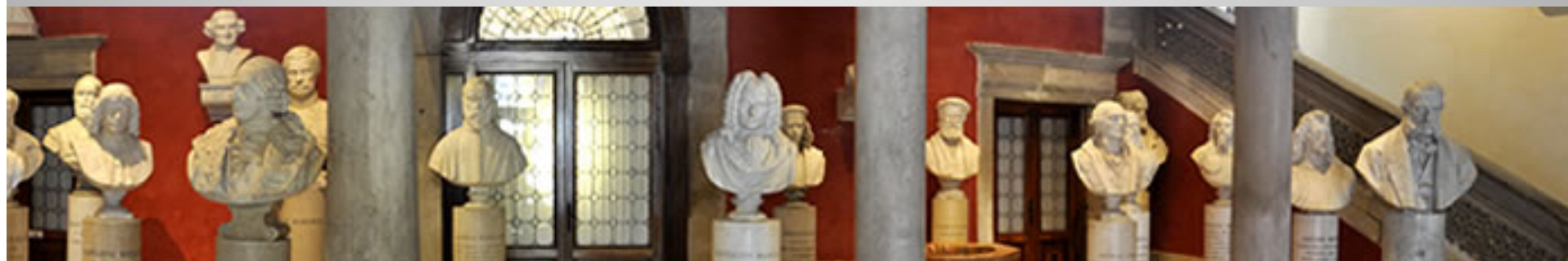




Istituto Veneto  
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ed Arti

Introduction (cont.) – Thomas Pradeu



**Why would philosophers be interested in development?  
(And why would developmental biologists care about what philosophers have to say?)**

- Scarcity of philosophical work on developmental biology.
- 4.5% in *Biology and Philosophy*.
- Of course, significant exceptions.

Amundson, Bolker, Brigandt, Burian, Griesemer, Griffiths, Laubichler, Love, Maienschein, Oyama, JS Robert, Wimsatt, etc.

- Mainly: evo-devo (& historical approaches)
- Research group on PDB at IHPST Paris: in reaction to this landscape.
- Surprising scarcity, as developmental biology:
  - is full of fascinating concepts deserving detailed analysis
  - raises many fundamental philosophical questions.

## Statistical expression of the different biological fields in *Biology and Philosophy* from 2003 to 2013

	Total 2003-2013 %
Evolution	33
Systematics and species problem	5.9
Human evolution	15.2
<i>(Total evolutionary studies)</i>	<i>(54.2)</i>
Ecology	2.8
Genetics	4.2
Development	4.5
Psychological and cognitive sciences	9.95
Neuroscience	3.2
Biochemistry	1.15
Cell biology	0.45
Immunology	0.3
Microbiology	2.85
Medical sciences	2
Physiology	0.45
Systems biology	0.2
Plant biology	0.45
Causality, reductionism, emergence, theories-models, laws, mechanisms	8
Others	5,4
<b>Total</b>	<b>100</b>

From Pradeu (*in prep*) *Biologies and Philosophy*

- Concepts deserving detailed analysis (both historical and philosophical):

Bauplan, canalization, development, differentiation, epigenesis, field, form, gradient, growth, homology, induction/inducer, information (genetic, positional...), metamorphosis, module, morphogenesis, network (e.g., GRN), plasticity, programme, regeneration, regulation, robustness, etc.

- Fundamental philosophical questions:
  - In general philosophy: causation, determination & determinism; innateness, nature/nurture, internalism vs externalism (Godfrey-Smith 1996); human identity (e.g., E. Olson, fetus)
  - In phil of bio: biological information, role of genes, genetic programme; reductionism; mechanism; the place of functional bio + articulation with evolution.

- Addressing these questions and challenges requires a **close collaboration** between scientists and philosophers.
- With Sandro: volume *Towards theory dev*, this workshop, etc.: an attempt to bring together biologists interested in conceptual and theoretical issues, and philosophers interested in better understanding developmental processes.