

Lucien Vakaet, an avian embryologist

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Lucien Vakaet was born on January 28, 1926, in Balegem, a small village about 20 km from Gent, where he grew up among an affectionate family. His father, a Station Master, was a strong personality who deeply influenced young Lucien, and the precision of his scientific work is probably partly due to his early education. He did his undergraduate studies in the Royal Atheneum of Aalst in the Greek-Latin section, which at this time was the open road to university studies. Indeed, he went on to brilliant studies at the University of Gent Medical School from 1944 to 1951. From as early as 1944, he was active as a student assistant in the Laboratory of Prof. J. Fautrez, where he started his observations on the oogenesis of *Lebistes reticulatus*, carrying on simultaneously his teaching and learning duties.

During his military service (1951-1953), he worked as a doctor, an activity he never completely abandoned. However, he needed to continue his research, and so, in 1953 he became an assistant in the Laboratory of Prof. J. Fautrez. He forged close contacts with the Laboratory of Prof. A. Dalcq in Brussels and completely fell in love with the chicken embryo—a story which is told in the following interview.

In 1965, when the Rijks Universitaire Centre of Antwerp (RUCA) was founded, he was among the fathers of this new University, where he became Professor of Anatomy and Embryology, sharing heavy administrative and teaching functions. Meanwhile, with his new collaborators, he took up his research in the field of avian embryology. But he went back to his beloved home town of Gent in 1983, when he succeeded Professors J. Fautrez and K. Diricksen as Professor of Embryology and Anatomy in the Faculty of Medicine, where he had lived so happily as a student in earlier days.

Recently, in 1991, he retired as a Professor. But his scientific

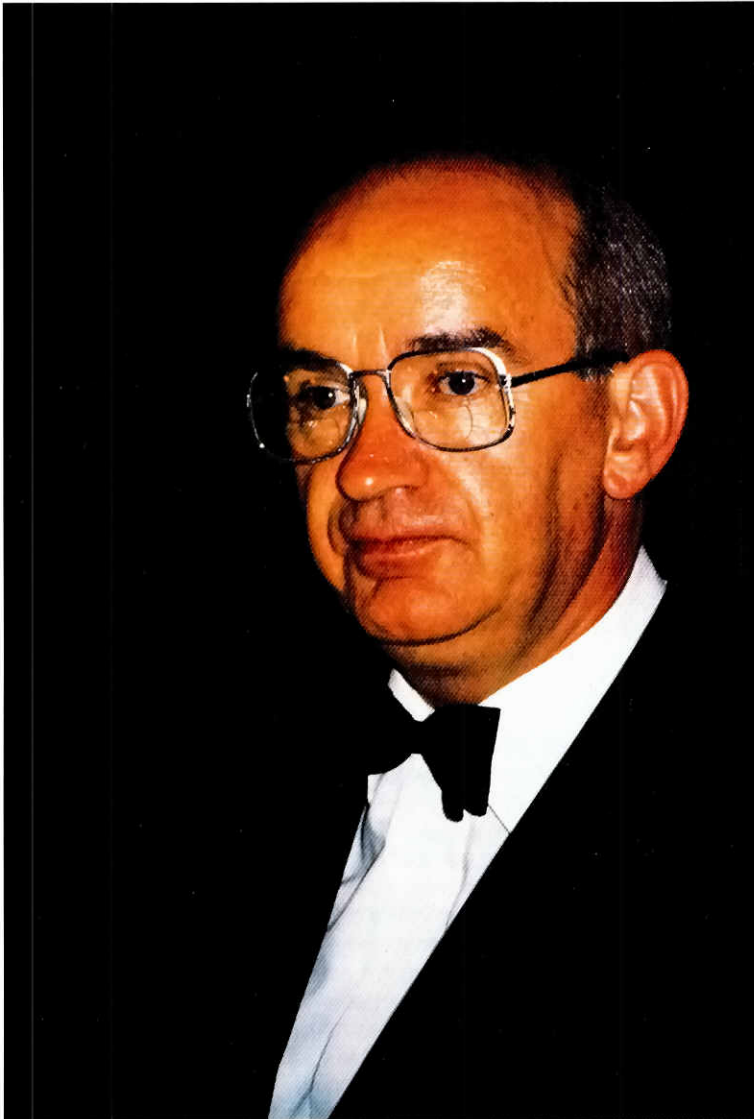
activities continue: he is now a scientific collaborator of the Laboratory of Experimental Cancerology of his former student, Prof. M. Mareel. And he still acts as physician for a few patients, who are «more friends than patients», as he told me recently.

Along with J. Brachet and J. Mulnard, Lucien Vakaet is also one of the founders of the Belgian Society of Cell Biology, which gathers many scientists working in the different fields of biology, including the field of developmental biology. He was the Society's Secretary from the date of its founding in the early sixties until about two years ago. He is a hearty, cheerful personality who has enthusiastically taught embryology and anatomy to thousands of students throughout his life. He loves to joke and to take part in discussions, and is able to do so fluently in three different languages—Flemish, French and English. He is obviously the leader of embryology in the Flemish Community of Belgium, a popular scientific figure of national standing and an outstanding avian embryologist at the international level.

As an MD, did you drop your medical practice early on, or did you find your profession attractive?

I was born to be a physician, my mother told me. How she knew is not elucidated. I preferred philology. When I started medical studies, it was with the illusion that they would reveal to me the whole human being. While I gradually learned how limited our medical knowledge is, I grew more and more interested in the normal human. I made the final choice reluctantly. I never lost contact with patients, however. From a brief period of activity as a physician during my military service, there are even some rare individuals who still take the risk of consulting me.

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Prof. Lucien Vakaet (b. 1926).

What caused you to end up in experimental embryology?

After I decided to do research, I soon realized that the normal human being is also too broad a field to be fully understood. As I wanted to master my field completely, I had to make a choice and I preferred anatomy to physiology: *Humani corporis fabrica*. While it is more or less possible to learn everything known about human anatomy, it was soon evident that research cannot cover that field. As I persisted in wanting to grasp the whole of my study object, I turned to embryology and more particularly to avian embryology. But also this field had to be restricted: so I dropped organogenesis and turned to pregastrulation and gastrulation.

But why avian embryos?

Because at young stages, they offer many advantages. One of them is to be almost bidimensional. But this story is not triumphalistic: although the avian embryo during gastrulation is only 3 mm² in surface and 0.1 mm thick, I still do not understand everything about it.

I realized that I never would when I moved back to Gent from Antwerp. As not much time was left, I concentrated my curiosity on those hallmarks of life, shape and movement. Instead of trying to solve problems, I endeavored to reduce their number by showing the similarity, if not the identity of many.

Who are the mentors that influenced your career and guided your first steps in embryology?

My masters have influenced my orientation especially by providing me with the arguments I needed to convince my family to agree with what I wanted to do. Prof. J. Fautrez was a charismatic teacher who attracted many students. I was the only one among them to do almost exclusively embryological research. An argument in favor of that choice was a rhetorical question posed by Prof. Fautrez: if you can earn your livelihood by doing what you would always like to do as a hobby, why not do it? I liked embryology.

The figure of Prof. A. Dalcq has influenced me profoundly. I consider him my scientific godfather. He believed wrongly to have

converted me to embryology, on a long train trip to Utrecht in 1951, but the decision to try and follow in his footsteps had been taken long before. Maybe he believed in the strength of his argument against going into the medical profession: *Homo homine lupus, medicus lupior*. He was a wise man.

Access to the avian embryo was disclosed to me by Prof. J.J. Pasteels. My recollection of his demonstrating how to open incubated chicken eggs and mark the embryos with toluidine blue is still vivid. He decisively influenced the choice of the material I was going to work with. I returned to Gent from the now abandoned *Institut d'Anatomie* of the *Rue aux laines* in the center of the *Quartier des Marolles* in Brussels, in love with chicken embryos, ready to start a lifelong affair.

In 1955 I went for six months to Strasbourg, to learn the technique of organotypic culture in Prof. E. Wolff's Lab. For him, those were the last months before he moved to the Collège de France in Paris, to continue his brilliant career.

What is your main contribution to avian embryology: what did you discover?

My spontaneous answer: not very much. Moreover, I did not systematically multiply the number of my publications. I do not want to contribute to the ink pollution that is going on at an exponential rate, making it difficult to keep up with the original literature. Second-hand literature is probably not the solution: *traduttore traditore*.

I do insist: you made a classic contribution to our knowledge of the origin of the chicken endoderm

I contributed indeed to the breakthrough idea that the definitive endoderm originates from the upper layer. In my paper of 1962 I proposed the division of avian gastrulation into more stages than described by Hamburger and Hamilton, but my classification has not been used very much. Most authors prefer to add plus and minus signs to the Hamburger-Hamilton stages.

A little later, in 1965, I described how the inductions obtained with grafts of Hensen's nodes are different from nodes from St 4V or from St 7V blastoderms. The young nodes evoke forebrain, the older ones hindbrain and spinal cord.

In 1970 I published a study on the development of the chicken blastoderm with cinemicrographic observations. Recently some microvideographic observations of a collaborator have been chosen to make part of an educational video-film (Bortier, 1991).

You were also using xenografts for experimental induction research

I observed the induction of secondary primitive streaks evoked through grafting fragments of the posterior part of the primitive streak into the proamniotic cavity. The cells of different origin were recognized by the use of chick-quail xenografts after N. Le Douarin. This was described in a paper published in 1984. Later on we studied the evolution of the laminin layer during normal development and during experimentally evoked gastrulation (Bortier *et al.*, 1989).

Prof. Vakaet, you also had a deep influence on the scientific life of our country as a teacher with heavy duties. Do you like teaching?

At the start of my career, I persuaded my mother and my wife that one step forward in biological knowledge might eventually do more good to mankind than a lifetime of medical practice. They have been generous. Aware of the improbability that I would make that step, I have earned through lecturing the right to do embryological research. From 1965 to 1991 I lectured a full 200 hours per year on Anatomy and Embryology. By doing so I have also tried to compensate the investments of the Universities and the National Fund for Medical Scientific Research.

As for the last part of your question: now I know that I did like teaching.

You were at Gent and Antwerp universities?

Yes, but successively. As a full-time professor, I started in Antwerp in 1965, at the Rijksuniversitair Centrum, of which I was one of the «founding fathers». I started a Laboratory of Embryology to study avian development. In 1983 I came back to my *Alma mater* in Gent where I had to build up again a Laboratory of avian embryology. This has been possible thanks to the generosity of the above-mentioned authorities.

I understand that you retired recently. What are your hopes and prospects for the future?

My hobbies were and are my research and my family: they are also my hope. Upon retirement, I had to leave my Lab: teaching did not help. Fortunately I have found a haven in the Lab of my first student, professor M. Mareel. More than thirty years ago, I infected him with the virus of scientific research: this probably merely confirmed his disposition. In his Lab I can go on seeing my students and help them with their research. Hopefully this will also allow me to realize together with them the videographic cartoon of avian development that should become the synthesis of all the facts that I have collected on shape and movement within the avian embryo.

I hope that I will have more time for my family: my wife for almost forty years, my three children and especially my two grandsons. They carry for me what is left of my illusions.

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