whales and dolphins. *Behavioural and Brain Sciences*, Vol. **24** (2): 339-340.
- Knight, C. (2002). [Language and revolutionary consciousness](#). In A. Wray (ed.), *The Transition to Language*. Oxford : Oxford University Press.
- Knight, C. (2003). The secret of lateralization is trust. *Behavioral and Brain Sciences* **26** 231-232.
- Knight, C. (2003). [Trauma, tedium and tautology in the study of ritual](#). *Cambridge Archaeological Journal*, **13** (2): 293-5 (2003).
- Knight, C. (2004). [Decoding Chomsky](#). *European Review* **12** (4): 581-603.
- Knight, C. (2004). [We need behavioural ecology to explain the institutional authority of the gods](#). Commentary on Atran and Norenzayan: Religion's evolutionary landscape. *Behavioral and Brain Sciences* **27**(26): 30.
- Knight, C. (2006). [Language co-evolved with the rule of law](#). In A. Cangelosi, A. D. M. Smith and K. Smith (eds) *The evolution of language. Proceedings of the Sixth International Conference (EVOLANG6)*. New Jersey & London: World Scientific Publishing, pp. 168-75.
- Knight, C. (2007). Revisiting matrilineal priority. In J. Lassègue (ed), *Émergence et évolution de la parenté*. Paris: Éditions Rue d'Ulm/Presses de l'École normale supérieure, pp. 25-43.
- Knight, C. (forthcoming). Ochre, language and the rule of law: a speculative reconstruction of the Middle Stone Age 'human revolution. In: P. Kappeler (ed), *Primate Behavior and Human Universals*. Chicago: Chicago University Press.
- Knight, C. (in preparation) *The Human Conspiracy: Deception, Speech and the Selfish Gene*. Yale: Yale University Press.

#### **PUBLICATIONS: Jointly authored**

- Knight, C. and C. Maisels (1994). Fertility Rights. *Times Higher Educational Supplement* September 23.
- Knight, C. and C. Maisels (1994). An instinct for revolution. *Anthropology Today* **10** (6): 20-22.
- Knight, C., C. Power and I. Watts (1995). The human symbolic revolution: A Darwinian account. *Cambridge Archaeological Journal* **5** (1): 75-114.
- Knight, C. and C. Power (1995). Ochre and Sexual Deception. *British Archaeology* **2**.
- Knight, C. and C. Power (1998). The origins of anthropomorphic thinking. *Journal of the Royal Anthropological Institute* **4** (1): 129-131.
- Knight, C. and C. Power (2005). Grandmothers, politics, and getting back to science. In E. Voland, A. Chasiotis and W. Schiefelöhne (eds.), *Grandmotherhood: The evolutionary significance of the second half of female life*. New Brunswick: Rutgers, pp. 81-98.
- Hurford, J., M. Studdert-Kennedy and C. Knight (eds) (1998). *Approaches to the Evolution of Language: Social and Cognitive Bases*. Cambridge: Cambridge University Press.
- Studdert-Kennedy, M., C. Knight and J. Hurford (1998). Introduction: new approaches to language evolution. In J. Hurford, M. Studdert-Kennedy and C. Knight (eds), *Approaches to the Evolution of Language: Social and Cognitive Bases*. Cambridge: Cambridge University Press, pp. 1-5.
- Knight, C. C. Power and R. Dunbar (1999). An evolutionary approach to human culture. In R. Dunbar, C. Knight and C. Power (eds), *The Evolution of Culture*. Edinburgh: Edinburgh University Press, pp. 1-11.
- Knight, C., M. Studdert-Kennedy and J. R. Hurford (2000). Language: A Darwinian Adaptation? In C. Knight, J. Hurford and M. Studdert-Kennedy (eds), *Approaches to the Evolution of Language: Volume 2*. Cambridge: Cambridge University Press, pp. 1-15.
- Rafiki, Y., C. Knight and C. Power (eds) (2002). An Arusha Declaration for 2002. *Anthropology Today* Vol. 18, No 4.

## EDITED VOLUMES

- Dunbar, R., C. Knight and C. Power (eds) (1999). *The Evolution of Culture*. Edinburgh: Edinburgh University Press.
- Knight, C., J. Hurford and M. Studdert-Kennedy (eds) (2000). *Approaches to the Evolution of Language: Volume 2*. Cambridge: Cambridge University Press.
- Knight, C., J. Hurford and M. Studdert-Kennedy (eds), (2000). *The Evolutionary Emergence of Language: Social function and the origins of linguistic form*. Cambridge: Cambridge University Press.
- Botha, R. and C. Knight (eds) (in press). *The Prehistory of Language*. Oxford: Oxford University Press.
- Botha, R. and C. Knight (eds) (in press). *The Cradle of Language*. Oxford: Oxford University Press.

## REPORTS AND REVIEWS

- Book Review, P. Garlake 'The Hunter's Vision'. *British Archaeology* (1995).
- Book Review, T. Megarry 'Society in Prehistory'. *The Journal of the Royal Anthropological Institute* **2** (4): 738-739 (1996).
- Report on the 'Evolution of Language Conference'. *Anthropology Today* **12** (6) (1996).
- Review of V. Morrell 'Ancestral Passions'. *The Journal of the Royal Anthropological Institute* **3** (2): 387-388 (1997).
- Review of T. Taylor 'The Prehistory of Sex'. *The Journal of the Royal Anthropological Institute* **4** (1): 137-137 (1998).
- Commentary on N. Humphrey 'Cave Art, Autism, and the Evolution of the Human Mind'. *Cambridge Archaeological Journal* **8** (2): 183 (1998).
- Commentary on N. Humphrey, 'Cave Art, Autism, and the Evolution of the Human Mind'. *Journal of Consciousness Studies* **6**: 132-133 (1999).
- Review of T. Deacon, 'The Symbolic Species'. *Journal of the Royal Anthropological Institute* **5** (1): 105-106 (1999).
- Review of D. Bickerton, 'Language and human behaviour'. *Journal of the Royal Anthropological Institute* **5** (4): 655-656 (1999).
- Review of A. Carstairs-McCarthy, 'The origins of complex language'. *Journal of the Royal Anthropological Institute* **6** (2): 339 (2000).
- Review of L. Cronk, 'That complex whole'. *Journal of the Royal Anthropological Institute* **6** (4): 727-8 (2000).
- Review of Roy A. Rappaport, 'Ritual and religion in the making of humanity'. *The Journal of the Royal Anthropological Institute* **7** (2): 380-591-592 (2001).
- Review of P. Carruthers and A. Chamberlain (eds), 'Evolution and the human mind'. *Journal of the Royal Anthropological Institute* **7** (4): 805-06 (2001).
- Review of M. P. Ghiglieri, 'The dark side of man: tracing the origins of male violence'. *The Journal of the Royal Anthropological Institute* **8** (3): 591-592 (2002).
- Review of W. G. Runciman (ed.), '[The origin of human social institutions](#)'. *The Journal of the Royal Anthropological Institute* **8** (4): 807-808 (2002).
- Review of Fox, R. G. and B. J. King (eds), 'Anthropology Beyond Culture'. *The Journal of the Royal Anthropological Institute* **9**(4) (2002).
- Review of L. Barrett, R. Dunbar and J. Lycett, 'Human evolutionary psychology'. *The Journal of the Royal Anthropological Institute* **9** (1): (2003).
- Review of J. Marks, 'What it means to be 98% chimpanzee: apes, people, and their genes'. *The Journal of the Royal Anthropological Institute* **9**(2): 386-87 (2003).
- Review of W. Stoczkowski, 'Explaining human origins: myth, imagination and conjecture'. *The Journal of the Royal Anthropological Institute* **9**(4): 813-814 (2003).
- Review of R. N. McCauley & E. T. Lawson, '[Bringing ritual to mind: Psychological foundations of cultural form](#)'. *Cambridge Archaeological Journal*, **13** (2): 293-5 (2003).
- Review of P. Valentine, 'Cultures of Multiple Fathers'. *The Journal of the Royal Anthropological Institute* **10**(1): 206-07 (2004).
- Review of S. Atran, 'In gods we trust: the evolutionary landscape of religion'. *Journal of the Royal Anthropological Institute* **10**(1): 199-

200 (2004).

Review of K. Coe, 'The ancestress hypothesis'. *The Quarterly Review of Biology* **79**(1): 115 (2004).

Review of R. Mace, C. Holden and S. Shennan (eds), '[The evolution of cultural diversity: phylogenetic approaches](#)'. *Journal of the Royal Anthropological Society*, **13** (2): 227-228 (2007).

### **CORRESPONDENCE AND DEBATE**

R. Layton, C. Knight (1984). Snakes and Dragons. *Man* (N.S.) **19**(1): 150-157.

C. Knight, C. Power, S. Mithen (1998). [The Origins of Anthropomorphic Thinking](#). *The Journal of the Royal Anthropological Institute* **4**(1): 129-132.

### **UNPUBLISHED PEER REVIEWS**

Yale University Press (April 1993), *Ethology and Sociobiology* (April 1995, March 1996), *Journal of the Royal Anthropological Institute* (August 1995, January 2007, April 2007), *Anthropology Today* (September 1998), *Current Anthropology* (December 1998), Cambridge University Press (June 1998), MIT Press (August 1998) and *Psychology* (January 1999).

### **CONFERENCE PAPERS AND PRESENTATIONS (since 1992)**

*Call-systems, deception and protolanguage: Towards a theory of the emergence of symbolic behavior*. Paper delivered to the Human Evolution Interdisciplinary Research Group, University of Sheffield (March 1992).

*Menstruation and the origins of culture*. Invited lecture to the Department of Anthropology, University of Kent (November 1992).

*Darwinism and collective representations*. Paper delivered to the Annual Conference of the Theoretical Archaeology Group, Southampton (December 1992).

*The origins of symbolic culture*. Panel display, Paleolithic and Mesolithic Day Meeting, British Museum, London (February 1993).

*Darwinism and the origins of language*. Panel presentation, Evolution and Human Sciences Conference, London School of Economics (June 1993).

*A testable theory of symbolic cultural origins*. Invited lecture, Symposium on Gesture, Speech, Time and Contract, University of Michigan, Michigan USA (July 1993).

*The origins of language*. Paper delivered to the Theoretical Archaeology Group Annual Conference, Southampton University (December 1993).

*The emergence of symbolic behaviour*. Paper delivered to the Ritual and the Origins of Culture Conference, School of African and Oriental Studies, London (March 1994).

*An instinct for revolution? Selfish genes and the origins of language*. Paper delivered to the Theoretical Archaeology Group Annual Conference, Bradford University (December 1994).

*The Evolution of Language*. CIBA Foundation/Royal Society Discussion Meeting, London (March 1995).

*Darwinism and the emergence of language*. Paper delivered to the Annual Conference of the Human Behavior and Evolution Society, Santa Barbara, USA (July 1995).

*Can Darwinism explain the origins of culture? UCL Anthropology Society Debate: Ingold v Knight*, University College London (March 1996).

*Blood magic: Menstruation and the origins of culture*. Invited lecture to the Department of Social Anthropology, Queen's University, Belfast, Northern Ireland (March 1996).

*Can Darwinism explain the origins of culture? Invited lecture to the South Place Ethical Society*, London (May 1996).

*Ritual/speech co-evolution: A selfish gene solution to the problem of deception*. Paper delivered to the Evolution of Language Conference, University of Edinburgh, Scotland (April 1996).

*Speech/ritual co-evolution: A 'selfish gene' explanation of the emergence of symbolic culture*. Paper delivered to the Human Behaviour and Evolution Society Conference, Northwestern University, Illinois, USA (June 1996).

*Speech/ritual co-evolution: A 'selfish gene' explanation of the emergence of symbolic culture*. Paper delivered to the World Archaeological Congress, Forlì, Italy (September 1996).

*The sociobiology of deception*. Paper delivered to the Oxford Human Sciences Symposium 1996, Oxford University (November

1996).

*The origins of language: Current theories. Paper delivered to the Department of Human Sciences, Oxford University (December 1996).*

*Ritual/speech co-evolution: A Darwinian model. Paper delivered to the Theoretical Archaeology Group Annual Conference, Liverpool University (December 1996).*

*Evolution of language. Paper delivered to the Consciousness Studies Society, University of London (March 1997).*

*The current revolution in the life sciences: Prelude to social revolution. Paper delivered to the 'Has science gone far enough' Conference, University of East London (March 1997).*

*Evolution of language. Paper delivered to the European Sociobiological Society Conference on Ingroup/Out-group Behaviour, Ghent, Belgium (July 1997)*

*The dragon and the origins of art. Paper delivered to the 21st International Conference on the Unity of the Sciences, Washington DC, USA (November 1997)*

*Ritual and the evolution of syntactical speech. Paper delivered to the 2nd International Conference on the Evolution of Language, London (April 1998)*

*Darwinism and the origins of language. Paper delivered to the International Youth Conference, Bergama , Turkey (August 1998)*

*The evolution of brideservice. Paper delivered to the Marriage, Morality and Emotions – Updating Edward Westermarck International Symposium, Helsinki , Finland (November 1998)*

*Laughter and the evolution of language. Paper delivered to The Institute for Cultural Research, London (April 1999)*

*Ritual and the evolution of culture. Keynote address, International Conference on Ritual and the Evolution of Culture, Bratislava, Slovakia (September 1999).*

*From 'Nursing Poke' to syntactical speech. Paper delivered to the Third International Conference on the Evolution of Language, Paris, France (April 2000).*

*Language and Laughter. Paper delivered to the Annual Conference of the Folklore Society, London (April 2001).*

*Speech: An exception to the handicap principle? Paper delivered to the 'Costly signaling and the evolution of culture' symposium, Human Behaviour and Evolution Society annual conference, London (June 2001).*

*African Genesis: The Evolutionary Emergence of Language. Invited lecture, Dartmouth College, Department of African and African-American Studies , Hanover, USA (October 2001).*

*The Evolutionary Emergence of Language. Research Seminars on Anthropological Theory, London School of Economics (invited guest lecturer (February 2002).*

*Play, Laughter and the Origins of Language. Invited public lecture, École Normale Supérieure, Paris, France (June 2002).*

*Seven Paradoxes in the Evolution of Language. Paper delivered to the Fourth International Conference on the Evolution of Language, Harvard University, Boston (April 2002).*

*Menstruation and lunar timekeeping in African hunter-gatherer traditions. Paper delivered to the Association of Social Anthropologists Conference, 'Perspectives on Time and Society: Experience, Memory, History,' Arusha, Tanzania (April 2002).*

*The Evolutionary Emergence of Language. Invited lecture, Department of Psychology, University of St. Andrews, Scotland (October 2002).*

*Matrilineal priority reconsidered. Invited keynote lecture, Atelier 'Emergence de la parenté', Ecole Normale Supérieure, Paris (November 2003).*

*The Role of Ritual in the Evolution of Social Cognition. Introductory talk by Chris Knight and Martin Kanovsky to the workshop on 'Identity and Alterity from a Cognitive and Evolutionary Perspective'. Eight Biennial Conference of the European Association of Social Anthropologists. University of Vienna (September 2004).*

*The origins of language. Paper presented to the workshop on 'Identity and Alterity from a Cognitive and Evolutionary Perspective', Eight Biennial Conference of the European Association of Social Anthropologists. University of Vienna (September 2004).*

*The Human Revolution. Invited speaker and panel discussant, Morris Symposium on the Evolution of Language, Stony Brook University, New York, U.S.A (October 2005)*

*'How the Moon got its spots': a new look at Claude Lévi-Strauss. Session on the Archaeology and Anthropology of Moonshine. Theoretical Archaeology Group conference, Sheffield University, Sheffield (December 2005).*

*Language evolution among artificial embodied agents and populations of ancestral humans. Joint presentation by Chris Knight and Luc Steels: 'Language, Culture and Mind' conference, Ecole Nationale Supérieure des Télécommunications (ENST) Paris (July 2006).*

*Human Social Evolution. Invited lecture, Summer School on Evolutionary Anthropology, Hanse-Wissenschaftskolleg Delmenhorst (August 2006)*

*Language, ochre and the rule of law. Keynote address to the 'Cradle of Language' conference, Stellenbosch, South Africa (November 2006).*

*Ochre and the rule of law. Presentation to interdisciplinary symposium, 'How Did the Brain Become Social?' Autonomous University of Barcelona (February 2007).*

*Panel discussion: How Did the Brain Become Social? Centre for Contemporary Culture (CCCB), Barcelona (February 2007).*

*Ochre, language and the rule of law: a speculative reconstruction of the Middle Stone Age 'human revolution'. Invited lecture, Göttinger Freilandtage Bi-annual International Conference on Primate Behaviour and Human Universals. University of Göttingen, Göttingen (December 2007).*

## **JOURNALISM**

Knight, C. (1992). The Human Revolution. *Socialist Organiser*, August 13.

Knight, C. (1992). Who's afraid of science? *Labour Briefing*, September issue.

Knight, C. (1996). Fighting the new Irrationalism. *Labour Left Briefing*, February issue.

Knight, C. (1996). A female conspiracy? *Labour Left Briefing*, May issue.

Knight, C. (1996). Life without faith? *Labour Left Briefing*, July issue.

Knight, C. (1996). Ourselves alone. *Labour Left Briefing*, November issue.

Knight, C. (1996). The world's first picket line. *Labour Left Briefing*, December issue.

Knight, C. (1997). The Human Revolution. *The Workers International Press*, March issue.

Knight, C. (1997). The origins of human society. *Towards 2012 Part III: Culture and Language*, June issue.

Knight, C. (2003). [Noam Chomsky: Politics or Science?](#) *What Next? Marxist Discussion Journal*. **26**: 17-29.

Knight, C. (2006). [The science of solidarity](#). *Weekly Worker* **636** August 3.

Knight, C. (2006). [Solidarity and sex](#). *Weekly Worker* **638** August 31.

Knight, C. (2006). [The science of Marxism](#). *Weekly Worker* **642** September 28.

Knight, C. (2006). [Marxism and scientific revolutions](#). *Weekly Worker* **643** October 5.

Knight, C. (2006). [Lessons of October](#). *Weekly Worker* **646** October 26.

Knight, C. (2007). [The Chomsky enigma](#). *Weekly Worker* **655** January 11.

Knight, C. (2007). [U.S. establishment anarchist](#). *Weekly Worker* **656** January 18.

Knight, C. (2007). [Chomsky's parallel lives](#). *Weekly Worker* **657** January 25.

## **ACTIVISM**

*In defence of science. Invited lecture to the Haringey Miners' Support Group, London (April 1993).*

*Science as revolutionary knowledge. Debate organized by the Department of Sociology. Jordan v Knight, University of East London (November 1993).*

*The world's first picket line: Women and the emergence of morality. Paper delivered to the Merseyside Port Shop Stewards Committee, Transport House, Liverpool (November 1996).*

*Human Origins and the 'Primitivism' Debate. Paper delivered in the 'Mind Benders' session, 'Reclaim the Future', London (September 2000).*

*Reclaim the Streets and the Liverpool Docks. Invited talk and video interview, Precursors to Seattle. Annual Conference of the London Socialist Historians' Society, University of London (May 2002).*

*Noam Chomsky and the Human Revolution. International Symposium on the Human Revolution. Communist University of London,*

Goldsmiths College, London (August 2006).

'How to run a brothel': *An anthropological perspective on sex work*. Invited talk to the International Union of Sex Workers, London (October 2006).

## **MEDIA ACTIVITIES**

Academic consultant to BBC2 Science Features (1994/5).

Radio interview for GLR, *Magic, Myth and Folklore* (January 1996).

Television interview for Carlton Television's 'Shift' programme (February 1996).

Academic consultant to BBC, *The Seven Ages of Life* (March 1996).

Academic consultant to Lara Owen (independent film producer), *Her Blood is Gold* (April 1996).

Scientific consultant for BBC TV's 'Stonehenge' programme (January 1998)

Radio interview for Norwegian State Radio on Language Evolution (April 1998)

Radio interview for Danish programme on Language Evolution (April 1998)

Scientific consultant to Diana Fabianova, TV documentary film [The Moon Inside You](#) (2005).

Television interview, *The Origins of Language*, REDES science programme (RTVE National TV channel), Barcelona (February 2007).

## **OTHER CONTRIBUTIONS**

Principal Lecturer at the weekly *Radical Anthropology Group* evening class, London.

Session Organizer: The Origins of Language, Gender and Culture: Darwinian Approaches to the 'Human Revolution', Theoretical Archaeological Group Annual Conference, Bradford University (1994).

Co-Organizer with J. Aitchison (Oxford University) and J. Hurford (Edinburgh University) of the First International Conference on the Evolution of Language, Edinburgh University, Edinburgh (1996).

Symposium Organizer: Language and the Arts: Implications of Evolutionary Theory, Human Behaviour and Evolution Society Conference, Tuscan, Arizona, USA (1997).

Local Organizer with J. Aitchison (Oxford University) and J. Hurford (Edinburgh University) of the Second International Evolution of Language Conference, University of East London (1998).

Co-Organizer with J. Aitchison (Oxford University), J.-L. Dessalles, (CRNS, Paris) and J. Hurford (Edinburgh University) of the International Evolution of Language Conference, Paris (2000).

Co-Organizer with Tecumseh Fitch (Harvard University), J. Hurford (Edinburgh University) and J.-L. Dessalles (CRNS, Paris) of the Fourth International Conference on the Evolution of Language, Harvard (2002).

Co-organizer with Jean-Louis Dessalles (E.N.S.T.), 'Modélisation de l'émergence du langage' workshop, Paris (June 2002).

Session organizer, 'Costly signaling and the evolution of culture'. *Human Behaviour and Evolution Society* annual conference, London (June 2001).

Co-organizer with Martin Kanovksy (Comenius University, Bratislava) of the Cognitive and Evolutionary Perspectives workshop, Eighth Biennial Conference of the European Association of Social Anthropologists, University of Vienna (September 2004).

Co-organizer with Bernard Comrie (Max Planck Institute, Leipzig), Jean-Louis Dessalles (Ecole Nationale Supérieure des Télécommunications, Paris), Tecumseh Fitch (Wissenschaftskolleg, Berlin; University of St Andrews), James R Hurford (University of Edinburgh), Michael Studdert-Kennedy (Haskins Laboratories), Maggie Tallerman (University of Durham) and Alison Wray (Cardiff University) of the Fifth International Conference on the Evolution of Language, Leipzig (April 2004)

Co-organizer with Angelo Cangelosi (University of Plymouth), Bernard Comrie (Max Planck Institute, Leipzig), Jean-Louis Dessalles (Ecole Nationale Supérieure des Télécommunications, Paris), Tecumseh Fitch (University of St Andrews), James R Hurford (Edinburgh University), Maggie Tallerman (University of Newcastle upon Tyne), Domenico Parisi (ISTC-CNR, National Research Council Rome) and Alison Wray (Cardiff University) of the Sixth International Conference on the Evolution of Language, Rome (April 2006).

Scientific Advisor, *Language, Culture and Mind Conference*, École Nationale Supérieure des Télécommunications (ENST) Paris (2006).

Convenor, International Symposium on the Human Revolution. *Communist University of London*, Goldsmiths College, London, August 2006.

Scientific Advisor, *The Cradle of Language Conference*, Stellenbosch University, South Africa (2006).

## MEMBERSHIP OF PROFESSIONAL AND RESEARCH ORGANISATIONS

**Association of Social Anthropologists of the Commonwealth** since 1990.

**European Association of Social Anthropologists** since 1990.

**Human Behavior and Evolution Society** since 1990.

**Radical Anthropology Group** since 1985.

**Human Evolution Interdisciplinary Research Unit** 1990 - 1994.

**The Primate Society** since 1991.

**British Association for Social Anthropology in Policy and Practice** since 1991.

**Royal Anthropological Institute** since 1977.

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## APPENDIX A

Responses to **Chris Knight (1991)**, *Blood Relations: Menstruation and the Origins of Culture*. London & New Haven: Yale University Press.

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*"A most important, novel, well-argued and monumental piece of work"*

**J. D. Lewis-Williams**, Rock Art Research Unit, University of the Witwatersrand

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*"This book may be the most important ever written on the evolution of human social organization. It brings together observation and theory from social anthropology, primatology, and paleoanthropology in a manner never before equalled. The author, Chris Knight, who teaches social anthropology at the University of East London, is up to date on all these fields and has achieved an extraordinary synthesis. His critiques of Claude Lévi-Strauss on totemism and myth are a sheer tour de force."*

**Alex Walter**, Department of Anthropology, Rutgers University

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*"Blood Relations is an extraordinary work, in which imaginary creatures and magical events are orchestrated on a global scale, from Australia to Amazonia, into a single vision of how humans created humanity.... Though Knight does tend to resemble a shaman with a spread-sheet, he is not concocting some syncretic religious brew of Darwinism and tribal initiation rites. He is every bit as materialist as Dennett or Dawkins – ultra-Darwinian, in Stephen Jay Gould's terms – but unlike them, he has an intuitive understanding of the sacred. The trick here is to retain one's sense of magic after one stops believing in it. Blood Relations appreciated the importance of sacred ritual, and of sociobiology, the better for being able to stand outside them. Writing under the influence of Primate Visions, Donna Haraway's feminist interpretation of primatology, Knight felt able to refer to his own narrative as myth, and free to bring his own props to the sociobiology show. 'If you could have calculating, maximising capitalists operating in human origins narratives, why could you not also have militant trade unionists?' he asked. 'If you could have profits and dividends, why not also industrial action, pay bargaining and strikes?' Culture, he proposed, was the settlement that followed the world's first strike."*

**Marek Kohn**, *Independent on Sunday*

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*"The Most Brilliant Anthropological Study Ever Written. The many words used to describe Chris Knight's 'Blood Relations' include, monumental, encyclopedic, brilliant, original, ingenious, and a tour-de-force. It is all of these and more! This work is simply the most brilliant and imaginative book about human cultural development ever written. Its range is astonishing. Its arguments are cogently made with great detail. Its synthesis of primatology, sociobiology, and anthropology are compelling. Where others have depicted women as the victims of a dominant male hierarchy, Knight reveals how the sex roles and behavior of both men and women developed together in a dialectic relationship. Where others have stressed the loss of oestrus and continuous sexual receptivity in the*

female, Knight spotlights menstruation and its associated marital and other cultural taboos. Where others stress man the hunter and woman the gatherer, Knight envisions paleo-women as evolving an increasing solidarity to shape the structure of both hunting and gathering. Women are not the passive creatures that are so often depicted by the radical feminists who have an interest in portraying women as the victims of dominant males. Females have been active participants in shaping culture, behavior, and human destiny.

Somewhere between 40,000 and 100,000 years ago, Knight believes, a massive social, sexual, and cultural explosion occurred and he does an ingenious job of providing us with insight into how this may have happened. A major change in reproductive strategy had to take place before males could take off as hunters and leave their women behind. Women synchronized their ovulatory cycles with one another; the concept of the "sex-strike" is the heart of the book. Blood as a symbol of menstruation provides a key to much of human culture and Knight uses it to explain the inner logic of many of mankind's myths and taboos. Because the disruptive effects of sex can be enormous, these controls have played an important role in the development of human culture.

The riches of this deeply learned book cannot simply be conveyed in a brief review. It is a work to be read over and over and contemplated. The many insights into human culture and the relationships among the sexes will surely provide any open minded person with a new perspective as to why we are the way we are".

**Anonymous**, Amazon.com (reviewer from Cincinnati, Ohio USA)

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"This book was a revelation to me. Having struggled through numerous turgid anthropological works by the likes of Lévi-Strauss, Róheim etc., it was thrilling to read such an ambitious clear-sighted and compelling account of the origins of human culture, together with an excellent critique of much current anthropological thinking. ....a wonderfully stimulating book".

**Mick Hartley**, Amazon.com

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"Ignoring this book is a mistake. It is a very readable, witty, lively treasure-trove of anthropological wisdom and insight.... Chris Knight has taken on the task of explicating not only the whys and hows of human cultural evolution, but also vast constellations of cultural behaviour covering Australia, Africa, Europe and all of the Americas. In this endeavour he is extraordinarily cross-disciplinary in his approach, utilizing insights from cultural anthropology, sociology, sociobiology and palaeo- and ethno-archaeology.

In short, Knight is a complete anthropologist, one who realizes the value of exploring all corners of his field to synthesize disparate work into a cohesive whole. His deep commitment to such synthesis should give pause to those of us who refuse to look outside our own areas of expertise for support or contradiction of our theories. His Marxist perspective, while of questionable practical value, is metaphorically rich. And his scholarship is impeccable. While many of us rarely bother to read 'the greats' of our field any more, Knight delves deep into Durkheim, Frazer and Lévi-Strauss and many others, coming up with long-forgotten insights and providing his readers with an enormously useful review of a century of evolutionary theory and ethnographic data....

In fact, as a feminist, I would very much like it if Knight's story turned out to be true, since it gives so much credit to women's collective solidarity, strike power and biological and intellectual creativity.... Best of all, it's a story that's 'good to think with'. It made me review in my mind everything I ever learned about evolution and rethink it in a new way."

**R. E. Davis-Floyd**, *The Journal of the Royal Anthropological Institute*

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"Revolutions in science seldom appear ready made.... But I suspect that the basis of a new synthesis between anthropology and biology may well lie within the pages of this book."

**Robin Dunbar**, *Times Higher Educational Supplement*

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"Imagine a time when women lived together, worked together, sang and danced together, and our lives, work rhythms, songs and dance rhythms were all governed by the cycles of the moon. Imagine a time when all our skins were dark, Europeans having newly arrived from Africa. Imagine a time when women had the power and solidarity to make men leave their warm hearth-sides, go out into the howling wastes of Ice Age Europe to hunt giant and ferocious mammoths and then transport their kills proudly back to the women's camp.

This is not a feminist matriarchalist dream. This happened somewhere between 60,000 and 40,000 years ago, according to the latest scientific account of human cultural origins given by male Marxist anthropologist Chris Knight in *Blood Relations*. The 'Human Revolution', as archaeologists call it, sparked an explosion of symbolic culture that was carried from Africa into Europe, Asia and all the way to Australia 40,000 years ago, and later all over the planet."

**Camilla Power**, *Everywoman Magazine*

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*"No, this is not another Man the Hunter origins myth, with man simultaneously inventing technology, culture and the nuclear family, and teaching it all to his dumb wife sitting at home with baby, waiting for the bacon. On the contrary. First it is not about Man or even Woman: it is about women organizing in solidarity with one another. Yes, it is about culture: how women's solidarity was at the core of it. And yes, it is also about the family: how women's solidarity exploded the 'natural family' of most primate societies, in which the females are the sexual possessions of the male or males. Knight argues that the first human societies were communist. For him, as for Friedrich Engels, this means something historically specific (and nothing whatsoever to do with the monstrosity of Stalinism). Communism meant a society in which women – as never before or since – were free. Women collectively said No to rape, and men obeyed. Responsibility for children belonged to the whole community. Women's rule – matriarchy – in this sense meant freedom for everyone. Language, co-operation and science replaced physical coercion, animal individualism, and the rule of genes."*

**Liz Dalton**, Sulfur Magazine

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*"Read this book and be changed. It is another of the great books of our time whose far-reaching influence in modern culture has not even begun to be felt. BLOOD RELATIONS is beautiful."*

**Earl Hazell**, Amazon.com

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*"Chris Knight has produced a book of absorbing interest. The author likens himself to the palaeoanthropological storytellers and it is a fascinating tale that he has to tell. His setting is some 40,000-45,000 years ago....."*

*Recommended for health sociologists and students, especially those interested in the gender order of society and in the social significance of biological processes. The book is a narrative, best read through from cover to cover, and this is an agreeable and thought-provoking task."*

**Agnes Miles**, Sociology of Health and Illness

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*"One of Knight's chapters is headed 'The Revolution'... but his whole book might well have had this in the title for his thesis has revolutionary implications for modern scholarship as well as hypothesizing a revolution in the remote past."*

**Emily Lyle**, School of Scottish Studies, University of Edinburgh

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*"A refreshing alternative to the plethora of prosaic and sexist variations on the 'Man-the-Hunter' theory of the origins of human culture."*

**Cris Shore**, Dept. of Social Anthropology, Goldsmiths' College, London

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*"Blood Relations is magnificent. Comprehensive in design, powerfully informed in execution – this book clarifies not only the problems of the past, but posits the need for a new cultural leap if we are to survive the present."*

**M. R. A. Chance**, Department of Anthropology, University College London

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*"Chris Knight in Blood Relations has this 'extraordinary resolve'. His is an immense work of documentation and close argument. For all its obvious risks, the model offers no hypothesis which is not rigorously testable. Not only this, but it appears to solve most of the outstanding conundrums in contemporary anthropology."*

**Peter Redgrove**, Times Literary Supplement

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*"Blood Relations points us all in a refreshingly new direction".*

**Clive Gamble**, Department of Archaeology, University of Southampton

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*"Encyclopaedic in scope, this is a seminal work that will certainly stand as a classic example of the application of the Marxist anthropological model to an examination of the origin of human culture...."*

**Choice**, American Library Association

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*“Chris Knight has a political agenda, and he is not going to hide it from us. He is a good Marxist (‘old fashioned’ as some readers are bound to conclude), believing in class struggle, trade-union activism, workers’ solidarity, and most of all in Engels’s version of primitive communism and the early matriarchate.... This theory is designed to cock a snook at every premise which sleeps undisturbed in our current assumptions.... The result is an exhilaratingly original edifice of astonishing range.”*

**Caroline Humphrey**, *London Review of Books* ([link to full text](#)).

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*“Blood Relations is an incredible work of scholarship, and in particular of Marxist scholarship – a vindication of scientific socialist theory at a time when Marxism is supposed to be dead. Here we have the actual proof that Marxist theory works. Not by ignoring facts that don’t fit – but by putting the facts first. The facts are sacred. The theory must fit the facts. We’re so used to having paraded before us Marxism and Marxism-Leninism as it was prostituted by the Soviet Union – where if the facts didn’t fit they were ignored – that we’ve forgotten what Marxism really means.*

*Chris’ book is based on the facts. These facts were well known within a variety of scientific disciplines – sociology, anthropology, archaeology. You look at these facts, and a lot of them seem completely inexplicable. They appear bizarre. Why do women co-ordinate their menstrual cycles? Why do so many religions have taboos on menstruation? Why do they have taboos on eating bloody meat? And this is not just in one or two societies, but all round the world, in societies which appear to have very little else in common.*

*Now, men were not very interested in these facts. They just seemed to be bizarre things that primitive societies did. Their importance is that they’re the key to understanding how we became human....*

*Chris’ theory may not be 100 per cent correct. But so far, it explains all the known facts. None of the other theories did. And I don’t think it’s too strong to say that in time to come it will be seen as significant perhaps in the way Darwin was seen as significant, in really changing the way we look at what it is to be human.”*

**Dorothy Macedo**, Campaign for Labour Party Democracy

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*“A quite remarkable contribution to our subject”*

**Marilyn Strathern**, Department of Social Anthropology, University of Manchester

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*“It may seem far-fetched, but Knight’s grand theory synthesises many disparate anthropological and archaeological observations....”*

**Chris Stringer**, London Natural History Museum

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*“From apparently modest beginnings, this is the most ambitious project on the origins of culture to have emerged for decades. The effort to establish a collectivist point of departure for the theory of human communication has had to struggle against the individualist assumptions that dominate cognitive science, but this very struggle makes the book original and important.”*

**Mary Douglas**, C.B.E., F.B.A., Yale University Press

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*“I suspect that it will be a slow burning classic, revived from time to time, but then discarded because it repudiates bourgeois metaphysics”.*

**Keith Hart**, Department of Social Anthropology, University of Cambridge

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*“As women all over the world fight for control over their own sexuality and fertility, Chris Knight in Blood Relations has performed a service. We can now prove that we’re demanding nothing new. We once had collective control over our own bodies; our fight now is to regain it.”*

**Leonora Lloyd**, Secretary, National Abortion Campaign

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*“Chris Knight is reconstructing a human revolution that occurred many thousands of years ago. Whether his argument is true or not I am not qualified to judge. But what I want to convey here is the excitement – and the quite extraordinary sense of homecoming and comradeship – which this magnificent book has caused me. But also relief, such relief: as if I am at last in the presence of an understanding which allows something hard and knotted and perverse and intrinsically unshareable, to unfold, stretch, breathe. The*

*release of tension as I read page after page of the detailed, passionate and ironic argument was extraordinary, and something for which I still feel great waves of gratitude."*

**David Holt**, Lecture to The Guild of Pastoral Psychologists

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*"This book is a revolutionary textbook for socialists and feminists. It turns upside down the reactionary developments in biology and evolutionary theory that dominated the 1980s.... Communism – the ideas of revolutionary change, of solidarity, of feminism and of a society organized for the benefit of everyone – is not only still the spectre that haunts Europe, but it is the very thing that created us as human beings...."*

**Keith Veness**, *Labour Briefing*

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*"How did human language and culture first emerge? The answer has now been found. It points us back to the very place where we all learned our craft. Human solidarity and culture began on the picket line."*

**Jim Perry**, National Union of Mineworkers

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## **APPENDIX B**

Responses to **Chris Knight, Camilla Power and Ian Watts**

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*"Neither Dunbar, Mithen, Donald, nor other important pioneers of the 'social' vision of early human development tackle the topic of kinship as a symbolically loaded, ceremonially structured, and linguistically influenced way of organizing sexuality and the raising of children within and between groups.... My final example of an evolutionary story, however, does tackle sexuality and kinship in a deeply structural and 'symbolic' way. Chris Knight has offered a vivid model of the way that cultural rules about social relations may have been consciously created in early human history. He starts with the assumption of a basic tension between the sexes, in which females begin to control their own sexuality over the menstrual-lunar cycle and use it as a way of bargaining with males over their success in bringing home meat from the hunt – also dependent on the phases of the moon. It is not so much a simple matter of all against all, but rather the formation of defensive coalitions of women and their close male kin around young girls, against the interest of non-kin males in the promise of new sexuality and fertility. Using a range of modern ethnography as a guide, Knight seeks the beginnings of ritual, specifically initiation ritual, in the richly symbolic performances of such coalitions, which enact a 'No!' to philandering potential partners by using red cosmetic body paint as a defiant cover to advertise their solidarity, and to conceal just who is menstruating and therefore imminently fertile, by presenting themselves symbolically as animals and even as males. Such rituals, at least their modern analogies, embody basic metaphoric associations such as between rain and fertility of the kind which we can see permeating 'art' and 'religion', and also construct social time in that they invest the seasons and the lunar cycle with tremendous significance. In this scenario of the periodic enactment of a counter-reality Knight sees the beginnings of symbolic culture and the political power of ritual, quite different from the low-key individual exchanges of ordinary speech which he argues would have developed more informally within ritually defined coalitions. This basic model has been taken further and elaborated by others, especially on the basis of comparative mythology from southern Africa. Archaeological evidence for the extreme antiquity of red ochre use has been adduced from the same region, and plausible arguments made for long continuities in the essentially symbolic ways it has been deployed. Knight's whole approach is essentially a bold guess, couched in an ambitious effort to explain the transition from animal to human society in directly Darwinian terms which not everyone would accept. Nevertheless he and his collaborators have seriously tackled the question of identifying what we might mean by organized social form and linked it crucially, as few others have, with the beginnings of art, ritual, language, and conscious direction in human affairs, including the logic of kinship and gender."*

**Wendy James**, Department of Social Anthropology, University of Oxford (excerpt from the *Ceremonial Animal*, pp. 30-31)

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*"Knight presents a powerful account of the transition to linguistic expression as a sequence of causes and effects. As human physiology evolved, especially brain-size, women were occupied with an ever-longer period of pregnancy and nursing. Consequently, they were increasingly dependent on their mates to provide food and protection, yet also increasingly vulnerable to their infidelity. Knight builds on previous proposals to suggest that this led to familial alliances between women, focused on rituals that confused the external signals of sexual maturity and availability and drew male family members into a collective responsibility for protecting all the women. The combined context of social pacts, egalitarianism, and ritual make-believe provided, he argues, a context for the development of language that was safe from the inherent dangers of deliberate deception."*

**Alison Wray**, Centre for Language and Communication, Cardiff University (excerpt from *The Transition to Language*, p. 8).

*"Watts (1999) argues that the ubiquitous presence of red ochre pigments at numerous African MSA (Middle Stone Age) sites indicates ritual activity. Noting a jump in ochre presence over time, he concludes that "the preoccupation with redness clearly indicates that ochre was primarily used for signalling" (1999: 128) and argues that "the habitual nature of such behaviour from the MSA2b onwards strongly suggests that the signalling was symbolic rather than solely indexical or iconic" (1999:137). The MSA Blombos Cave excavations of Henshilwood and colleagues lend further support for symbolic behaviors in African MSA populations. These researchers recovered twenty-eight bone tools dated ca. 70,000 years ago exhibiting "formal" techniques of bone tool manufacture, as well as ochre pencils and objects bearing geometric designs. They note that "bone tools are ... only one element of a range of techniques used at BBC during the MSA to produce practical and/or symbolic artefacts indicative of a complex technological society" (2001:668)... The widespread occurrence of red ochre pigments has been interpreted by Dunbar (1999) as evidence of "badging." He argues that red ochre badging increased during the African MSA in order to mark and identify group members when both the size and the number of groups were increasing. Yet, Dunbar notes that "external badges encounter a common problem ... they are easy to fake" (1999:202). If, however, red ochre badging is viewed within a broader context of ritual, as Watts and others (Knight et al. 1995) have interpreted it to be, then both the costs and the reliability of these badges increase, as well. Participation in ritual entails time and energy costs which may deter free riders (Irons 2001; Sosis 2003b). More importantly, participation in communal ritual provides the context for the creation and internalization of communally shared motivators... The red ochre, beadwork, bone incising and regional stone- and bone-working styles evident in the archaeological record of the African MSA between 250,000 and 50,000 BP all indicate an increasing importance of ritual, an intensification of costly signals, and the emergence of symbolic systems specific to social groups. The emergence of dance, music, and even language may have their roots in this intensification process".*

*C Alcorta and R Sosis, 2005. Ritual, emotion and sacred symbols. Human Nature, 16(4): 323-359.*