Mathematical and Scientific Philosophy

Indiana Philosophical Association Fall Meeting 2009

Saturday and Sunday, 5-6 December 2009
Indiana University Bloomington
Maple Room, Memorial Union
— Program —

Saturday, 5 December

9:10 Elisabeth Lloyd (IUB): *Bias and the Case of the Female Orgasm*

10:30 Kristopher Philips (Iowa): *On the Ontological Status of Species*
Commentator: TBA

11:30 Zhiheng Tang (Reading, UK): *The Contrastive Question and the Bottom-Up Principle of Causal Explanations*
Commentator: Curtis Sommerlatte (IUB)

12:30 *Lunch*

2:00 *Business Meeting*

3:00 Colin Allen (IUB): *How Hard is the Science of Animal Minds?*

Sunday, 6 December

9:10 Larry Moss (IUB): *Natural Logic and Semantics*

10:30 Arthur Ward (Bowling Green): *Against Formal Causation in Nonconscious Nature*
Commentator: Matt Carlson (IUB)

11:30 Michael Koss (IUB): *Reexamining Brouwer's Earliest Challenge to Classical Logic*
Commentator: Christopher Tillman (IUB)

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— Abstracts —

Colin Allen: *How Hard is the Science of Animal Minds?* A historical overview of the scientific study of animal cognition shows that it has often been motivated by the attempt to show how clever nonhuman animals are. Those who approach the questions in this way are often accused of improperly anthropomorphizing their subjects. It also leads to the charge that animal psychology is a "soft science". I add the further charge of "trophy hunting" to the recent attempts by scientists to show that animals are like humans in using tools, recognizing themselves in mirrors, etc. I argue that instead, we need a more theoretically motivated approach to understanding the diversity of animal cognition, and one that takes account more of the ways in which human cognition is not as clever as it sometimes seems. A unified account of the particular ways in which animals are intelligent and humans are not so intelligent is the best way of closing the apparent gap between human and animal minds. The resulting science will be hard in both senses: difficult yet potentially more rigorous.

Michael Koss, *Reexamining Brouwer's Earliest Challenge to Classical Logic*. Throughout his career, L.E.J. Brouwer offered arguments against the unrestricted use within mathematics of classical logical laws, especially the principle tertium non datur. We suggest that Brouwer's earliest such argument, from a paper published in 1908, is not targeted exclusively at the overturning of this principle. The argument is better understood as Brouwer's contribution to a contemporary debate, in which David Hilbert was involved, about whether every mathematical problem has a solution. We offer some reasons to prefer this interpretation of Brouwer's argument over a more common one. We also indicate consequences that this interpretation has for our understanding of Brouwer's later work on the foundations of mathematics.

Elisabeth Lloyd, *Bias and the Case of the Female Orgasm*. I present a case study in evolutionary biology of two sorts of bias in science: the theoretical bias known as adaptationism, and the social bias of androcentrism or male-centeredness. The particular case involves the evolution of female orgasm, for which over 20 distinct theories have been offered over the past forty years. I review some of the leading theories, focusing on one for which there is good evidence but little support, and one for which there is virtually no evidence but wide support. This state of affairs is a result, I shall argue, of little more than bias in evolutionary science.

Larry Moss, *Natural Logic and Semantics* A prominent feature of the formal analysis of language is the translation of fragments of language into first-order logic. Quine points out that "If we were to devise a logic of ordinary language for direct use on sentences as they come, we would have to complicate our rules of inference in sundry unilluminating ways." This talk presents work on logics for sentences close to the way they come. One leading idea is that the target logics for translations should be decidable, ruling out full first-order logic. We also ask what 'traditional logic' would have evolved into if it had the mathematical tools available to people like Frege. Although the talk has technical content, I'll try to emphasize the philosophical aspects of this ongoing work. The overall point is that the area can be illuminating and still has many open conceptual problems.

Kristopher Philips, *On the Ontological Status of Species*. I argue against the claim that 'species' can have genuine, mind-independent, ontological existence. The first section involves a modal objection to Ernst Mayr's 'biological species concept'. I then consider Ghiselin's and Hull's suggestion that species should be understood as spatio-historical individuals and argue that ultimately this description of species ends in the very essentialism that motivated the move away from classes. In the third section I re-introduce an age-old distinction from Aristotle and argue that his assessments of the nature of biological organisms and categorization are quasi-correct. The essentialist conception of species as spatio-historical entities is unproblematic *if* we understand them to be constructions of the human mind rather than the genuine 'joints' of the natural world. The aim of this paper is ultimately to give reason to believe that, regardless of what Mayr may suggest, realism about species *qua* mind-independent classifications is a position that must be abandoned.

Zhiheng Tang, *The Contrastive Question and the Bottom-Up Principle of Causal Explanations*. Recent studies have shown that the classic object of causal explanations, usually in the form of "Why P?" questions, where P stands for a proposition describing the explanandum event, is inadequate to capture some important features in our practice of causal

explanation. Instead of asking "Why P?" sometimes we ask "Why P rather than Q?" While Van Fraassen (1980) and Garfinkel (1981) first called attention to this kind of *contrastive why-question*, Lipton (1990; 1991) explores it in much detail and argues that we need to treat it quite differently from the classic explanandum.

Arthur Ward, *Against Formal Causation in Non-conscious Nature.* The problem of natural teleology in biology has traditionally focused on reconciling Aristotle's efficient and final causation. Aristotle, however, understood that formal causation was also an essential element in natural teleology, and this has gotten far less attention. In this paper I review the importance of formal causation in natural teleological explanations and suggest that undermining its legitimacy is a backdoor route to undermining natural teleology. Formal causation, I argue, represents the "phenotype" of an object, to use a familiar word from genetics. This means that formal causes specify not only intrinsic "genotypic" qualities of an object but also a range of environments in which the object is properly to inhabit. Such environmental specificity is possible through conscious activity, but is not found anywhere in nonconscious nature.

Driving Directions and Hotel Arrangements

Indiana University Bloomington

The conference will take place on Saturday and Sunday, 5 and 6 December, in the Maple Room of the Indiana Memorial Union (IMU), which is at 900 East 7th Street on the IUB campus.

The IMU features several restaurants and eateries. Here is a website for them:
http://www.imu.indiana.edu/dining/index.shtml

A number of rooms in the IMU hotel have been set aside for the Friday and Saturday nights, December 4 and 5, for conference participants who wish to reserve rooms. To make a reservation, you can phone 1-800-209-8145. Please mention that you are with the Indiana Philosophical Association when you call.

Other hotels and motels in Bloomington are listed on this website:

http://www.google.com/#hl=en&source=hp&q=bloomington+indiana+hotels+and+motels&aq=0&aqi=g3&oq=bloomington+indiana+hotels+&fp=1c443ffcb5a5cce1

Here you can find "google map" driving directions to the IMU:

http://maps.google.com/maps?f=q&hl=en&q=900+E+7th+St,+Bloomington,+IN+47405&ie=UTF8&z=15&om=1&iwloc=A

If you are driving to the IMU from State Road 37, it is easiest to get off at the exit for the 45/46 Bypass East (which is signposted for Indiana University) and turn right at the second stoplight, Walnut Street/College Avenue. Follow College Avenue; it is a one-way street, headed south into Bloomington proper. Then, turn left (east) on 7th Street and drive into the campus. In approximately 5 to 6 blocks, you will see the large IMU building on your right. You will come to a tollbooth in the middle of the street. Turn right at the booth into the IMU parking lot. The entrance to the IMU is through the revolving doors to your right. The Walnut Room is upstairs and to your left.

Conference participants can park in the IMU lot at a reduced rate by showing a conference badge when they leave. For participants who stay overnight in the hotel, parking is included with their rooms.