PhilInBioMed

THE MAGAZINE

- November 2020 -

This is not the end

Dear PhilInBioMed members,

After a long break, due to the corona crisis and a change of staff, we are coming back for one new edition of the PhilInBioMed magazine.

The frequency and regularity of this newsletter is still not implemented but we are really proud to see that the network is getting bigger and more and more of you make use of this plateform.

This encourages us to maintain the newsletter in a more regular way. We hope you will enjoy the read.

Cordially, your

PhilInBioMed Magazine team

A vaccine which can prevent 9 out of 10 people getting Covid-19? Although some questions remain open, the preliminary results obtained are even better than experts were hoping for. This good news raise hope for a return to a normal daily life.

To be continued...

Microbiota, symbiosis and individuality

Just over a year ago, the thought-provoking ERC IDEM summer school on "Microbiota, symbiosis and individuality" took place in Biarritz, France.

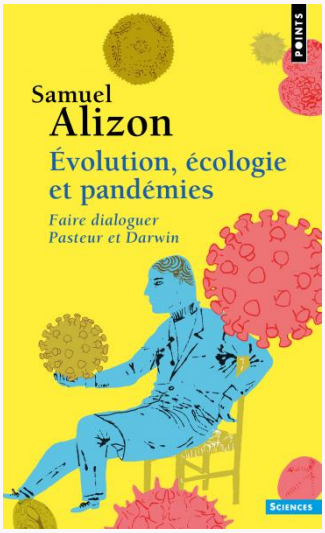
It brought together an interdisciplinary group of researchers, including many PhilInBioMed members, to discuss philosophical and scientific aspects of microbiota.

A number of early career attendees joined forces to write a meeting report (focusing on holobionts, individuality, causation, and human health) which was recently published in Microbiome (Open Access): https://doi.org/10.1186/s40168-020-00898-7

Please also see the short video abstract: link to the video

Gregor Greslehner

Establishing a dialogue between Pasteur and Darwin



How do infectious diseases arise? Why certain antibiotics stop being effective? What impact can a lifestyle change or public health policy have on the virulence of pathogenic agents?

In his book "Evolution, écologie et pandémies: Faire dialoguer Pasteur et Darwin" Samuel Alizon is discussing the importance and rapid evolution of microbes on the emergence of HIV, multi-resistant bacteria and the current Covid-19 pandemic.

His work leads to a better understanding of how to control infectious agents and find durable treatments by integrating two concepts: 1) The "Pasteurian" approach that focuses on the cellular mechanisms to give responses at an individual level and 2) The "Darwinian" approach that studies the population dynamics within their environements.

Samuel Alizon is a CNRS Research Director at MIVEGEC in Montpellier. He is an evolutionary ecologist specialised in modelling of infectious disease dynamics.

KLI virtual colloquium

The Konrad Lorenz Institute for Evolution and Cognition Research (KLI) is announcing the 2020/2021 virtual colloquia series.

The virtual colloquium is free and open to the public via Zoom. The calendar of events and poster of the upcoming talks are available on the KLI website.

The KLI would also like to invite members to subscribe to the weekly and seasonal newsletter.

Please follow this link to subscribe.

Essay on biological sex

PhilInBioMed member Paul Griffiths, recently wrote an artical on Aeon magazine. In this article the question: Why did sexes evolve in the first place? is raised.

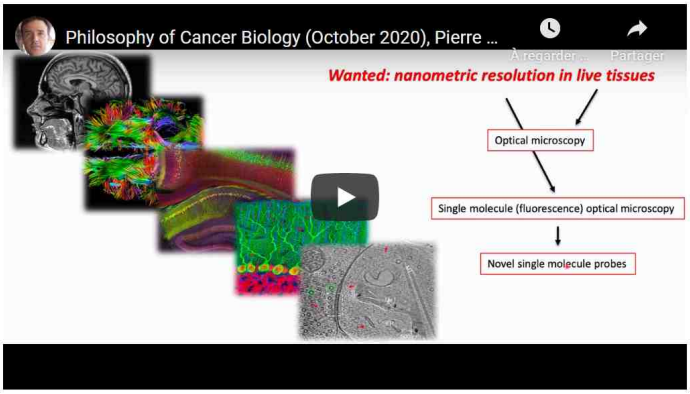
Not all species have biological sexes and biology seeks to explain why some do and others don't. Many species reproduce asexually, with each individual using its own DNA to create offspring. But other species, including our own, combine DNA from more than one organism.

You can have access to the complete article following the link: https://aeon.co/essays/the-existence-of-biological-sex-is-no-constraint-on-human-diversity

Unhinged

"Actually I don't read much, they're just background for my video calls."

Videos of The Third Philosophy of Cancer Biology Workshop



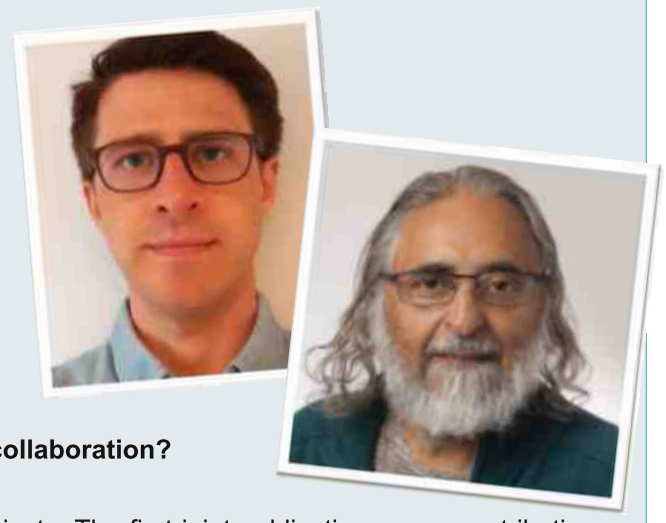
According to the World Health Organization, cancer is one of the main causes of death. The biological complexity and heterogeneity of this disease (or group of diseases) make it very difficult to apprehend, control and cure. For a long time, cancer has been little studied by philosophers of science.

Most of the work in the humanities and the social sciences has focused on the social, anthropological, psychological and ethical dimensions of cancer. Yet cancer is now becoming increasingly an object of study for philosophers of biology and philosophers of medicine. The third Philosophy of Cancer Biology workshop took place virtually one month ago. The workshop had great success and broght together philosophers of biology and philosophers of medicine.

The keynote speakers were Fanny Jaulin (Gustave Roussy, INSERM) and Andrei Seluanov (University of Rochester).

In case you missed the workshop the videos of the talks are available on the PhilInBioMed website: https://www.philinbiomed.org/event/third-philosophy-of-cancer-biology-workshop/

Collaboration chronicle: Explaining health across the sciences



Jonathan Sholl is a philosopher of medicine currently working at the CNRS & University of Bordeaux on the ERC grant about the microbiota and cancer. He was previously an assistant professor of medical philosophy at Aarhus University (Denmark) where he taught to both philosophy and medical students.

Suresh Rattan is a professor at the Department of Molecular Biology and Genetics at Aarhus University (Denmark). His interests and expertise include the biological basis and modulation of ageing.

Could you explain in a few words the topic of your collaboration?

JS: Our collaboration now spans a couple different projects. The first joint publication was a contribution to a book on biomarkers of aging, where we sketched ways to think about healthy aging. Together, we argued for a view of health that is characterized by the biological properties of robustness, resilience and allostatic load, with each of these further broken down into mechanistic, quantifiable biomarkers. It was meant to be our attempt to see how a scientist and philosopher could provide a measurable notion of health. The discussions we had when writing this short piece led us to working on a larger project about how and whether health is a scientific concept. With this main question in mind we compiled around 30 different perspectives—both scientific and philosophical—into an edited volume entitled Explaining Health Across the Sciences, which was just published recently. Hopefully such a project will lead to further reflections as to how to make health measurable.

SR: The focal point of our collaboration has been my struggle with understanding, defining and measuring health in cells and organisms, especially with respect to ageing. As a cell and molecular biologist, I have been studying the mechanisms of cellular ageing and replicative senescence, and trying to discover and develop possible interventions to maintain, enhance and/or recover health.

My collaboration with Jonathan resulted in a joint publication on Biomarkers of Health and Healthy Ageing, in a book on Biomarkers of Human Aging, (see:https://link.springer.com/chapter/10.1007/978-3-030-24970-0_4). In this article we tried to explore how a biogerontologist and a philosopher could combine notions of homeostasis, allostasis, homeodynamics, robustness and resilience, and create a quantitative framework for measuring health. This further led to us co-editing a book Explaining Health Across the Sciences, inviting philosophers, biologists, medical practitioners, psychologists, demographers, anthropologists and ecologists to address the issue of "what is health" in their respective fields (see: https://link.springer.com/book/10.1007/978-3-030-52663-4). We hope to develop further theoretical and experimental research on these issues.

How did you meet?

JS: We met in Aarhus, when I was working there. I had actually read some of Suresh's work on hormesis prior to going to Aarhus, and it was only once I was there that it dawned on me that we were both working at the same university. We also crossed paths occasionally since Suresh participated in the philosophy of medicine research unit meetings that I organized. One day, I reached out to him (or he reached out to me?) to have a lunch meeting to discuss his work on aging and hormesis, and we enjoyed it so much that we decided to make it a regular event.

SR: I met Jonathan when he joined Aarhus University and gave a kind of his inaugural lecture at his department's Philosophy of Medicine lecture series which I had been attending for some time. Jonathan, in his lecture, discussed his own previous work and new ideas on the philosophy of health and disease, and mentioned some of my papers on the concepts of homeodynamics and homeodynamic space that I have been trying to articulate. I was impressed by Jonathan's presentation and views, and I wanted to know him more. And so, I followed up on that first meeting by contacting Jonathan through emails, and then we started to meet over lunch at the Chemistry Department's canteen on a not-so-regular, but quite frequent, basis over the period of almost three years.

Could you each describe what your collaborator brings to this joint work?

JS: For me, it is humbling and enriching talking with scientists, and Suresh is no exception. He's quite knowledgeable about all things aging and so I enjoy being able to pick his brain and to be corrected. He's also quite interested in the philosophical and cultural dimensions of aging, so this shared interest made our collaborating easier in practice. In terms of the collaborating itself, he knows the possibilities and limitations of aging science on a rather intimate level and that helps to improve the kinds of questions we ask. Finally, his sense of humor always made the meetings enjoyable.

SR: Even while being a hard-core reductionistic experimental molecular biologist, I have always been interested in reading/learning about the philosophy of science in a non-professional manner, especially with respect to the wholistic/holistic understanding of the biological systems. Although my interest and inclination was generally not appreciated or encouraged by my own research colleagues and bosses, I started to attend various lectures and other activities at our university wherever philosophy of science and medicine was being discussed; and I even ended up giving a lecture about ageing, health and hormesis in one of their lecture-series organized by Uffe Juul Jensen (it was about a year before Jonathan joined our university). After meeting Jonathan and realizing that he also wanted to collaborate with real lab-based experimentalists, we started to discuss the possibilities of how to set new experiments in accordance with the philosophic ideas while using the methods of cell and molecular biology employed regularly in my labs.

For me it was the first time that a philosopher was showing interest and curiosity in the practical aspects of biological research, and was bringing in some novel ways of thinking and perhaps modifying some of our methods. We even planned to do some new experiments on improving and measuring health in human cells undergoing cellular ageing and exposed to various levels of physical and nutritional stresses in the lab conditions, which are still waiting to be done.

What are the obstacles that you have met during your collaborative work?

JS: I suppose most such collaborations run into language difficulties due to different background assumptions and ways of thinking. Philosophers are all too often trained to speak only to other philosophers, and this can trouble attempts to communicate across disciplines. We experienced this to some degree, but I never felt that it was a hindrance to our ability to collaborate.

SR: Coming from two very different worlds of academics, it once again became clear to me that the philosophers of science never, or very rarely, actually see/experience scientists in action; and that they have little or no realisation of the time, money, manpower and other resources and restraints integral to doing lab-based experiments. Moreover, my wish and plans to combine philosophy and experimental sciences (mainly biogerontology) never materialized as reflected in the repeated rejection of our grant applications both from the science-based agencies and from the so-called interdisciplinary agencies. That is why we ended up doing only theoretical work and collaboration so far.

Do you have suggestions as to how to improve collaborations between scientists and philosophers?

JS: I think trying to be clear from the start as to what the aim of the collaboration is can be rather helpful. For instance, what is the question that you want to ask? Why should a scientist be interested in your work as a philosopher? Just going up to a scientist and asking philosophical questions is probably not going to work.

Also, philosophers need to avoid the idea that scientists don't reflect much on the limitations or implications of their work. From my experience, scientists are quite often very sensitive to these issues, even if they don't raise them explicitly in their publications. Finally, while perhaps obvious, actually reading one another's work can be helpful – possibly more so on the side of the philosopher reading science.

SR: In my experience and opinion, having more mutual respect and acceptance is essential for such collaborations. Although some scientists, such as myself, do take the initiative to attend philosophy-based lectures and discussions, it is rare that it happens the other way around! Furthermore, differing traditions of communication, for example heavy citation/recitation of quotes and name dropping of "famous" philosophers creates distance and some feeling of being ignorant and illiterate in my mind as a scientist. And if as a scientist I try to "philosophize" my ideas in some bigger, wholistic terms, then most philosophers do not show any patience towards my non-professional articulation or give encouragement in that direction.Most scientists, on the other hand, reject the relevance of philosophical queries of their research questions as something far away from their immediate concerns (for example, raising funds, solving specific problems, and making publications etc.), and also because the dominant model of doing experimental science generally does not give any credit/recognition/respect to such initiatives, except for some lip service.

What are the most exciting questions that you would like to address in your future collaborations?

JS: We haven't really discussed too much by way of future collaborations, but Suresh has invited me to contribute to an edited volume on nutrition and food, which we both share a great interest in. I think developing some of the many philosophical problems with nutrition science might be one area where I could see some future collaborations. Another area could be to dig deeper into one of his favorite topics of hormesis and really see how to apply it in a clinical setting.

SR: After more than 40 years of my involvement in research, teaching and communication of the biological issues of ageing, health and longevity, the most exciting questions for me are how to develop objective measurable markers of health within the concept of homeodynamic space; how to promote healthy lifestyles without using the fear-tactics of diseases; and why to promote health, healthspan and lifespan, and for how long?

Another area of thought and experimental research that since 1996 or so continues to occupy and challenge me is the biphasic relationship between stress and health – known as hormesis. Are there any philosophical and ethical issues as regards the application of stress as a health-beneficial tool? It is in this context that my recent initiative to compile a book on Nutrition, Food and Diet aims to cover these issues from a purely molecular mechanistic to the cultural and individualistic understanding and applications. Jonathan has accepted my request to address this issue from a philosophical perspective. Furthermore, I want philosophers to take active part in the publication activities of biogerontologists, and that is why I have now invited Jonathan to join the advisory editorial board of our journal *Biogerontology* (published by Springer Nature, with me as its founding editor-in-chief, since 2000).

Exploring identity

Who am I? Maybe one of the oldest and boldest of metaphysical questions.

The Laboratoire d'excellence LabEx 'Who Am I?' is a large interdisciplinary consortium that took on this audacious quest, setting out to explore aspects of identity at the molecular, cellular and organism levels. This ambitious project has just published their first book "L'identité: Dictionnaire encyclopédique" (published by Gallimard) that discusses identity from many different angles.

Each entry tackles a question of identity from the point of view of a different discipline. From the genetic ('ADN' or DNA) to the literary ('voix'), the dictionary takes us on a journey through a lexicon of identity notions. The book begins with a series of introductory chapters that set the context seen from the view of philosophy, sciences, biology, medicine, neuroscience, psychology, sociology, linguistics or literature.

The scientific committee, working under the guidance of the late Jean Gayon, brought together experts from a wide range of disciplines: Alain Berthoz, Virginie Courtier, Vincent Descombes, , Béatrice Godart-Wendling, Marc Hersant, Cyril Lemieux, Antonine Nicoglou, Alexandre Peluffo, Gaëlle Pontarotti, Sarah Troubé, François Villa and Jonathan Weitzman. Together they supervised the work of over 120 contributors.

Recent publications

- Taming Fitness: Organism-Environment Interdependencies Preclude Long-Term Fitness Forecasting
G. Doulcier, P. Takacs, P. Bourrat, *BioEssays* (2020).
- Character identity mechanisms: a conceptual model for comparative-mechanistic biology.
J. DiFrisco, A.C. Love, G.P. Wagner, *Biol Philos*, 35, 44 (2020).
- The role of host environment in cancer evolution.
E. Solary, L. Laplane, *Evol Appl*, 13, 1756– 1770 (2020).

3 questions for Jonathan Fuller

Jonathan Fuller is a philosopher working in philosophy of science, especially philosophy of medicine.

He is an assistant professor in the department of History and Philosophy of Science (HPS) at the University of Pittsburgh and a research associate at the University of Johannesburg.

He is also deputy editor-in-chief of the journal *Philosophy of Medicine* and secretary of the *International Philosophy of Medicine Roundtable Scientific Committee*.

1. What sparked your interest in philosophy of science?

I became interested in philosophical questions about science during my undergraduate degree studying biomedical science at Western University.

I recall counting cells in a neurobiology lab as a research student and feeling puzzled about the seeming arbitrariness of a p value of 0.05, and also wondering how we could extrapolate findings from the rat and mouse models with which I was working with to humans, especially with respect to complex behavior. But I was set on medical research and clinical medicine and I had never heard of 'philosophy of medicine', so I began a combined MD-PhD degree at the University of Toronto with the intention of pursuing a PhD in neurophysiology.

One day, I stumbled upon philosophy of medicine while browsing through profiles of philosophers at Toronto's Institute for the History and Philosophy of Science and Technology. I came across Ross Upshur, a clinician-philosopher in Toronto. One summer research project later and I decided to switch my field from science to philosophy of science. Several years later and I decided to hang up my stethoscope for a career in academic philosophy.

2. What is your main research focus?

My main research interests lie in the metaphysics and epistemology of medicine. In particular, I have thought about contemporary epidemic diseases (including infectious diseases, but especially noncommunicable and chronic diseases, the 'new epidemics') as well as medical evidence. On disease, I have worked on the metaphysics of chronic disease, models of disease causation and classification, and explaining and intervening in epidemics from a population perspective.

On medical evidence, I have worked on the problem of extrapolation from clinical trials, causal inference in clinical trials, the role of meta-research in clinical reasoning, and the concept of individual risk in medicine.

My larger project is currently a book in philosophy of medicine, tentatively titled The New Modern Medicine, about the conceptual and epistemic features of today's medicine that are distinctive compared to medicine of 100 years ago. I argue that our model of medicine has evolved due to such Twentieth Century developments as the maturation of epidemiology, the rise of chronic and noncommunicable diseases and the arrival of evidence-based medicine. I explore the contours of 'the new modern medicine' and analyze eight problems for contemporary medical science and practice, including 'multifactorial' thinking and the poor reliability of therapeutic evidence.

3. What are topics you would like to explore in the future?

Lately, I have been thinking and writing about the current pandemic, especially the uses and limitations of epidemic models and the different scientific perspectives being brought to bear on science and policy. I plan to continue to think about the sources and nature of scientific disagreements in the pandemic and how philosophy can help us understand them (and perhaps even aid in their resolution?!). I am also putting together a series on 'pandemic philosophy' for The Examination Room, the public philosophy section of our new journal *Philosophy of Medicine* (pitches can be sent to: JPF53@pitt.edu).

Looking ahead, my next major research program will focus on clinical reasoning, especially diagnosis. There are many relatively unexplored questions here, including about the aim of diagnosis, diagnosis and explanation, the logic of diagnosis, the semantics of diagnostic claims, and the reality of contested diagnostic categories. My current project involves developing a pragmatic theory of diagnosis to account for the highly practical aims of the diagnostic process and as an alternative to a more explanatory account of diagnosis. I also have unexplored interests in the philosophy of psychiatry, especially the metaphysics of mental disorder. I would like to understand what mental disorders are, whether they are 'brain disorders', and in what sense psychiatry resists the 'biomedical model'.