

Research and the teaching of Developmental Biology in Belgium

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In Belgium, teaching and research in the field of embryology are carried out exclusively in the universities. Although there is a national research foundation (Fonds National de la Recherche Scientifique), its mission is to assign research funds and allocate operating and equipment grants. It does not have its own research institutes. The creation of human, animal and plant embryology laboratories therefore depends entirely on the decisions made by the universities, on the curriculum adopted by each and, finally, on the legislation governing university curricula.

During the current academic year (1991-1992), in every region of the country, the academic curricula of each Science and Medical School is still governed by the National Law of September 11, 1933 concerning the protection and equivalence of higher education degrees and program of university examinations. It should be stressed, however, that this is a transitory situation now that Belgium is embarked on a constitutional process of federalization. As of January 1989, education is a «Community» matter, meaning that all legal decisions taken in this sphere correspond to the respective governments of the Flemish and French Communities. It is therefore possible that in the future the educational systems of the two Communities in Belgium will begin to diverge. So far, the French Community has, by means of a Decree issued on May 31, 1989, caused the National Law of September 11, 1933 to become a Community Law, although its contents have not been changed. The Flemish Community, on the other hand, issued a Decree on June 12, 1991 declaring the contents of the National Law null and void as far as university studies were concerned. The Community has not yet published its new curricula, however. In the meantime,

education continues to follow the traditional lines that will now be outlined in the remainder of this article.

In Belgium, university education is structured as a pyramid of three cycles. The first cycle is called *candidature*, in French, or *kandidatuur*, in Flemish, and takes two to three years to complete. It provides the student with the basic learning he/she will need in order to continue on to the second cycle, called *licence/licentie* in the Faculties of Science (2 years) and *doctorat/doctoraat* in the Schools of Medicine (4 years). The third cycle (1 or 2 years) consists of highly specialised courses, open only to university graduates. Human Embryology is one of the nine obligatory subjects in the first cycle of Medicine. Domestic Animal Embryology is one of the thirteen obligatory subjects in the first cycle of Veterinary Medicine. In the Science Faculties, Embryology is not obligatory during the first cycle, but elements of embryology often form part of general Biology courses. In contrast, Animal Embryology is obligatory during the second cycle of Zoological Sciences, while Plant Embryology must be taken by students enrolled in second cycle of Botany. A first-cycle diploma in Biology enables the student to continue on to a second-cycle degree in Botany or Zoology, but there is no second-cycle degree in Biology. The law does not stipulate in which year of each cycle the different subjects should be taught nor the number of hours that should be devoted to each subject.

Most of the developmental biology laboratories created in the Science Faculties and Medical Schools owe their existence to these courses. Their evolution over the course of time has always depended on local human and material resources, as is the case with all human endeavours. Table 1 gives a list of the persons in

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charge of teaching and/or research units within the field of developmental biology at the different universities. As can be seen, many of them are the authors of papers published in this special issue. Every effort has been made to ensure that the list is complete, but if anyone has been left out, we hope that he/she will forgive this involuntary oversight.

Since there is no Developmental Biology Society in Belgium, the Belgian Cell Biology Society serves as an intermediary for contacting international societies in the field of embryology. However, the specialists know each other fairly well. They get together at the country's other scientific societies, where meetings are often held in English! Political reasons make collaboration between laboratories in the North and South of the country difficult, but relations remain friendly, despite linguistic and philosophical differences.

One of the reasons for this cordiality is probably the fact that most of these specialists belong to a single scientific family, which traces its origins back to the University of Liège. They are, in effect, the spiritual descendants of Edouard Van Beneden, the discoverer of meiosis, himself the pupil of Theodor Schwann, the German founder of the cell theory who was appointed professor of the University of Liège (see the article by G. Hamoir in this issue). Albert Brachet, one of Van Beneden's pupils, founded the brilliant School of Embryology at the Faculté de Médecine of the Université libre de Bruxelles (see the article by J. Mulnard in this issue). Graduates of this School include J. Fautrez, who founded the embryology laboratory at the University of Gent, and his pupil, Lucien Vakaet, who set up the anatomy and embryology lab at the University of Antwerp before

succeeding to Fautrez' post at Gent (see the interview with Professor L. Vakaet in this issue). Albert Brachet's son, Jean Brachet, migrated to the Science Faculty of the University of Brussels. There, together with Raymond Jeener and his first students, he created the Department of Molecular Biology, which is still going strong today, along with others in the field of Developmental Biology (see the article by H. Alexandre in this issue). Jean Brachet, to whose memory this volume is dedicated, was not only a remarkable researcher and organizer of European research projects, but also an outstanding professor and humanist whose open-mindedness and warm generosity left an indelible mark on all who came in contact with him.

Despite the precarious financial situation in Belgian universities, especially as far as basic research is concerned, it should be stressed that research in developmental biology has remained high, both in quantity and quality, as we hope this volume will testify. We feel that two new phenomena have marked this research over the past fifteen years. Achievements in mammalian embryology have been outstanding, in both basic and applied research in Medicine and Veterinary Medicine (see review articles by Mermillod *et al.* for cattle embryos and Englert for human embryos). Secondly, developmental genetics has made its appearance in studies on the morphogenesis of both plants and animals especially the nervous system (see review article by A. Ghysen). The powerful tools provided by contemporary genetics will undoubtedly help elucidate the mysterious mechanisms causing the fertilized egg to become an oak, a fly or a man. This is one of the promises held in store for us by the third millennium.

APPENDIX 1

Flemish Community

UNIVERSITIES	MEDICINE *VETERINARY MEDICINE	ANIMAL BIOLOGY	PLANT BIOLOGY
Universiteit Antwerpen	M. Callebaut F. Harrisson	F. De Vree	J.P. Verbelen
Vrije Universiteit Brussel	F. Roels	–	D. De Kegel M. Jacobs
Rijksuniversiteit Gent	L. Vakaet A. De Kruif*	L. Vakaet	P. Van der Veken W. Van Cotthem M. Van Montagu
Katholieke Universiteit Leuven (en Kortrijk)	H. Verresen	A. De Loof	J. Vendrig A. Van Gool

French Community

UNIVERSITIES	MEDICINE *VETERINARY MEDICINE	ANIMAL BIOLOGY	PLANT BIOLOGY
Université Libre de Bruxelles	J. Milaire J. Mulnard F. Leroy Y. Englert	H. Alexandre C. Chaudière-Dambly A. Ghysen R. Tencer P. Van Gansen	J. Homes
Université Catholique de Louvain-la-Neuve	J. Picard P. Evrard A. Massip* F. Dessy*	J. Picard	P. Moens
Université de Mons-Hainaut	E. Baeckeland	E. Baeckeland	–
Université de Liège	E. Baeckeland J.M. Foidart F. Ectors*	E. Baeckeland M. Chardon G. Goessens	G. Bernier C. Van de Walle R. Bronchart
Facultés Universitaires Notre Dame de la Paix à Namur	R. Leloup A. Goffinet R. Wattiaux	M.F. Ronveaux-Dupal	P. Van Cutsem