Crossing the Latest Line:

The Evolution of Religious Thought as a Component of Human Sentience

Christopher J. Corbally, SJ

Margaret Boone Rappaport

1. Human Sentience in Big History
2. Three Advanced Domains of Thought
3. Matrix Thinking
4. Religion as an Evolutionary Adaptation
5. Matrix Thinking for the Future

THE HUMAN SENTIENCE PROJECT©

Goals

(a) to pursue research and analysis of existing evidence for human sentience in the archaeological record, as well as evidence from laboratory testing in cognitive psychology, cognitive archaeology, and the cognitive study of religion;

(b) to engage in public speaking, in order to generate good discussion among individuals from a wide variety of disciplines who share an interest in human sentience and its origins; and

(c) to develop new formats and innovative approaches for education of youth, adults, and the public, including, for example: dramatic skits, interpretive dialogues, video presentations, web-based materials, and workbooks;

(d) to provide public education on common questions about evolutionary science and religion, and how to reconcile existing conflicts in the minds of many.

Margaret Rappaport
Chris Corbally

The Components of Sentience: General and Specific

Margaret Boone Rappaport and Christopher J. Corbally, SJ

Basic Components of Sentience for All Three Advanced Domains of Thought

- Consciousness
- Awareness
- Self-awareness
- Desire
- Will
- Personality
- Prudence
- Introspection
- Concentration without easy distraction
- Symbolic thinking
- Intelligence (intellectual, social, emotional)
- Social sensitivity
- Ability to anticipate the intentions of others
- Insight
- Sympathy
- Empathy
- Social sensibility
- Charity or values-based altruism
- Capacity to fall in love
- Ethics
- Wisdom
- Matrix Thinking

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Components of Sentience:

Scientific Thought

- Logic and the recognition of cause and effect
- Manipulation of symbols
- Conceiving a timeline
- Recognition of empirical data (even if fallacious) and assigning meaning to it
- Recognition of imperfectly similar events or objects (through comparison) and extrapolation to new cases
- Ability to form explanations
- Skepticism
- Numeric ability
- Geometric ability
- Multidimensional imaging
- Modeling and manipulating formulas
- Matrix Thinking

Components of Sentience:

Religious Thought

- Awe and wonder
- Belief in supernatural spirits or beings
- Adoration
- Reverence
- Obedience
- Endowing ritual with symbolic meaning
- Alignment, or continual comparison with a moral code; planning one's life according to that code
- Introspection, concentration, and meditation
- The habit of prayer
- Religious transformation, or ability to achieve a deep selflessness and be filled with a supernatural presence
- Achieving an ecstatic state (an altered state of consciousness) to interact with the supernatural
- Matrix Thinking

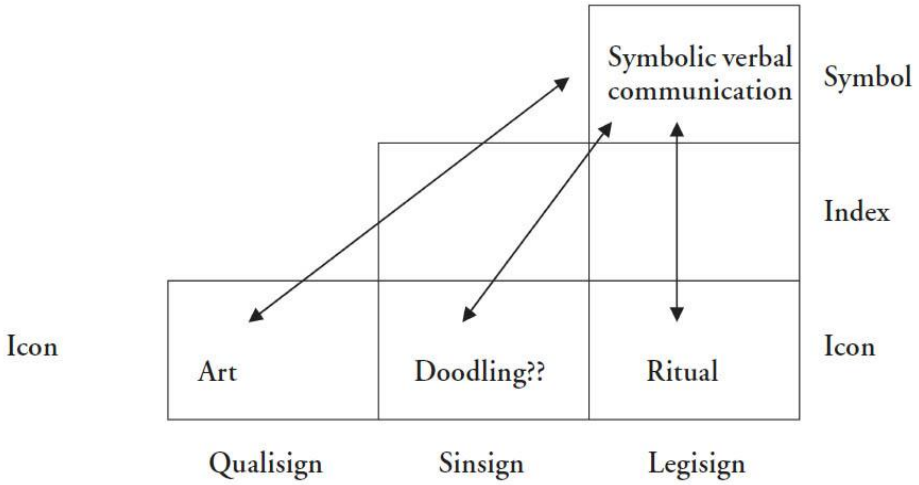
Components of Sentience:

Artistic Thought

- Pleasure
- Play
- Recognition of beauty (and genetic quality) in symmetry, especially of faces
- Recognition of beauty (and health) in color
- Recognition of beauty (and sexual receptivity) in form and contour
- Recognition of beauty in patterns of sound and movement (of people and objects)
- Recognition of beauty in composition and perspective, especially of landscapes
- Recognition of beauty in asymmetry and discordance
- Self-correction, continual editing
- Purposeful synesthesia, multi-sensory media, and discovery of new media
- Symbolic attachment of artistic features to science and religion; development of aesthetics
- Matrix Thinking

The Semiotic Matrix (Robinson & Southgate 2010, via C.S. Peirce) and Matrix Thinking

"The type of cognitive process we are referring to is that familiar to us in the use of diagrams and metaphors, both of which are kinds of icon that depend on symbolic representations and are in turn capable of generating new conceptual knowledge. Crossing this semiotic threshold – entering the semiotic matrix – opened up the possibility of art…and ritual… The important point is that these juxtapositions of signs would have consisted not merely of sequential combinations of signs but of a creative dialectic between different types of sign." [a]



MATRIX THINKING

Ability to discover new knowledge by "entering a semiotic matrix,"[a] using enhanced working memory,[b] and making good use of our socio-cognitive niche[c] and cultural ratcheting[d]

[a] Robinson and Southgate (2010). [b] Wynn and Coolidge (2011). [c] Whiten and Erdel (2012). [b] Dean et al (2012)

Evolution of Advanced Domains of Thought in Genus Homo

Christopher J. Corbally, SJ and Margaret Boone Rappaport

Basic Components of Sentience

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Self-awareness
Desire
Will
Personality
Prudence
Introspection
Concentration without easy distraction[b]
Symbolic thinking
Intelligence
Ability to anticipate the intentions of others
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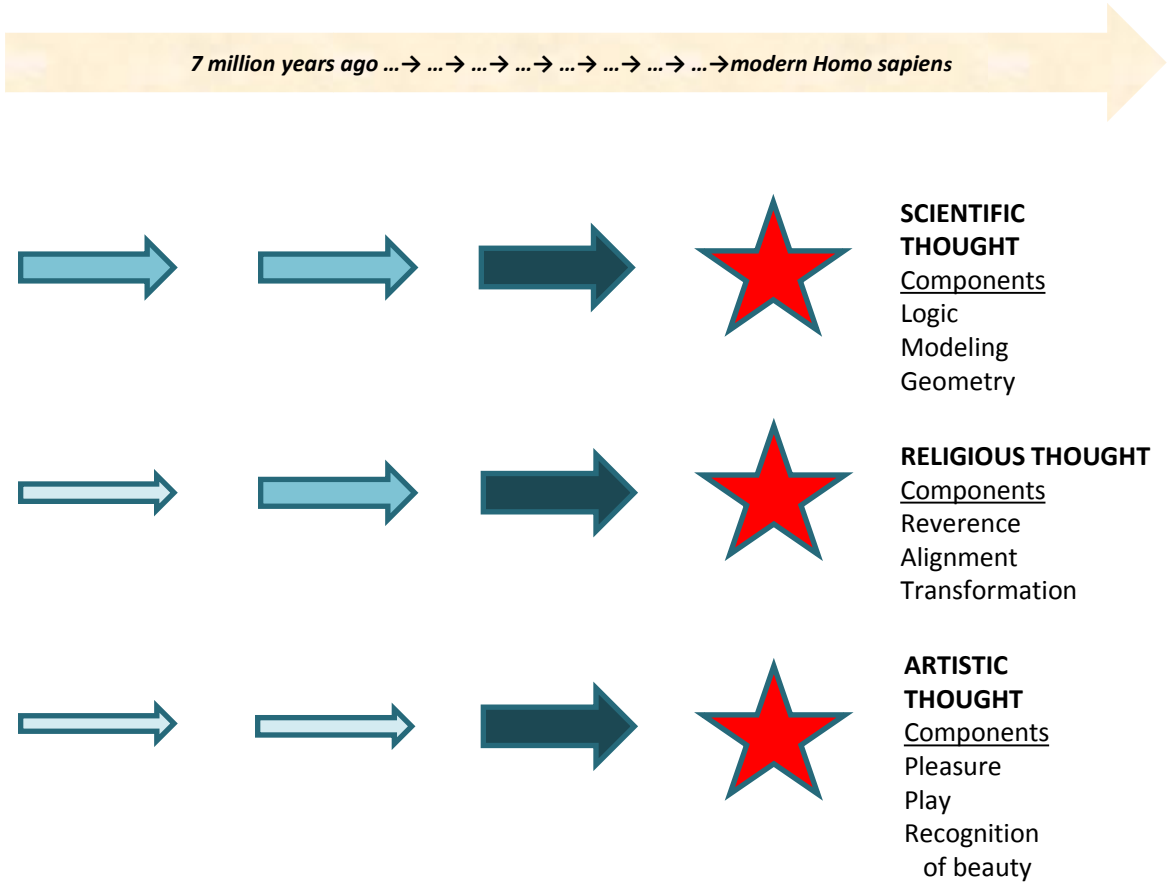

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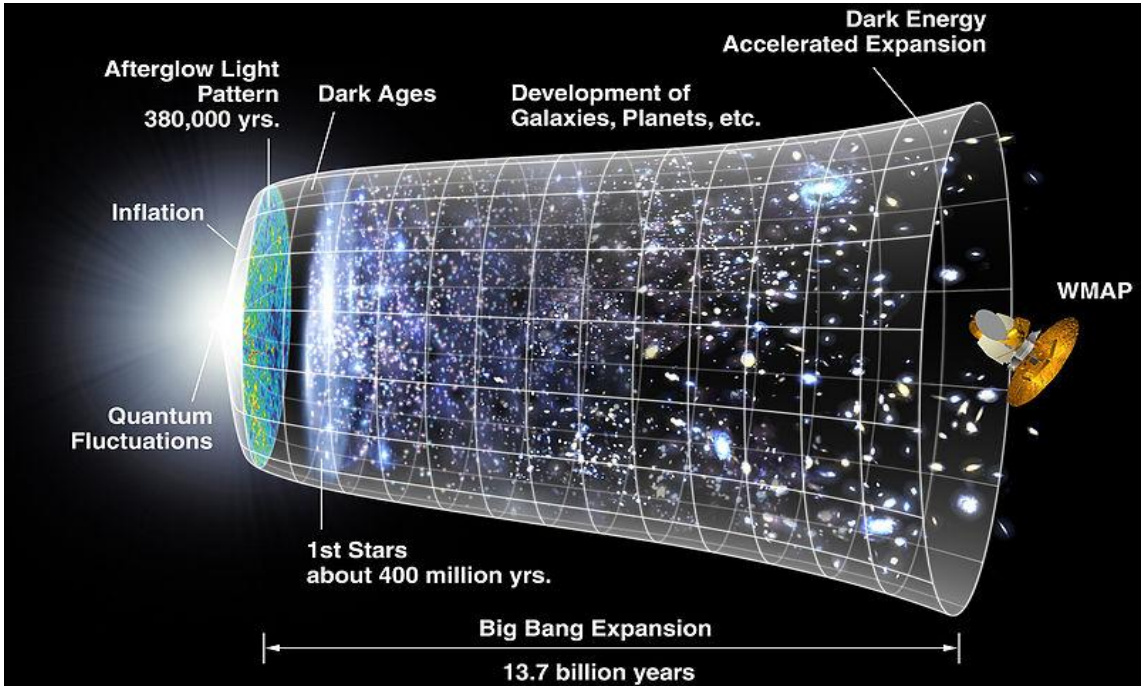


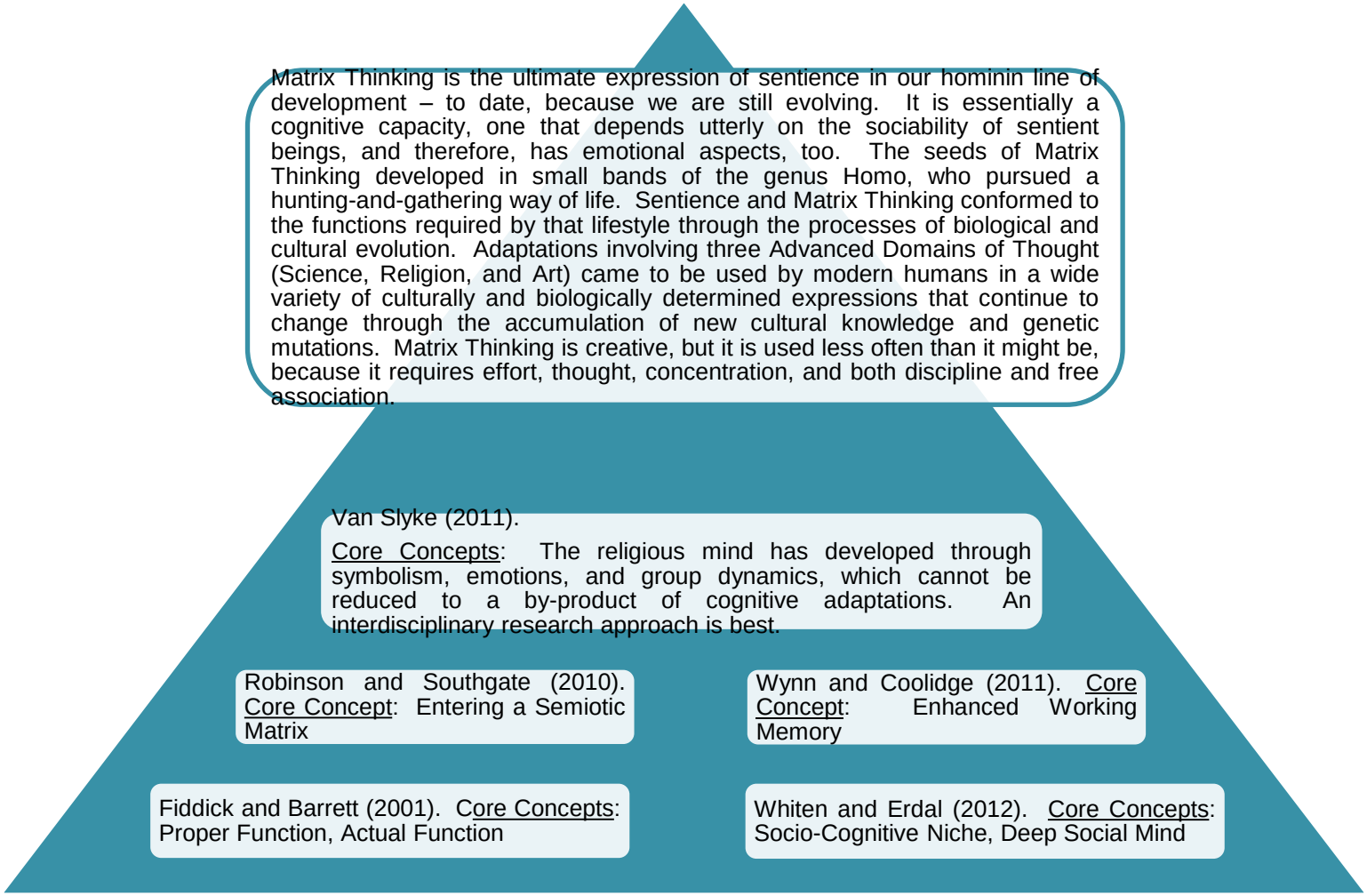
1. Human Sentience in Big History
2. Three Advanced Domains of Thought:
   Science, Religion, Art
3. Matrix Thinking
4. Religion as an Evolutionary Adaptation
5. Matrix Thinking for the Future Global Society

Thank You!

Global Society

Foundations of Matrix Thinking and the Origins of New Cultural Knowledge

Christopher J. Corbally, SJ and Margaret Boone Rappaport



N.B. "Matrix Thinking" is also a term also used in management training by Roger LaSalle, who contrasts it with "linear thinking." http://www.innovationtraining.com.au/Innovation_Training-La_Salle_Matrix_Thinking-Roger_La_Salle.html This is not the meaning we use, instead relying on a context of evolutionary biology, archaeology, and the cognitive sciences.

Matrix Thinking as an Evolutionary Adaptation

Margaret Boone Rappaport and Christopher J. Corbally, SJ

- Matrix Thinking requires a certain minimal brain capacity – both in size and complexity, including connections between parts of the brain that guide social and emotional functioning, and the more advanced prefrontal cortex used in reasoning and planning , where the so-called "executive functions" are located.
- Matrix Thinking involves systematically bringing together different kinds of symbols, not just signs, but all kinds of signs and symbols, as well as processes laid bare through introspection and observations of natural phenomena.
- Matrix Thinking involves the juxtaposition of symbols in a mind that can hold different types of concepts in the consciousness and focus upon their differences, similarities, and connections for an extended time without distraction.
- Matrix Thinking shares with its most common medium – human language – the virtually infinite *re-combinability of elements.*
- Matrix Thinking takes place within a world of social and emotional validation, and offers various satisfactions of intellectual, social, and emotional types. It is its own best reward for the working scientist, artist, and theologian.
- Matrix Thinking results in new models, new analogies, new creations that have new characteristics, which are either observed or manufactured, real or imaginary, naturally occurring or culturally invented.
- Matrix Thinking is a wellspring of new cultural knowledge for the coming Global Society, as we continue to evolve culturally and biologically ever faster.

Aspects of Matrix Thinking were suggested by many sources, including: Cochran & Harpending (2010); Fiddick & Barrett (2001); Robinson & Southgate (2010); Van Slyke (2011); Whiten & Erdal (2012); Wynn & Coolidge (2011).

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Test for the Status of a Capacity for Religion as an Evolutionary Adaptation

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Test Criterion	Results
Test 1. Is there an economy and efficiency of design in developmental mechanisms related to this capacity -- as expected from an evolutionary view of cognition? Is it easily and naturally acquired by children?	Learning any religion as a child is very easy. The type of Religion depends on the child's group. The notion of "God" comes naturally for children, even when they are not prompted.
Test 2. Are developmental mechanisms for this capacity flexible and able to accommodate a wide range of novel inputs at the same time that they have "functional specialization" or "special design"? Does it develop in efficient, precise, and reliable ways?	Religion is learned and flourishes as a coherent whole, in spite the vagaries of childhood development and often in the face of societal upheaval. Traditional religious stories can incorporate new and novel events in both childhood and adulthood, without challenging the integration of the whole. Religion changes, but it does so slowly. Its persistence, coherence, and consistency suggest the "special design" of a true adaptation.
Test 3. Is the adaptive nature of this capacity still clear when its development goes awry? The absence of which components of sentience prevent the adaptation's full development?	The Jonestown cult (Guyana, 1978) is an example of "religion going awry" due to a lack of introspection, discernment, ethics, and wisdom. While it had some surface features of Religion, it was not essentially "prosocial." It is true that Religion can be co-opted for Political goals (Third Reich, 1930s-1940s), but their alliance never last unless it is ultimately life-giving and group-enhancing.
Test 4. Which components of sentience appear most important in the full and adequate development of this capacity? Why and how?	Social components – insight into the self and others, social sensibility, and charity -- are used to encourage group participation as well as seemingly "personal" devotion. While the social components are most important, the most complex and inclusive components of Religion are ethics, wisdom, and symbolic inventiveness.
Test 5. Does this capacity make use of the information structure of the environment, so that there is reason to believe natural selection would favor it in early hominin environments? Are there cognitive mechanisms that could aid a mobile species accommodate to a heterogeneous and changing environment?	Not only does Religion encourage group participation in hunting and gathering, it incorporates many negative taboos to guard the wellbeing of group members. Furthermore, a mobile species makes certain locales "sacred," with practical consequences, like avoiding the contagion of dead bodies. Ritual cleansing symbolizes a purity of body, mind, and soul, and together, they confer physical and mental health, ideally.
Test 6. Are there cognitive mechanisms related to this capacity that impact reproductive success? Do they help hominins solve real problems in their environment, now and in the past? (As opposed to abstract laboratory skills that can seem unrelated to the real world.)	Religious participation and ethical decision-making enhance an individual's appeal to other group members, and aid, therefore, in the competition for sexual partners. Religion helps to drive and organize economic activity among all levels of society.

Test Criterion	Results
Test 7. The structure of an evolved capacity like Religion is explained most fully by its "proper" (original) functions, so it is necessary to envision problems among early hominins that could be solved by cognitive mechanisms related to Religion. What were the "proper" functions of Religion -- those which allowed it to be perpetuated over many generations and organize internally?	**Religion explains the origin of Man and the Cosmos, and reduces anxiety about poorly understood natural phenomena. It proscribes some behaviors and prescribes others. It helps to explain motivation and personality in other hunter-gatherers. Religion provides symbols of group solidarity and rationalizes the group's actions. It encourages obedience to leaders and the elderly, and values their knowledge and wisdom. Many studies show that Religion has potentially beneficial effects on brain function, anxiety, depression, and health.**
Test 8. Is there evidence that the human mind has domain-specific inference mechanisms for solving the sorts of problems that confronted our distant ancestors?	**Yes, but a great deal more information on the cognitive, perceptual, and emotional components of Religion will follow from laboratory results in psychology and observation of hunter-gatherer cultures.**
Test 9. Do the cognitive mechanisms related to this capacity continue to assist the human species today? How? Are there "actual functions" related to this capacity, or are traits better interpreted as either by-products or random?	**Religion continues to support group solidarity and individual humans in times of calm and crisis. It gives meaning to human existence and reduces anxiety. It controls, organizes, and gives vent to temperamental fluctuations in still-evolving populations, and provides a bio-cultural solution for characteristics of concern to society. It explains them, channels them, and provides succor. With its clear functional specificity, Religion is not a "spandrel" composed of independent features that evolved separately, but a complex integrated whole, whose central features are neither by-products nor random.**
Test 10. The hallmark of an adaptation is functional specialization. Is this capacity "functionally specialized"?	**Religion is effective in regulating human behavior within a flexible code that allows variation and explains deviation. Religion is remarkably persistent among all human cultures. It organizes activities according to a sacred calendar, making the seasons, sources of food, and human behavior seem more predictable.**
Test 11. Is there evidence of "special design"? Are cognitive mechanisms related to this capacity functionally complex and designed to solve specific problems?	**The ubiquity of Religion argues for its status as an adaption with "special design." It provides answers to pan-human questions, explaining the inexplicable, and organizing specialized components of sentience (awe, wonder, adoration, reverence, and sometimes ecstasy), to soothe humans in crisis, often using ritual (e.g., chanting and the rosary). Religion helps to organize and rationalize costly economic behavior and war.**
Test 12. Does the role of this capacity gain stature as an "adaptation" due to the large number of the "components of sentience" that appear in humans, but no other species on Earth?	**Yes, sentient hominins have *all* the components simultaneously and they're all related to Religion. Our closest relatives (the great apes) have a few, but evidence is very weak and fragmentary for sentience, cultural "ratcheting," and cumulative culture.[2]**

Tests suggested by material in: (1) L Fiddick and HC Barrett (2001). Evolution of cognition; An adaptationist perspective. *In*: NJ Smelser and PB Baltes, eds., *International Encyclopedia of the Social and Behavioral Sciences*. (2) LG Dean et al (2012) Identification of the social and cognitive processes underlying human cumulative culture. Science 335: 1114-1118