

CLIMATE  
AND ENVIRONMENT

CAN EUROPE RISE TO  
THE CHALLENGE?



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The *Collège de France Newsletter* is but one of the means through which the Collège de France disseminates teaching and research throughout the world. It is also available on [www.college-de-france.fr](http://www.college-de-france.fr). Most articles included in this issue were first published in nos. 38 and 39 (Academic year 2013/2014). ■

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In my last editorial as Administrator,  
I would like to reflect on the Collège de France  
in the twenty-first century, on its projects,  
and on the challenges it is facing today.

Our institution is comprised of concentric circles. The outer circle is its audience. It is for them, for all those seeking to cultivate their minds outside the traditional University framework, that the institution was founded nearly five centuries ago. Today this audience is welcomed at the heart of the Latin Quarter, in an entirely renovated architectural space elegantly combining tradition and modernity. Here, specialists learn the latest developments in their field. Lay persons, even when they perhaps do not understand all the intricacies of what they are taught, bathe in the atmosphere of the place, witness the ways in which research is progressing, and share the exciting feeling of participating in the on-going advancement of knowledge. Others, in even larger numbers, who work during the day or live far from Paris, cannot attend the lectures on site but can join in this adventure via the Collège de France website, where most of the teaching is published.

As a professor and Administrator, I have sensed this audience's enthusiasm. I have been in direct contact with those who have attended my lectures and those who have filled the lecture halls for Inaugural Lectures, Autumn Symposia, and other seminars. When delivering lectures away from Paris, I have also found that the attachment to the values defended and disseminated by the Collège de France are present throughout the world. In all the audiences that I have met, curiosity for science, passion for culture, and thirst for understanding the world and sharing the research undertaking are really the underlying justification for our institution's *raison d'être*. ►

► The Collège de France's second circle consists of its administrative and technical staff. These are the people who keep the Institution alive, day-to-day and over time. They see to welcoming audiences and to the logistics of the events that punctuate life at the Collège. Additionally – unknown to the public – they ensure the functioning of the Chairs, the research teams, the libraries and the website. They also manage the institution's finances and its buildings. Finally, they deal with the Collège de France's administrative relations with the State, and its ties with the universities and major research institutions with which we are partnered. Over the last three years, I have witnessed this staff's profound attachment to the Collège, and its adhesion to the institution's spirit and values. Its interest in the life of the Chairs and its presence at the many Inaugural Lectures and seminars play a key part in maintaining the institution's cohesion. Beyond the succession of Chairs, due to professors' retirement or arrival, the permanent staff contributes to perpetuating the Collège de France's spirit. It does not participate directly in its scientific life, yet it transmits its values. Without this cohesion and memory, I would not have been able to manage our institution nor represent it convincingly.

The Collège de France's third circle is its researchers and academics who work in the Chairs' teams and in those of their partners. PhD students, post-doctoral fellows and senior researchers carry out in the laboratories and the libraries much of the research that professors teach in their lectures. This gives us some idea of the crucial role that they play in the Collège's life and that enables it to fulfil its mission of disseminating science and culture. Research is largely a matter of knowledge transmission and dialogue between generations. The Collège de France professors, appointed once they have reached a high degree of renown and recognition, have to select younger colleagues to work with them, whom they train. For a long time, due to a lack of space or adequate laboratories, the majority of these teams were based in other institutions. With the completion of extensive renovations of our buildings, an increasing number of these researchers are now housed on our premises, Place Marcellin-Berthelot, Rue d'Ulm

and Rue du Cardinal-Lemoine. The renovations currently in preparation on the latter site will harmoniously complete this concentration of research teams in the institution's own buildings. Having researchers from diverse disciplines in the sciences and humanities working together like this on the same sites is a great asset for our institution.

This brings me to the last circle, that of the professors. They are the core of the Collège de France, founded in the sixteenth century around a few Lecteurs Royaux (Royal Lecturers) who were tasked with teaching everyone subjects that were not recognized or that were neglected by the university. Tradition, as well as the statutes and rules that have perpetuated it, give the professors the collegial power to co-opt one another and to manage the institution. All decisions are made by the Faculty, which meets three times a year. This tradition, whereby a concentration of powers based on academic criteria alone was instituted, is exceptional in the academic world in France and even worldwide. It has enabled the Collège to survive throughout the centuries and political regimes while maintaining its high level of excellence. Like all human organizations, this system is fragile and its success depends on a subtle alchemy. The choice of themes for the creation of Chairs, along with the quality of the professors recruited, are essential to ensure the institution's excellence. The body of professors, which is limited to about fifty individuals, has to be sufficiently diverse for a wide spectrum of disciplines to be represented, so as to encompass all developments in science and culture. There also has to be an atmosphere of trust among the professors of the various disciplines, so that specialists in one field can convince their colleagues in the other fields of the quality of the candidates they propose. Finally, the professors have to remain in close contact with the academic community outside the Collège, both in France and abroad. They have to draw on their colleagues' advice and to ask for and take into account their opinions, before creating a Chair or electing a new colleague. To grasp the crucial importance of these decisions, requiring much reflection and consultation, one must realize that the Collège de France creates on average five

Chairs per year, which corresponds to a renewal rate of ten per cent of its professors. During my years at the Collège de France, these discussions have afforded me the privilege of rubbing shoulders with colleagues with exceptional personalities. Friendships have formed between us, depending on our affinities, our intellectual interests, and the convergence – sometimes even the divergence – of our ideas and worldviews.

I will conclude this reflection with some thoughts on the Collège de France's projects and the challenges it has to meet in the coming years. With our renovated laboratories and the Institute of Civilizations, our ambition is to give new impetus to research and the dissemination of knowledge in these culturally and historically rich buildings in the heart of Paris. We are thus perpetuating the Collège de France's tradition, by adapting it to the changing conditions of our national and international environment. While maintaining our academic independence, we foster strong ties with the universities and institutional groupings that form the new academic fabric of this country, especially the Fondation Paris Sciences et Lettres (PSL). To keep up our rank in competition with the most prestigious institutions abroad, we encourage our researchers to seek more European and international funding for their projects. We also foster exchanges between professors and visitors with many universities and research centres around the world. As we are concerned about the geopolitical and climatic challenges facing our planet, we put the competencies of our professors in the exact sciences and the social sciences and humanities at the service of the reflection needed to understand the problems involved and to strive to solve them.

All these activities require more means, at a time when state funding has been capped and in some cases cut. The Collège de France is not the only institution devoted to research and culture to suffer from the current economic context. In France, in the rest of Europe and throughout the world, the prevalence of the law of the market tends inexorably to reduce all investments that are not immediately profitable. Activities that are essential for human fulfilment, those that seek to satisfy scientific curiosity or its aesthetic aspirations, are receiving less and

less public funding as such, and have to justify their potential utility. This demand conflicts with the very nature of fundamental research, the results of which are by nature not programmable, and which lead to applications only many years after initial discoveries. In this context, the Collège de France has no choice but to diversify its sources of funding and increasingly to appeal to those in civil society – from modest donors to large patrons – who share its values and have the means to contribute to the promotion of scientific and cultural research. The Fondation du Collège de France, created in 2008 to centralize and organize donations, recently launched a major campaign to seek funding by raising public awareness of our institution's growing needs. I hope that this campaign will be fruitful and will help the Collège to develop its ambitious projects in the coming years, after crossing the difficult period of economic crisis that we are currently experiencing.

Finally, my hope is that, beyond the current contingencies compelling it to apply a strict budgetary logic dictated by the law of the market, The French State will fully resume its sovereign function as the defender and advocate of science and culture, with a long-term vision. This will require substantial increases in the public funding allocated to them, based on multiannual planning and without interruptions. It is important for the Collège de France, and essential for the future of French research as a whole, as it will guarantee its attractiveness to young scientists as well as its reputation worldwide. ■

**Prof. Serge HAROCHE**

**Prof. Serge HAROCHE**  
Quantum Physics (2001-2015),  
Collège de France Administrator  
(2012-2015)



Prof. Sanjay  
Subrahmanyam

# At the Origins of Global History

**The circulation of texts and material during the sixteenth and seventeenth centuries produced a conjuncture that opened a range of possibilities for historical production.**

In a recent book, entitled *Clio and the Crown*, the American historian Richard Kagan provides an overview of medieval and early modern Spain, ranging from simple chorographs to Antonio de Herrera y Tordesillas's all-encompassing imperial chronicle. As regards Elizabethan England, there is a sharp contrast between Raphael Holinshed's eminently national history, and the global view of Richard Hakluyt or even Sir Walter Raleigh's *History of the World*, a text that was still incomplete when the author was put to death in 1618. For a final example, let us return to a context that is very familiar to me, that of the late sixteenth- and seventeenth-century Mughal Empire. There are a number of historiographic possibilities available to us. First, there is the *Akbar Nâma*, a great text written by Shaikh Abu'l Fazl, which starts with the creation of the world and is then largely limited to the classical dynastic history of the Timurid sultans in India. Second, we find the chronicle of Muhammad Qasim Firishta, which was produced outside the Mughal Empire but drew on both Mughal and earlier texts to produce a regional history of the Indian sub-continent under Muslim domination. The third is a highly personal and secret text by Maulana 'Abdul Qadir Badayuni, in which a sceptical view of the mystical and political claims of the Mughal sovereigns is evident. Finally, there is the *Târikh-i Alft*, a millennial chronicle of Islam written by several authors. We can easily add to these four texts ten others, which were sometimes written from the point of view of the Afghans vanquished by the Mughals, and which sometimes expressed the grievances of the Central Asian elite who were disappointed by the unstable behaviour of their Mughal masters.

As you know, global history is at the centre of a number of controversies, in this country and abroad. It is sometimes thought of as nothing more than a desire by American academics to destroy the good old tradition of national history and to replace it with an imperial and imperialist perspective. English-speaking authors have often imagined that the subject was invented in the first half of the twentieth century by authors such as Arnold Toynbee and Oswald Spengler, and then generalized by the following generation. Other historians of ideas have more ambitiously dated the current back to the late eighteenth century, drawing on cases such as that of August Ludwig

Schlözer, known for his contributions to *Weltgeschichte*. This type of history was considered in this sense as a product of the German and Scandinavian *Aufklärers* and of their exceptional openness to the world. It is therefore no coincidence that the rise in the past three decades of postcolonial movements – which are often fiercely hostile to the Enlightenment and its intellectual heritage, and which confuse Schlözer's and Hegel's ideas – has created tension around the status of global history.

What I have sought to show here is a part of the long and slow evolution of global history as a minority trend, or *Oppositionswissenschaft*, or more modestly as a kind of Bièvre River in contrast with the more visible Seine of national and imperial history. Research and teaching on the global history of early modernity are actually not unprecedented, neither in France nor even at the Collège de France, even though the subject has not always been formally identified as such. As I have endeavoured to explain, the field has a fairly complex and varied genealogy, but to my mind it is important, from the outset, to rule out the idea of a field where synthesis, rather than first-hand research on archives and texts, prevails. This means that it is impossible to write a global history from nowhere or – as some have proposed – by adopting an “extraterrestrial” perspective. Like any historian, I remain attached to particular places and spaces, and my knowledge is the direct product of training in the reading of texts, archives, and images. It turns out that in today's world there is growing interest and curiosity in this type of history, although I am firmly convinced that it is destined not so much to replace the history produced on a regional, national or continental scale, as to complement it. I am also convinced that new synergies can be found by combining these historical varieties under the same roof. ■

**Excerpts from the Inaugural Lecture 28 November 2013**

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Akbar Hunting Black Buck from the Akbarnama © James Stevenson

- The Inaugural Lecture is published by Éditions Fayard and is available online at [books.openedition.org/cdf/3599](http://books.openedition.org/cdf/3599)
- A video of the Lecture can be found at [www.college-de-france.fr](http://www.college-de-france.fr), on the professor's page.



Prof. Sanjay SUBRAHMANYAM  
Early Modern Global History  
(2013-2014)



The “golden peaches” of Samarkand in the days of Sogdian trade

### As a cultural area Central Asia was recognized at a late stage, since its emergence as a geographical reality was very slow.

The term Central Asia was coined in around 1825, simultaneously in Russia and in France, by the diplomat Georges de Meyendorff and by Julius Klaproth, respectively. It soon gained currency, along with its variant Middle Asia, sometimes preferred in Russia. Reading this nineteenth-century geographic literature, it soon becomes apparent that behind rationalizations about climates and so-called natural borders lay a deep misunderstanding between the European perception and the Russian one. From the European point of view, Central Asia was defined as that which was neither Russia, nor China, nor Persia, nor what was then becoming British India: it was a sort of in-between destined to receive buffer States, the only one ultimately being Afghanistan.

By contrast, from the Russian perspective it had been seen since Peter the Great as a contiguous space, the natural continuation of the Russian-Siberian steppe, which the empire of the tsars had set out to control, then annex, and finally colonize. In its various manifestations, this project was fuelled by strategic necessities, a sense of cultural superiority or a great ideological design, or even the dream, in Pan-Slavic circles, of reconquering the cradle of the Aryan people. The recognized fact that this space did not have limits which could be proven scientifically, conveniently supported several Russian and then Soviet attempts to violate it, be it in Chinese Turkestan on several occasions, in Iranian Khorasan during the last war, or in Afghanistan more recently. My predecessor, Louis Hambis, who worked extensively on Siberia and Mongolia, gave it a very broad meaning. In my teaching, I personally intend to refocus Central Asia within the narrower limits on which archaeologists have agreed for several decades. These encompass the five former Soviet republics of Turkmenistan, Uzbekistan, Tajikistan, Kazakhstan and Kirghizstan, along with Afghanistan and, additionally, an interest in the autonomous Chinese region of Xinjiang, especially during the periods when it shared strong cultural affinities with the countries to the West of the Pamir. I will nevertheless remain open to studying Iran, particularly Sassanian Iran, which was a powerful neighbour, at times a partial conqueror, and a reference in certain domains. I will also not systematically observe the cut-off point between Pre-Islamic and classical Islam.

It is worth considering first how this space was defined in the West before the invention of the term Central Asia, which

## HISTORY AND CULTURES OF PRE-ISLAMIC CENTRAL ASIA

### Prof. Frantz Grenet Re-Centring Central Asia

occurred somewhat by default. What it came to replace on our maps is actually the notion of Tartary, or Great Tartary. This terminological past has had its role to play in the way these people have been perceived in the long term. Tartary was the land of the Tartars, whom Saint Louis said had left Tartarus and should be sent back. In view of many other historical events, the most recent one being 11 September 2001, one might be tempted to think that the people of Central Asia are somewhat like Léon Ferré's anarchists: they are noticed only when they are feared.

The archaeology of Central Asia is very young in comparison with that of other regions. Aside from the great explorations of Chinese Turkestan which, except for Mark Aurel Stein's work, were mostly collections carried out without excavation methods worthy of the name, it mainly dates back to two schools that formed in the pre-war years and which met only during the 1980s. These schools, which have now to a large extent merged in the field, are the French school of Afghan archaeology, and the Soviet school of the Central Asian republics.

One of the purposes of my seminar will be to contribute to what I will call a documentary watch. In Central Asia, probably more so than in many other geographical areas, it is important to know how to accept and deal with the unexpected. If I consider my scientific production over the last fifteen years, at the very least a quarter of my articles were not planned at all. Who could have foreseen, even just a few months earlier, the reopening of Afghanistan to archaeological research in 2002, after being closed for twenty years? Of course, as some fields open, others are at risk of closing without any further notice. But historical interactions between all the countries of Central Asia as well as the necessary methodological to and fro between the field, texts and images offer many fall-back and reorientation possibilities. All researchers working on the area have at some point in their career experienced these constraints, which can ultimately prove more stimulating than settling down too comfortably. ■

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- A video of the Lecture can be found at [www.college-de-france.fr](http://www.college-de-france.fr), on the professor's page.

Prof. Frantz GRENET  
History and Cultures  
of Pre-Islamic Central Asia



# Prof. Pierre-Michel Menger

## Difference, Competition and Disproportion

**This Chair is devoted to the sociology of creative work. Its disciplinary identity places it in the illustrious footsteps not only of sociologists who have taught here, but also of two of them who should have done so. I have in mind Émile Durkheim, whose failure to be elected at the Collège de France negatively marked those times, and Maurice Halbwachs who, shortly after being elected, was arrested and deported in 1944, never to return.**

My teaching will approach work through its creative dimension. Here creative does not only refer to a common theme – the study of creative work, especially in the arts and the sciences –, it also evokes the complements that allow us to define work as socially creative: value, identity, collective protection, status, etc. These complements, along with others, can easily be spread across a continuum between two contrasting ordinary functional definitions of work: its instrumental and its expressive values. According to the former, work is the engagement of individual energy in more or less difficult conditions of physical effort and mental strain. The latter defines work as self-realization through the act of production. The distinction between these two values was shaped by a long philosophical tradition and was taken up by the social critique of the mutilation of work through its specialization and commodification. It only became analytically operational with the multidimensional characterization of all types of work.

The critical effectiveness of the argument according to which complex work is but a multiple of simple labour is well known. Based on this premise, Marx somewhat ambiguously proposed that work be homogenized, and that the economy of value, the remuneration of work and the situation of exploitation in work relationships be made to correspond with one another. As Jon Elster has shown, this correspondence wavers when the full heterogeneity of work is acknowledged. The sociology that I wish to develop here consists of a multidimensional exploration of work.

The research agenda on work has evolved with the transformations of our societies and their economies. The sociology of industrial labour was central to the earliest sociology of work. The employee category, which later became prominent, raised another issue: that of the wide range of occupations and employment conditions in an economy that had come to be dominated

by services. From the 1970s onwards, rising levels of qualification in the workforce and increasing numbers of senior positions generated growing interest not only in the work of managers and the intellectual professions, but also in professions with high levels of expertise, a legal monopoly of practice and market positions that were often at the interface between the private and public spheres – primarily doctors, lawyers and architects.

Professions and employment systems in the arts, to which I have devoted many studies, have been part of the sociological research agenda for about thirty years. In the 1950s, the INSEE (National Institute of Economic Studies) had grouped artists, the clergy, the army, the police and sports professions into a single category, along with a few other unclassifiable professions like mediums and radiesthesists. In the new nomenclature of socio-professional categories, revised under the influence of the most advanced sociological theories and implemented in 1982, the INSEE grouped artists with managers and higher intellectual professions, alongside researchers and teachers. However the first census using this taxonomy revealed singular traits among artists: their economic position was similar to that of intermediary professionals, and they presented widely disparate incomes with a high rate of underemployment and pluriactivity, unparalleled in the higher professional category.

The particularities of these professional worlds can raise the question as to whether creative work is the right side of work, the flipside, or a possible ideal thereof. Answers vary depending on the criteria. Creative and research jobs are highly appealing: they score very well on scales of professional prestige. But they present an equally high risk of failure, underemployment or hybrid practice, in combination with less interesting side jobs. Does the choice of such jobs represent an exceptional case of preference for risk? ■

### Excerpts from the Inaugural Lecture 9 January 2014

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**Prof. Pierre-Michel MENGER**  
The Sociology of Creative Work

# Prof. Alain de Libera

## Where is Medieval Philosophy Going?

**We come to the Middle Ages with questions, only to discover other ones. After more than forty years of teaching and research, I must admit that I have given up most of my predecessors' questions: Christian philosophy, theology of history, and philosophy of religion. On the other hand, another one has imposed itself on me with growing acuteness: how to do history in medieval philosophy?**

The difficulty stems first from the nature of the object, medieval thinking, that is said to be torn between reason and faith, and second, from the status of the discipline itself, the history of philosophy, which is challenged by philosophers and historians alike.

To that I will simply answer today that *one cannot do history of medieval philosophy without doing medieval philosophy*. The Chair that has just been recreated is not a cenotaph. The object exists and only asks to live. When it comes to philosophy, whether or not Deslandes and Le Gendre like it, the Middle Ages are not the longest parentheses in the history of human thought. They are nevertheless long, even longer than we think; and it is also true that, although central, they are relatively remote from everything else. Yet their limits are variable, or rather, dependent on one's view of history as much as philosophy.

When did medieval philosophy begin? When did it end? One might say, is it not self-evident that *it began and ended with the Middle Ages*? That is incorrect. Or rather, it depends on one's answer to other questions. For a long time the historian's Middle Ages started with the fall of Rome in 476, with the abdication of Romulus Augustulus, the last Roman Emperor in the West, and ended in 1453 with the capture of Constantinople by Mehmed II and the fall of the Eastern Roman Empire. This ending of the Middle Ages, a political and religious event internal both to the Roman world and to Christianity, also culturally marked the beginning of a period of revival, the "Renaissance", driven by the exile of Byzantine humanists in Italy. As we can see, there is no purely historical periodization: political history is closely entangled with cultural history, and the latter with literary history, which can weave two narratives with contradictory meanings on the same weft. The same is of course true of the history of philosophy.

Medieval philosophy can lead only to an event *for philosophy*: here, the closing of the Neo-Platonic School of Athens in 529 by the Christian Emperor Justinian, which led to the exile in Persia of the last pagan philosophers, from Damascius and Simplicius to Isidore of Gaza. For whom was the closure of the Athens School an event? For us, *and not for the Eastern Christians*, who for a long time had baptized philosophy, making "philosophy according to Christ" the real philosophy, be it Christian life as such or its perfect form, monastic life. Neither was it an event for the Latins, who for a long time could say with Augustine: "Versus philosophus est amator Dei." Closure, exile, and conversion: that was the first episode. What was the last one? Ernest Renan argues that everything changed when, "on 4 April 1497, Nicholas Leonicus Thomaeus took up the Padova Chair to teach Aristotle in Greek". The creation of a Chair of Philosophy free from the tutelage of the scholastics' Arabized Latin, from their "emaciated categories" and their "untamed jargon": this is what might mark the end of the Middle Ages in philosophy. The thesis is precise, even excessive, but it draws attention to an essential point: the entry of Greek, and at the same time of then oriental Greece, into the European fold.

Between the closing of the Athens School and Leonico Tomeo's accession to the Chair, there is more than *one "Middle Ages"*. There are *several continuations* from Late Antiquity, several changes of language, several phases of discontinuity, rearrangement and reshaping, several renaissances, reversals or interruptions, in all sorts of environments and geographic, cultural, religious, and institutional spaces. The historian of philosophy must simultaneously preserve their particular characteristics and identify their similarities. A sixth-century student of Olympiodorus or of Stephanus of Athens is not a twelfth-century Parisian ecclesiastical scholar, but apart from the diversity of places, environments and idioms, both had a highly significant point in common, they read the same philosophical texts: Aristotle's *Categories* and Porphyry's *Isagoge*. They were actually philosophically closer than are those who today argue "the futility of reading a philosophical article more than ten years old". ■

### Excerpts from the Inaugural Lecture 13 February 2014

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Prof. Alain de LIBERA  
History of Medieval Philosophy



## CHEMISTRY OF MATERIALS AND ENERGY

# Prof. Jean-Marie Tarascon Examples and Future of a Millennial History

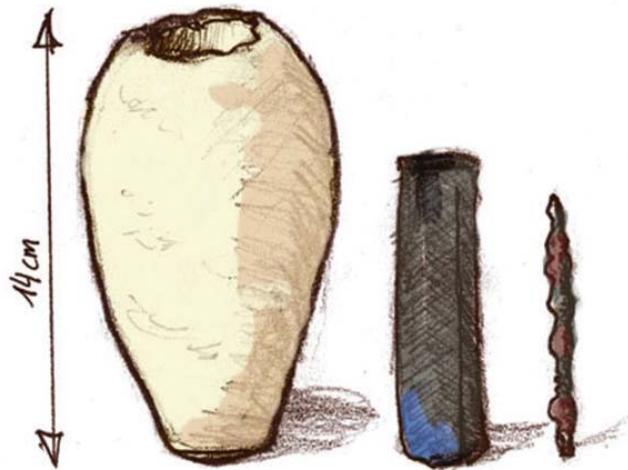
**The development of humanity has always been linked to that of materials. This premise is constantly being confirmed today, since emerging technology is still reliant on chemistry's sometimes capricious ability to supply more efficient materials which are better suited to the additional constraints imposed on them.**

In this context, the “solid-state chemistry – energy” pairing is crucial to meeting the fundamental and applied challenges surrounding energy transition.

For thousands of years solid-state chemistry was used as a series of recipes, similar to those found in culinary art. Over time and following nineteenth-century scientific discoveries, it became a real science of matter and its transformations. Through experiments, chemists were able to reveal the secrets of matter and to understand it better, in order to transform it rationally to create materials with the functionalities relevant to energy.

Judging from the Baghdad battery, the “solid-state chemistry – energy” coupling already existed in Antiquity. Erstwhile potters moreover knew how to turn an ordinary mix of clay and water into beautiful pottery, and foundry-men knew how to obtain metals. Thus, over the centuries, the Stone Age led to the Copper Age, then to the Bronze and the Iron Ages. Note also that the first artificial pigment, Egyptian blue, was synthesized 5,000 years BCE. None of these craftsmen knew the chemical reactions involved in these transformations but they operated with reliable recipes whose science they did not understand.

The shift from know-how to a science governed by scientific laws was not made easier by alchemists, whose overriding intention was to transform metals into gold by combining four elements: fire, air, earth, and water. It took over 2,000 years to shift from these four combined elements to the thirty-three elements proposed in 1789 by Lavoisier – who is considered de facto as the father of modern chemistry. His work triggered an effervescence of all aspects of chemistry, at a time when it would benefit from the great nineteenth-century discoveries (particularly the X-ray by Röntgen and atomic theory, developed by Planck and Schrödinger).



Baghdad battery, sketch of the three pieces © Iromie

All these discoveries contributed to the revival of solid-state chemistry in the early 1950s. This new expansion was also fuelled by the strong interactions that had developed with solid-state physicists and an industrial context highly conducive to the creation of innovative materials. Solid-state chemistry thus became a science, based on the relationship between properties and structures, which could be used to develop new materials with specific functionalities.

Once these foundations were established, solid-state chemists used their main tool, the periodic table, to choose the right elements to control chemical bonding, compose its partition and design new composites, or adjust their physical-chemical properties on demand. Thus, through cationic/anionic substitution, they were able to orient the electronic and ionic conduction properties of materials, their optical properties, their colours, their magnetic properties, and even their energy storage properties, so as to turn them into materials valued highly in industry.

This soft chemistry thus revolutionized our approaches to synthesis, allowing not only for the stabilization of new phases but also for the modification of their morphology, so that they could be used as a third dimension (in addition to temperature and pressure). This, in turn, would allow for the optimal orientation of the performance of the materials obtained. “Optimal”, as this science can sometimes find itself at the crossroads of the foreseen and the unforeseen, which is what makes it appealing to chemists.

Given the limited time we have to address energy issues, the chemist’s intuition and ability to assemble atoms and create composites are no longer sufficient to exploit rapidly the full wealth of the periodic table. Thousands of combinations are possible. Much hope is therefore put in the ability of rational combinatorial theoretical chemistry to imitate, with materials, the processes that occur in the genome. ■

### Excerpts from the Inaugural Lecture 23 January 2014

Source: *La lettre*, no. 38, June 2014

- The Inaugural Lecture to be published by Éditions Fayard and made available online.
- A video of the Lecture can be found at [www.college-de-france.fr](http://www.college-de-france.fr), on the professor’s page.



Prof. Jean-Marie TARASCON  
Chemistry of Materials and Energy

# Prof. Alain Fischer

## Immunity, Genetics and Medicine

**The study and understanding of infectious, autoimmune, and inflammatory diseases, as well as allergies falls largely under immunology.**

The challenge is huge as their determinism varies, combining hereditary and environmental components that are difficult to reconstruct. Genetics has contributed to the recent progress of immunology, particularly to that of human immunology. It has long been observed that vulnerability to infectious agents varies from one individual to the other. During the 1950s, Anthony Allison was the first to demonstrate that a genetic trait could be selected in the human species because it confers a capacity of resistance to an infectious agent. Epidemiology has furthermore demonstrated the weight of heredity in the occurrence of infectious diseases: twenty-five years ago, Thomas Teasdale showed that the risk of premature death caused by infection during adulthood is 5.8 times higher if a biological parent has themselves died prematurely of an infection, whereas we do not observe this risk in the case of an adoptive parent's premature death from infection. What is this risk, and how can it be assessed?

This is where my medical field comes into play: that of rare and hereditary immune system diseases called *primary immune deficiencies* (Pid). A whole series of rare or even exceptional diseases (for example 1 case/1 million births) exists, during which the immune system is altered, variably causing vulnerability to infection, autoimmune or inflammatory diseases, allergies and sometimes cancers. It has been estimated that one in 5,000 individuals are born with this type of condition, of which approximately 250 have been described to date. These conditions are caused – or so it seems – by a single event: the mutation of a gene responsible for the loss or, more rarely, the gain of a function of the corresponding protein. The study of these Pids – like that of many other rare genetic diseases – offers an exceptional observatory of human biology and its anomalies. The value of this approach is threefold: identifying piece by piece the key elements of the immune system necessary to its development, its effector functions and its regulation; in so doing contributing to the understanding of the mechanisms involved in controlling an infection or preventing excessive inflammation, or autoimmune responses; and allowing for a precise diagnosis of these diseases and sometimes the elaboration of a therapy. This approach has proven to be and still is fruitful.

One example relates to self-tolerance, the failure of which causes autoimmune diseases. The T and B lymphocytes reacting against our own antigens are normally non-pathogenic. How are they effectively controlled? The answer to this question stems partly from the study of rare hereditary diseases that are responsible for susceptibility to autoimmunity. Our main contribution, with Frédéric Rieux-Laucat, has consisted in identifying the hereditary anomalies of the gene coding a protein called FAS in patients suffering from an autoimmune lymphoproliferative syndrome. FAS is a membrane receptor which is notably present on the surface of T and B lymphocytes. Its bond by a ligand, the FAS ligand, present on the surface of activated T lymphocytes, causes the death of chronically activated lymphocytes – which is exactly the situation encountered for specific lymphocytes of self-antigens. This molecular communication system, which can act intra- or intercellularly, thus controls the potential escape of autoreactive T and B lymphocytes. It has also been shown that “acquired” somatic mutations of the same gene could encourage the emergence of autoreactive lymphocytes and consequently of certain autoimmune diseases, since such lymphocytes acquire a selective survival advantage. This observation underpins a hypothesis likely to explain common autoimmune diseases: the accumulation of somatic mutations of genes controlling cell death or division within autoreactive T and/or B lymphocytes may facilitate their escape and therefore the induction of autoimmunity, following a model similar to oncogenesis. ■

**Excerpts from the Inaugural Lecture 15 May 2014**  
Source: *La lettre*, no. 39, March 2015



- The Inaugural Lecture is published by Éditions Fayard and is available online at [books.openedition.org/cdf/3701](http://books.openedition.org/cdf/3701)
- A video of the Lecture can be found at [www.college-de-france.fr](http://www.college-de-france.fr), on the professor's page.

Prof. Alain FISCHER  
Experimental Medicine



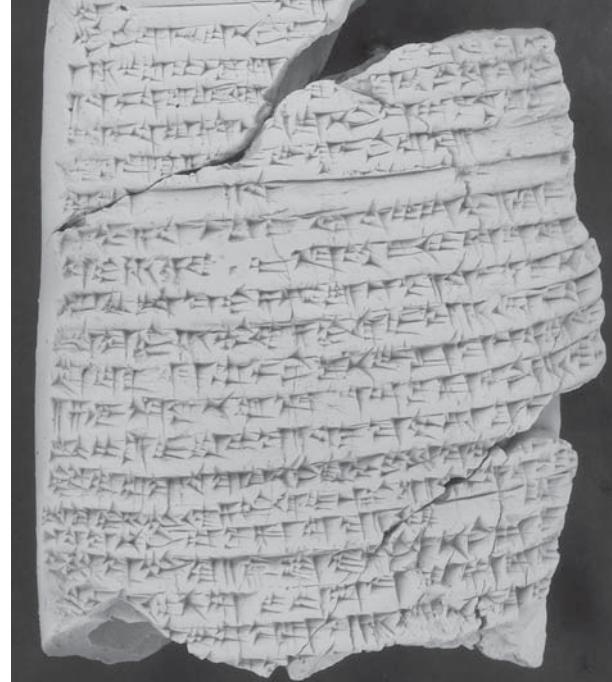
Prof. Dominique Charpin

# How to be an Assyriologist?

On the Assyriologist's  
daily work

**There are many sides to the Assyriologist's work; that is part of its appeal. It unfolds in four complementary places: the field where texts are discovered; the museums and collections where they are kept; the libraries that give access to scientific production; and the research centres where work is carried out, often in collaboration.**

The first stage is the discovery of the texts in the field. Epigraphists must be able to clean and consolidate the tablets themselves, even if the intervention of competent curators is subsequently needed. They must also be photographers. A crucial aspect of their work consists in consolidating fragments. This is done partly materially, through a sort of 3D puzzle, but the fragments can also be linked on the basis of characteristics such as writing, the use of a specific name or expression, etc. This fieldwork has supported my belief that the archaeological context of written documents must absolutely be taken into account. It is true that Assyriologists often work on tablets kept in museum drawers, which come from old excavations, donations or purchases. Unfortunately, in many cases the documents' origin is unknown: one has to try to find it, and match up the tablets with corresponding data. It is therefore important to know a collection's history. Once the Assyriologist has the tablets, he or she works in several stages, with interpretation involved at each of them. How should tablets be edited? There are two schools of thought on this. Some insist on keeping to the tradition of copying the originals by hand. But the benefits of photography are gradually prevailing, now that the cost of their reproduction is no longer a problem. It would however be wrong to believe that a photograph is more "objective" than a manuscript: the crucial issue is lighting. In this respect, the first tests with a 3D scanner have yielded very interesting results. The actual deciphering of the original, often damaged on the surface, is not neutral; it is necessarily relative to the reader's knowledge. Hence the importance of collations: very often, as the edition of a corpus progresses, it is necessary to review the originals that are already published, and to improve their reading. Once the signs have been read, there is the issue of their transcription: the same sign can have one or several phonetic values, but it can also be an ideogram. Unfortunately, most of our texts are broken. How far should we fill these gaps in our publications?



A letter from the Mari archives reconstituted from several fragments.

Some have severely criticized "bold restorations". I would say that one must first be able to propose them, which involves being completely immersed in one's corpus. This is one of the points where computer databases will allow us to work more and more securely, by giving the frequency of co-occurrences: in a given corpus, a specific word is preferably used with a specific other word, etc. Philologists sometimes consider that translation is enough to give the meaning of a text; this is incorrect. But it is also illusive to believe that once the tasks of the epigraphist and the philologist have been completed, the historian's interpretation work can begin. In fact, the editing stage is not and cannot be neutral, for interpretation has *already* begun. In the current state of Assyriology, the idea that editing in the strict sense of the word is more permanent than the commentary is often illusory. To this work we must add what can be called the decoding of the texts. This is true not only when we deal with genres as specific as a hymn, an epic or a commemorative inscription, but also with those that are seemingly closer to ours, like correspondence. There lies the real danger linked to the apparent familiarity conveyed by reading letters. There is probably no greater illusion: the trap of ethnocentrism.

Despite what famous titles can lead us to believe, we will never be able to resuscitate Babylon. What Assyriologists can offer is increasingly rich perspectives on Mesopotamian civilization, which is constantly changing, given both the proliferation of available material and the areas of interest of modern scholars. Revisiting known texts and editing new documents should not be opposed: the two activities are mutually enriching. ■

**Excerpts from the Inaugural Lecture 2 October 2014**

*Source: La lettre, no. 39, March 2015*

- The Inaugural Lecture is published by Éditions Fayard and will be available online.
- A video of the Lecture can be found at [www.college-de-france.fr](http://www.college-de-france.fr), on the professor's page.



Prof. Dominique CHARPIN  
Mesopotamian Civilization

# Jean-Louis Cohen Architecture, Modernity and Modernization

**The way architecture relates to knowledge, literature and the city is central to this first lecture at the Collège de France. Over the last two centuries it has both erected palaces – and factories – for research, and borrowed models and metaphors from science.**

Yet has science welcomed architecture as an intellectual discipline, a field of research as such? Nothing could be less certain. Since 1970, genuine scientific research has been devoted to architecture, and this has contributed to its intellectual “reconstruction” in a sense, in France. Architects were by no means the only protagonists of this collective endeavour, and their work has met with that of art historians, sociologists, geographers, and urban planners, as it has been carried out in their own disciplinary or institutional fields.

Today, challenging the history of modernity in architecture entails more than simply recording new elements of its lexicon – or, to use a linguistic model, distinguishing along syntactic lines the new modes of composition and aggregation of the forms imagined since the appearance of the “modern movement”. In the architectural field, the phenomenon of modernity proves more complex than in art or literature. The forms and spaces that make it visible are attuned to the programmes set out by the more encompassing system constituted by modernization, production, consumption, territories, and, more broadly, society – a system that has been informed by the successive hegemonies of England, Germany, and America since the nineteenth century.

Many architects have also nurtured a strong relationship with literature, proving to be readers as much as builders. Twice fifty years apart, the young Le Corbusier devoured Nietzsche's *Zarathustra*, which was actually also bedside reading for many architects of his generation throughout Europe. But architects were not content with just being writers' and philosophers' readers; they also engaged with them, as they sometimes did with artists, and paid tribute to them. Conversely, many writers shared an interest in architecture. They reflected on its principles and relationships with the other arts and society. Examples are Paul Valéry, from 1891, and Georges Bataille, who denounced the oppressiveness of architecture. Bataille's emotive denunciation was based on an implicit

reduction of architecture to great buildings alone, in which power is concentrated. Yet it was in the twentieth century that architecture stopped addressing the aristocracy and bourgeoisie exclusively, thus making room for programmes tailored for the working classes.

The relationship of the architectural object to urban space and to landscape has been the centre of attention for the last fifty years. It is not just a matter of the material attunement of the building, the monument or the house to the city, or of integrating a product catering to a private commission or to a public programme within a more complex whole, determined by political and economic considerations. The objective parameters of density, height, axiality and topography gave rise to subjective artistic interpretations, articulating myths and representations, and leaving room for invention.

In order to describe architecture's cycles of transformation, and rather than considering it as impermeable, the lectures will fully embed it in history, examining long-term historical continuities, as well as crises and shifts. This history will be approached through multiple material, including oral, archive and written sources, with buildings as primary documents enlightened by the discourses that generated and supported them. Sorting and interpreting buildings will require a constant change of focus. In echo to Siegfried Kracauer's understanding of history, the interpretation of architecture calls for a continuous navigation between the view at urban scale, framed panoramically, that reflects social or technical policies, and the close-up view of buildings and their interior, that reflects their authors' and inhabitants' ideals and engagement. ■

## Excerpts from the Inaugural Lecture 21 May 2014

Source: *La lettre*, no. 39, March 2015

- A video of the Lecture can be found at [www.college-de-france.fr](http://www.college-de-france.fr), on the professor's page.
- Jean-Louis Cohen also organized a symposium on the same theme (see pp. 62-63).

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The D4500 Dmanisi skull (Georgia) ►  
is one of the oldest pieces of evidence  
of the colonization of Eurasia  
by humans 1.8 million years ago.

## Jean-Jacques Hublin Biology of Culture

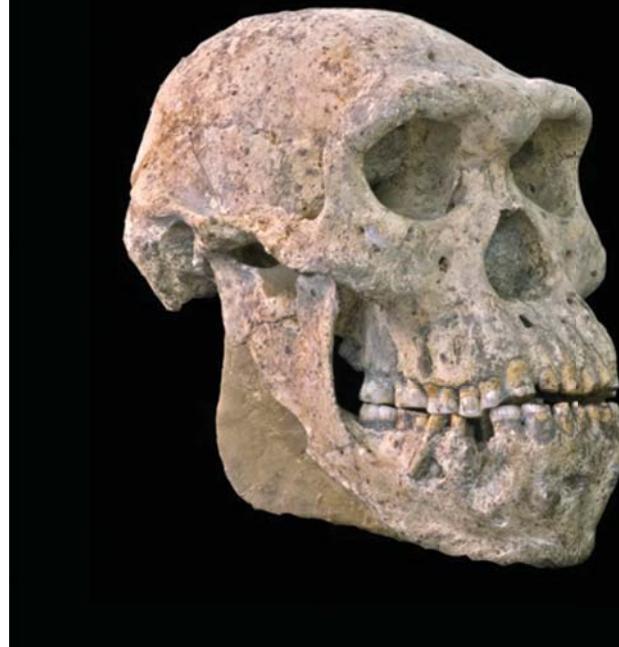
***Homo sapiens* is not the product of a linear evolution. It emerged from a thicket of species, the branches of which have overlapped over time and sometimes over space.**

Africa long remained central to the evolution and demographics of Hominins. Humans colonized Eurasia only over the last two million years, and finally a species, also originally from Africa, replaced all others and occupied all land areas. It spectacularly modified its environment and extended its hold over the genome of other living forms.

Human evolution is all the more remarkable in that it results from a bio-cultural process. Like other mammals before them, our most distant ancestors first adapted to new conditions through biological changes affecting their size, their anatomy, their diet, their locomotion, and their mode of reproduction. However, humans' development of technical behaviours and ever more complex modes of social organization opened a new chapter in the history of life. In the ecological sense of the term, it is a "niche construction", that is, a species' modification of its environment to create conditions favourable to its survival and development. Throughout human evolution, vital biological functions have been externalized. That externalization from the biological to the technical and ultimately to the social has enabled humans to adapt to all environments, flexibly but above all reversibly.

Our brain, which grew strikingly within the genus Homo, played a crucial role in this process. To feed this energy-intensive organ, Homininae profoundly modified their biology, and particularly reoriented their diet towards the consumption of meat and fat. This evolution went hand in hand with an externalization in the technical sphere, following the appearance of stone tools over 2.5 million years BCE. The reduction of the human masticatory system thus began and with it the metabolic cost of its growth. The calories saved in digestion were also reinvested in the development of increasingly large brains.

A second externalization took place towards the social sphere. The energetic and anatomical challenges raised by the



development of a large brain were resolved by the limitation of its size at birth and the prolongation of its growth time. This very late maturation plays a decisive role in the development of our cognitive complexity. At the same time, the development of early weaning has allowed for adults other than the mother to contribute an increasingly large percentage to young humans' diets. This "bio-cultural reproduction", which is founded on complex social and emotional ties, has profoundly influenced the emergence of specifically human psychological traits.

At what point in the past did these adaptations appear? Regarding growth rhythms, it was possible to address this question seriously only with the emergence of studies on dental microstructures. The speed of development was much faster in the Australopithecine than in contemporary humans, and was similar to that of African apes. In *Homo erectus*, the adult brain size was reached faster than in modern humans and the long learning period that characterizes our species was still far from being in place. Finally, in Neanderthals, though much closer to us, cerebral differences from modern humans still arose from the first year of life and sexual maturity probably continued to be reached earlier than in recent populations. It was therefore only during recent phases of human evolution that a modern mode of development was reached. While it has allowed our cognitive complexity to fully form, it was only made possible by the sophisticated technical and social environment that humans were able to create. ■

### Excerpts from the Inaugural Lecture 8 October 2014

Source: *La lettre*, no. 39, March 2015

► • A video of the Lecture can be found at [www.college-de-france.fr](http://www.college-de-france.fr), on the professor's page.



**Jean-Jacques HUBLIN**  
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Institute for Evolutionary  
Anthropology, Leipzig.

Gilles Bœuf

# Biodiversity, from the Ocean to the City

## **How to obtain an objective estimate of species diversity and biodiversity is one of today's crucial questions.**

This is no simple challenge, as everything is evolving very rapidly and the mass destruction of habitats is constantly leading to the disappearance of an unknown number of species. Equally alarming is the disappearance of human descriptors of diversity: systematists and taxonomists. Major scientific organizations' current evaluations do not support the task of describing newly discovered species. Entire groups no longer have specialists in France, nor even in Europe or anywhere in the world.

While "amateurs" can play (and have always played) a leading role for the major species, a significant share of the description of biodiversity will always be the prerogative of researchers and teachers working in research institutions and organizations – either because access to living materials is difficult (hydrothermal sources, deep waters, tropical forest canopy, etc.), or because these amateurs lack interest in "small and very difficult things" or "ugly" things. Today's major research organizations, universities and especially museums must facilitate again the work of scientists devoted to these activities and that of specialists working on less easily identifiable groups. But amateurs also possess immense biological knowledge on the distribution of species, their biology and their ethology. The revival of the "participatory sciences" is well on its way, and over half of the new descriptions of species are by amateurs.

In the mid-eighteenth century Karl Von Linné, the father of "binomial" systematics (Latin name in two words: gender and species), counted approximately 12,000 living plant and animal species. There are currently just over 2 million species recorded, described and deposited in museums. And we are fully aware that we are still far off the mark. Every year, between 16,000 and 18,000 new species are described (still 800 of which are in Europe and 10% in the marine environment): who knows the actual number of currently existing species? How long will it still take to describe everything? And will we have the time? We estimate that between 1.5 and 2% of all species that have populated the planet since its early beginnings are alive today.

Knowledge on living groups varies widely. The major species were described first, together with species from "interesting"

taxons, for various reasons. It is clear that, although we are probably getting there for mammals, for example (there are still bats, small rodents and insectivores to discover), there is still a considerable and most likely unsuspected number of unknown species among nematodes, molluscs, arachnids, crustaceans, and insects. And while the situation is not too bad for "higher plants", including trees, what about fungi, micro algae, protists, bacteria, and viruses? In fact, since the latter evolve extremely rapidly, we can legitimately ask ourselves whether human activities are not actually causing an increase in their number of species. All of this brings us back to the crucial question of the notion of "species".

How can this wealth be estimated in terms of species? It is essential to do so if we wish to obtain reliable measurements of extinction rates. Ideally species would be counted one by one, for each known biotope, but this is of course unfeasible in the vast majority of cases. And most importantly, how can we get from a list of species to an estimate of biodiversity? Every effort must be made and it is especially by comparing results and their coherence that we will be able to assess the relevance of very different approaches.

Biodiversity is not synonymous with a wealth of species. Of course, the former depends on the latter, but it also includes genetic, phylogenetic, morphological, physiological, biochemical, endocrine, ethological and ecological forms of diversity, and all possible combinations. Biodiversity is far more than a catalogue or an inventory of species; it is much rather the entirety of the relations which living beings have established between themselves and with their environment. It is in fact the living fraction of nature. ■

## **Excerpts from the Inaugural Lecture 19 December 2013**

*Source: La lettre, no. 38, June 2014*



The coral ecosystem, a biodiversity "hot spot" for oceans, here the great southern reef in New Caledonia © Gilles Bœuf

- The Inaugural Lecture is published by Éditions Fayard and is available at [books.openedition.org/cdf/3607](http://books.openedition.org/cdf/3607)
- The Chair is funded by TOTAL.



# Philippe Walter

## On the Artist's Palette

### Chemical physics in artistic creativity

**Chemistry and the history of art are two disciplines that few people would naturally associate.**

**A new perspective on the subject is now possible, by emphasizing the material dimension of artistic creativity.**

I would like to show how technological innovation has led artists to invent new ways of painting and, conversely, how the current or future construction of scientific instruments profoundly changes our studying capacity and, for the last few years, has made highly innovative interdisciplinary research possible.

From Antiquity to the last quarter of the nineteenth century, both in practice and in theory, the artistic projects imagined by painters were dominated by the concepts of the imitation of nature, or *mimesis*, and of sensitive expression of reality. The myth of Pygmalion and Galatea, told by Ovid in his *Metamorphoses* and depicted by many eighteenth- and nineteenth-century painters, transcends this desire for perfection and imitation of the world, which makes the artist dream of seeing his work come to life. Two paintings by Pre-Raphaelite British painter Edward Burne-Jones show how the sculptor, enamoured with the image he created in marble, sees his wish to marry such a woman granted with the arrival of Aphrodite, who brings to life the figure he shaped. In terms of pictorial representation, the rendering of the marmoreal aspect and of the delicate feminine incarnate creates a remarkably subtle chromatic transition. Through divine action, adding "a drop of life", the statue comes to life by becoming polychromic, thanks to the fine use of vermilion pigments for the skin tones and the hair and eyes' delicate colouring. Burne-Jones was thus able to recreate the shine of the marble, the softness of the skin and the silk weft of the fabrics through optical effects linked to the colours of the objects, the tonal relationships between shadows and light, and the more or less glossy or matte nature of the reflections.

Over the following centuries, debate on drawing, shades, light and texture continued and painters worked using flat tints, glazes, and colour superimpositions and juxtapositions. The nature of the pigments and the composition of the paints, which were specially developed to retain the light more or less through



Edward Burne-Jones, Pygmalion and Galatea III:  
The Godhead Fires, 1878, oil on canvas, Birmingham Museum  
and Art Gallery, © Birmingham, United Kingdom

layers, and to leave the trace of the paintbrush, played a major role in these trends. Chemical analyses inform us about Nicolas Poussin's approach when he understood that there is an important distinction between a pigment and its appearance in different natural contexts, through diverse optical interactions and the conditions of observation. Around 1620, Matteo Zuccolini, a painter and colour theorist, wrote several books on shadows and perspectives that profoundly influenced Poussin. Analyses of the coat on Poussin's painting *Eliezer and Rebecca*, kept at the Fitzwilliam Museum in Cambridge, has served to demonstrate that the artist chose different yellow pigments for the light and dark creases of Eliezer's garment, in other words either an antimony and lead yellow, or an iron oxide-rich ochre. Shadow is no longer created by adding a dark pigment on a uniformly applied colour; it is present in the artist's mind and is prepared on his or her palette.

Not all artists had the interdisciplinary approach of the great theorists of colour and pictorial practices. Ways of painting often evolved thanks to the links that developed between the arts and society's other fundamental activities, particularly technical and scientific activities. The adaptation and then efficient insertion of a technique, chemical product or tool materialized in artistic practices through transmission that could be either theoretical or entirely experimental. Thanks to these innovations, artists were able to produce works of art that explored nature in a new way. ■

#### Excerpts from the Inaugural Lecture 20 March 2014

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- The Inaugural Lecture is published by Éditions Fayard and is available at [books.openedition.org/cdf/3706](http://books.openedition.org/cdf/3706)
- A video of the Lecture is available at [www.college-de-france.fr](http://www.college-de-france.fr), on the professor's page.
- Philippe Walter also organized a symposium on the same subject (see p. 66).
- The Chair is funded by the Bettencourt Schueller Foundation.



**Philippe WALTER**  
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François Bourguignon

# Poverty and Development in a Globalized World:

## Does development aid help development?

**Since decolonization, international cooperation has been considered as a major instrument for a community which, for humanitarian or geopolitical reasons, has been anxious not to leave a large part of the global population utterly destitute.**

In the current state of knowledge on the effectiveness of aid, however, donors are faced with a dilemma. As potential beneficiaries differ with respect to their needs and their effectiveness in actually ensuring that the aid they receive reaches the most destitute, donors must choose between countries with better governance but less acute poverty than elsewhere, and poorer countries where governance is often weaker. Of course, there would be no need for this trade-off if donors could exert control over the use of aid. In practice, however, this control is limited, bar exceptional cases such as economic or humanitarian crises. This selectiveness of granting aid according to the characteristics of beneficiary countries is very directly observable and has significant consequences.

The International Development Association (IDA), the arm of the World Bank which manages the appeal funds entrusted to it by donor countries, allocates its resources to low-income countries based on a three-term mathematical formula: an index describing the quality of the country's institutions and policies, its per capita income, and its population. The first factor, which sums up expectations regarding the quality of a country's governance, is however given excessive importance.

As national development aid agencies in rich countries tend to follow the same strategy, the last few years have witnessed the emergence not only of "favourites" but also "orphans" of aid, depending on how satisfactory a country's governance is considered to be. Moreover, regarding the use of aid, a clear trend has developed, whereby so-called "social" sectors – health, education and social benefits – are favoured at the expense of infrastructure and civil engineering, where embezzlement is said to be easier.

This aid allocation strategy is counter-productive. As countries that benefit from better governance often grow faster than others, aid is geared towards populations with greater prospects

of improved living conditions. It thus neglects poor populations, which are inadequately governed by unscrupulous elites and whose suffering from poverty is therefore likely to increase. These countries, which the donor community calls "fragile", are thus more or less left behind, and it would be illusory to think that this sanction affects only the ruling classes.

More direct control in these "fragile" countries is perhaps the only way to improve the effectiveness of development aid. After all, that is what China does when it delivers part of its African development aid in the form of turnkey infrastructure built by Chinese companies, thereby short-circuiting the countries' government and local companies. This practice is actually currently banned for Western donors within the OECD Development Assistance Committee. Additionally, taking away ruling elites' sense of responsibility does not seem to be the best way to encourage them to manage their economies efficiently and transparently.

The debate on international cooperation in the development field seems to focus on the question of aid. But analysis shows that the external constraints exerted on the poorest countries cannot all be lifted solely with aid. Be it through trade, migration, the environment, or knowledge transfer, the policies of rich countries and increasingly of emerging countries are likely not only to accelerate but also, in some cases, to curb the least developed countries' growth. Several advanced countries, which are particularly attentive to development issues, are currently seeking to introduce explicit coherence in all their policies. This may directly or indirectly affect the developing world. ■

### Excerpts from the Inaugural Lecture 3 April 2014

Source: *La lettre*, no. 39, March 2015

- The Inaugural Lecture to be published by Éditions Fayard and made available online.
- A video of the Lecture is available at [www.college-de-france.fr](http://www.college-de-france.fr), on the professor's page.

François BOURGUIGNON

Professor, former Director  
of the Paris School of Economics,  
and former Chief Economist  
of the World Bank.



## INFORMATICS AND COMPUTATIONAL SCIENCES

# Nicholas Ayache From Medical Imaging to the Digital Patient

In his 2008 Inaugural Lecture, Gérard Berry explained *How and Why the World is Turning Digital*. Then already, he spoke of the growing impact of informatics on medicine, particularly through the most recent developments in imaging.

It is an immense honour for me today to be invited to this prestigious place, to the Chair of Informatics and Computational Sciences, to present some of the most advanced research in computational medical imaging. This young research field, at the interface between informatics and medicine, designs software which analyses and simulates medical images that can be used to build a digital model of the patient to support diagnosis, prognosis, and therapeutic practice.

Let us start by going back a few centuries in time to attend another lecture that Rembrandt immortalized in his 1632 painting, *The Anatomy Lesson of Dr Nicolaes Tulp*. This painting teaches us a core principle of medical imaging: it is not enough to observe the inside of the human body so as to understand its organization and functioning. It is also necessary to project abstract – geometric and biophysical – models to understand the images of the human body and to move from a description of its structures, anatomy, to an analysis of its functions, physiology. Imaging of the human body has evolved significantly since 1632. Medical imaging is omnipresent in routine and hospital clinical practice. The nature, quantity and resolution of medical images are continuously growing, owing to constant progress in image acquisition technology. In addition to X-ray radiographies, four main imaging modalities are currently used in hospitals: CT scanners (computed tomography), MRI (magnetic resonance imaging), ultrasound imaging, and PET or SPECT scintigraphies (nuclear medicine). The images produced by these four modalities are volumetric: for each point in the human body they provide information measured in a small volume element called *voxel* (*volume element*), the volume extension of the *pixel* (*picture element*). Medical images contain a lot of information. The anatomical image of an organ, or of the entire body, can contain several hundred million *voxels*, stored in vast tables of numbers.



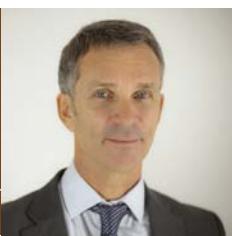
As if all these images were not enough, large databases of images are gradually becoming available on the Web. These images come with anonymized data on the patient's history and pathology, and can be accessed remotely to confirm a diagnosis or for statistical studies. With this proliferation of medical images, informatics and the computational sciences have become vital to exploit this over-abundance of complex data rigorously and optimally, so as to extract the clinically relevant information. The methodological framework unifying the analysis and simulation of images is the digital patient. It consists in a set of computational models of the human body combining computer data and algorithms to simulate *in silico*, i.e. with a computer, the anatomy and physiology of tissues and organs. These algorithms themselves rely on mathematical, biological, physical, and chemical models of life forms on different space and time scales.

As in Rembrandt's painting, the personalized computational model can be projected in images to facilitate their interpretation, and therefore support diagnosis. The personalized model can also further prognosis by simulating the evolution of a pathology, and then support therapy by planning and simulating an operation, or by controlling it by means of intra-operative images. This is the future of computational medicine, at the service both of physician and patient. ■

### Excerpts from the inaugural lecture 10 April 2014

Source: *La lettre*, no. 39, March 2015

- The Inaugural Lecture to be published by Éditions Fayard and made available online.
- A video of the Lecture is available at [www.college-de-france.fr](http://www.college-de-france.fr), on the professor's page.
- Nicholas Ayache also organized a symposium on the same subject (see p. 65).
- The Chair is funded by INRIA.



Nicholas AYACHE  
Senior Researcher, INRIA



# TWO NEW INSTITUTES

at the Collège de France



## TWO NEW INSTITUTES

The renovation of the Collège de France's Building E is now complete, and final technical adjustments were made before the inauguration [by François Hollande, President of the Republic, on 17 March 2015].

This rehabilitation concludes three successive stages of large-scale construction work carried out at the Collège de France over the last twenty-three years. The seven-storey, 7,000 m<sup>2</sup> building will house the offices and laboratories of the institution's physics and chemistry researchers, an international centre for Annual Chairs and visiting professors, and shared scientific services and facilities. Behind the walls of the restored 1930s building, the renovated spaces, the renovated spaces organized around an inside patio provide a functional and particularly welcoming environment.

This new building perfectly reflects the Collège de France's tradition of closely combining experimental and theoretical research. It will host the Physics Institute and the Chemistry Institute, each comprised of three Chairs devoted to these disciplines, as well as their teams of junior researchers.

These two institutes are located near the Centre for Interdisciplinary Research in Biology (CIRB), headed by Prof. Alain Prochiantz, and based in the adjacent building since 2011. The reconstruction work, carried out since 1991 at the initiative of Prof. Jacques Glowinski (Collège de France Administrator from 2000 to 2006), has been designed to foster fruitful interaction between disciplines, facilitated by the architectural communication between the buildings. In the final stage of the work, a spacious terrace was added at the top of the building.

The Bettencourt Schueller Foundation's support was instrumental in the development of the programme to rehabilitate the laboratory buildings

In this special report, Prof. Jean Dalibard presents the Physics Institute and Prof. Marc Fontecave, the Chemistry Institute. Prof. Alain Prochiantz reminds us of the organisation of the CIRB, which preceded the newly created institutes. ■



# The Physics Institute

**The Collège de France's Physics Institute is a new research centre set up on the historical Marcelin-Berthelot site. Its establishment follows a long tradition that was recently illustrated by that of Louis Leprince-Ringuet's, Marcel Froissart's and Pierre-Gilles de Gennes's laboratories. The Institute is comprised of three physics Chairs and a junior research team incubator, surrounded by efficient technical and administrative services. In total, about one hundred researchers, engineers, technicians, administrative staff and students share the three floors of the entirely renovated building.**

In this institute, the teams of Serge Haroche (Quantum Physics) and Jean Dalibard (Atoms and Radiation) carry out experimental research, manipulating material and photon particles to propose new tools for the quantum treatment of information and to shed light on new phases of ultra-cold matter. Antoine Georges's team (Physics of Condensed Matter) studies the theoretical aspects of the properties of quantum systems comprised of a large number of particles (electrons or atoms) with strong correlations, in close collaboration with materials physicists and chemists.

The junior research team incubator, the fruit of a partnership with the CNRS, will ultimately include five independent research groups. The first call for proposals was launched at the end of 2013, and the first two winning teams were selected. Çağlar Girit is carrying out research focused on mesoscopic physics, using graphene and Josephson junctions, and Alexei Ourjoumstev is studying new regimes of light-matter interaction, with applications in quantum information processing and the development of new sensors.

The Institute's scientific activity therefore covers a vast field of research, both theoretical and experimental, which lies at the crossroads between atomic physics, optics, solid-state physics, and materials science. This multidisciplinary research relies on high-tech infrastructures: a mechanical workshop equipped with high precision machine tools, fast computing systems, a helium circuit for cryogenics, and a clean room for sample preparation.

The Physics Institute is heavily involved in teaching science. Annual lectures linked to the Chairs address a very broad audience interested in "research in the making". Moreover, most members of the Chairs' teams and that of junior teams teach at the undergraduate, Master's or PhD levels. The teaching takes place at the École Normale Supérieure, at the PSL Research University or within other institutions linked to the Physics Institute, such as the Pierre et Marie Curie University and the École Polytechnique.

## The Institute's Physics Chairs

Prof. Serge Haroche's research team studies matter-radiation coupling at the threshold where a single atom interacts with a few photons stored in a modern equivalent of Einstein's famous "photon box", here developed using superconductive mirrors. This very simple system, which the fundamental premises of quantum physics account for, illustrates the least intuitive quantum behaviours, like the superposition of states or the measurement postulate. It allows for a same photon to be seen multiple times, without being destroyed, and for light's quantum jumps to be observed. With it, scientists can explore quantitatively the threshold between the strange quantum world that enables Schrödinger's famous cat to be both dead and alive, and the classical world, the only one that is accessible to our senses, where cats are either dead or alive. Finally, it constitutes the prototype of a system that processes information using these remarkable properties of quantum logic. The research carried out by the physics of condensed matter research team, headed by Prof. Antoine Georges, is primarily concerned with the materials in which electrons strongly interact between themselves, like transition metal oxides. These strong interactions lead to remarkable physical properties (like superconductivity), which endow these materials with functionalities that lend themselves to innovative applications. In this field, strong synergy will develop with the chemistry Chairs and research teams, also located in Building E, particularly with regard to energy materials.

Prof. Jean Dalibard's team studies the collective behaviour of atoms cooled to an extremely low temperature (microkelvin and below). This temperature is reached by irradiating the atoms with laser beams at a carefully chosen frequency; the atoms are then trapped in "cages of light". The properties of these ultra-cold gases are very different from those of regular fluids, due to the important role played by the quantum nature of the atoms' motion. These gases present a superfluid behaviour, that is, they can flow around an obstacle without friction. ▶

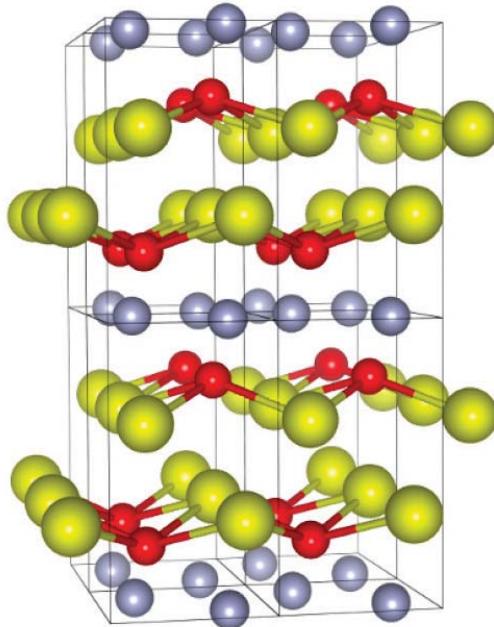
## TWO NEW INSTITUTES

► These assemblies of cold atoms make it possible to simulate the behaviour of other systems that are still poorly understood, like certain classes of superconductor materials or astrophysical objects such as neutron stars. Cold atoms also have many applications in metrology, with the development of new clocks and high-precision sensors (gravimetry and accelerometry).

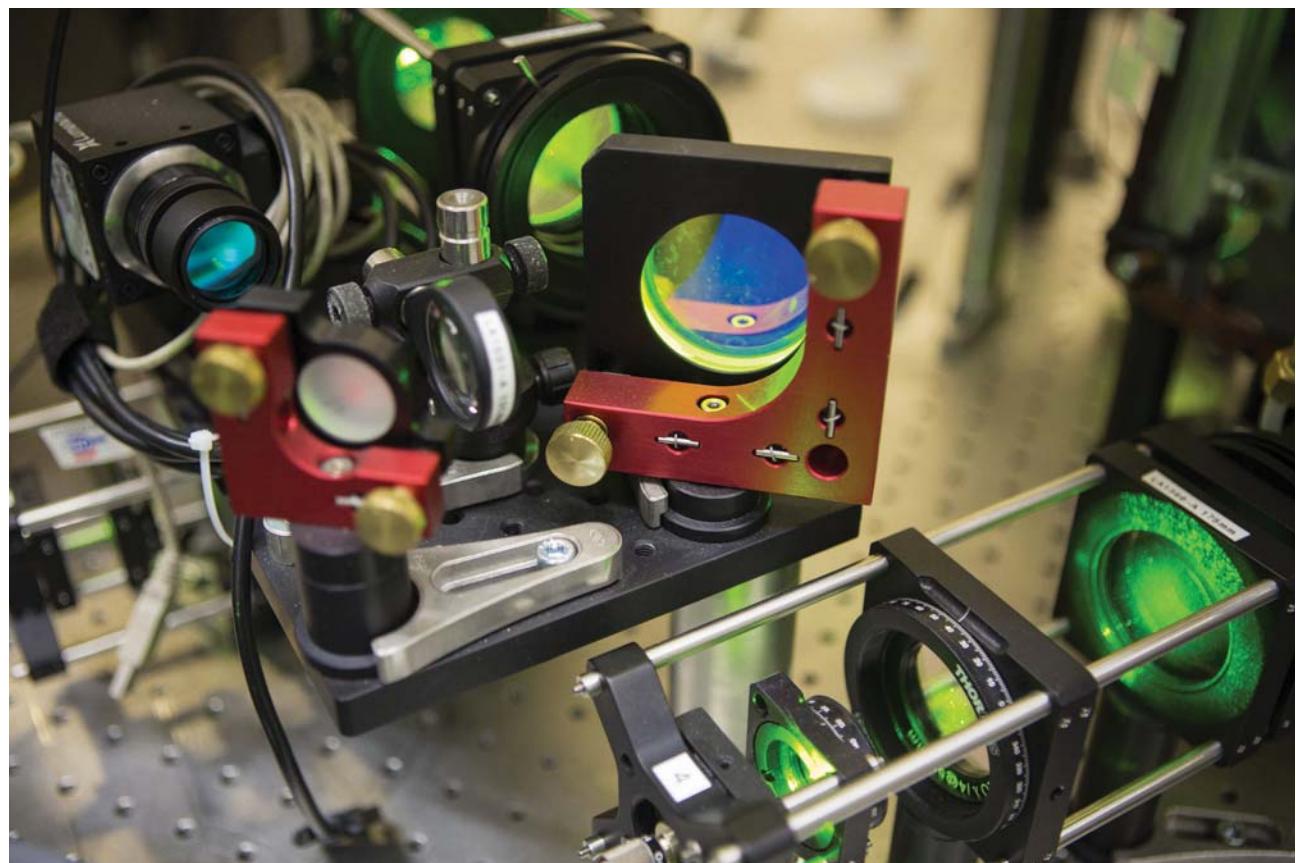
Serge Haroche's and Jean Dalibard's groups are Kastler Brossel Laboratory research teams, of which the Collège de France is a trustee, alongside the École Normale Supérieure, the Pierre and Marie Curie University, and the CNRS. Antoine Georges' team is affiliated to the École Polytechnique's Theoretical Physics Centre.

### Physics and chemistry at the Collège de France within PSL and in the Île-de-France research network

The Fondation Paris Science et Lettres (PSL), of which the Collège de France is a founding member, plays an active role in reinforcing scientific synergies between its members' physics, chemistry and biology teams. In particular, it enables research groups to circulate easily from one institution to another, and affords special access to the technological resources available in each of them. The Initiative d'Excellence endowment, awarded to PSL, provides the funding for new transdisciplinary research projects and the creation of international Chairs.



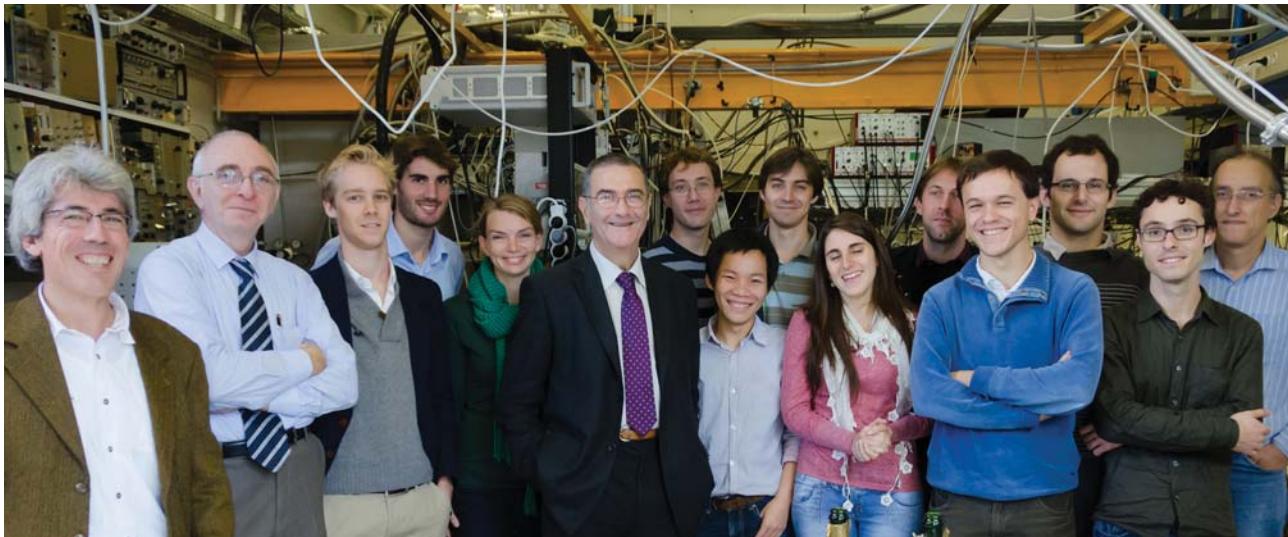
Crystalline structure of cerium fluorosulfide, a red pigment studied in Prof. Antoine Georges' team. Certain iron-based superconductors have an analogous structure.



Preparation of laser beams for a cold-atom experiment (Prof. Jean Dalibard's team)

**Prof. Serge HAROCHE**  
Quantum Physics  
**Prof. Antoine GEORGES**  
Physics of Condensed Matter





Prof. Serge Haroche (centre), surrounded by his colleagues Michel Brune and Jean-Michel Raimond, and his team

The Physics Institute as a whole naturally has special relations with the physics department of the École Normale Supérieure, in both research and the pooling of scientific equipment. Moreover, together the École Normale Supérieure and the Collège de France's Physics Institute have authority to contribute to second-year Master's teaching and to high-level PhD supervision. In particular, researchers residing at the research-team incubator are encouraged to take an active part in teaching at the École Normale Supérieure.

The Collège de France's ties with the Pierre and Marie Curie University are reinforced by its welcoming teams from the Kastler Brossel Laboratory, the Laboratory of Condensed Matter Chemistry of Paris and the Laboratory of Chemistry of Biological Processes. The research of Antoine Georges and his group directly involves the École Polytechnique. Finally, the Laboratory of Chemistry of Biological Processes actively collaborates with the École Normale Supérieure and the CEA. ■

**Prof. Jean DALIBARD**

Source: *La lettre*, no. 38, June 2014

### A Junior Research Team Incubator at the Collège de France

The Physics Institute provides a particularly favourable scientific and technical environment for hosting the Junior Research Team Incubator headed by Michel Brune, a member of the Kastler Brossel Laboratory who collaborates with Serge Haroche. The Physics Institute's Junior Research Team Incubator is the fruit of an alliance between the Collège de France and the CNRS (USR 3573, the "Jeunes équipes de l'Institut de physique du Collège de France").

Each team's project leader defines their research theme entirely independently from the Chair teams. Themes may cover the full spectrum of current research in physics, and in particular explore overlaps with chemistry, biology and materials science.

Teams are recruited through calls for projects, which are open to researchers having defended their thesis less than ten years prior to applying, with significant post-doctoral experience and a detailed research project.

These teams benefit from laboratory and office space, as well as material and administrative support. The four-year contract may be renewed for an additional period of the same duration

if the teams' scientific output so justifies and funding for further research can be found. In the long term, the incubator may host up to five groups of independent researchers.

The aim is for the incubator to provide project leaders with an ideal material and intellectual environment to foster innovative research projects to emerge and develop to maturity, when they will be able to obtain a permanent position in another institution.

#### *Winners of the 2013 call for projects*

Çağlar Girit and his team will be conducting research on mesoscopic physics, using graphene and Josephson junctions. Alexei Ourjoumtsev's team will be studying new forms of interaction between light and matter, with applications in quantum computing and new sensors.

**Prof. Jean DALIBARD**  
Atoms and Radiation



# The Chemistry Institute

Chemistry at the Collège de France has received particular attention over the last few years.

After the departures of Profs Jean-Marie Lehn and Jacques Livage, new ambition for developing this discipline has led to the creation of several Chairs: Prof. Marc Fontecave's Chair of Chemistry of Biological Processes in 2008, Prof. Clément Sanchez' Chair of Chemistry of Hybrid Materials in 2011, and the Chair of Chemistry of Materials and Energy, which Prof. Jean-Marie Tarascon has held since 2014. For the first time in the history of the institution, the Collège de France therefore hosts three chemistry Chairs.

With the end of the extensive reconstruction work at the Collège de France, the three Chairs now share the same premises: the Institute of Chemistry. This institute brings together the three laboratories affiliated to it: the Chemistry of Biological Processes laboratory headed by Marc Fontecave, the Laboratory of Condensed Matter Chemistry of Paris headed by Clément Sanchez from 1999 to 2013, and the Chemistry of Materials and Energy laboratory headed by Jean-Marie Tarascon. This set up was clearly designed to create a chemistry research centre of excellence, based on the three Chairs' complementarity.

Marc Fontecave's laboratory, whose work is located at the interface of chemistry and biology, studies the mechanisms and structures of the complex enzymatic systems that are found in living organisms and participate in metabolic or biosynthesis reactions, the biosynthesis of essential organic and inorganic cofactors, and the selective modification of nucleic acids. As of recently, it has a protein crystallography platform, installed at

the Collège de France. These systems are studied primarily for their potential applications as therapeutic targets or biocatalysts in energy conversion systems. On that basis, the laboratory develops original bio-inspired chemistry approaches, seeking to imitate enzymes' active sites to invent new synthetic catalysts, which can be potentially useful in artificial photosynthesis processes leading to hydrogen production or CO<sub>2</sub> valorization.

Prof. Clément Sanchez is a specialist in materials chemistry. His research group develops methods for synthesizing original materials and nanomaterials, using molecular precursors – including ones of biological origin – to control the crystalline structure, homogeneity, size, porosity, and morphology of these materials. Soft chemistry methods in particular are applied, involving temperature, pressure and solvent conditions that allow for the incorporation of biological molecules. This research requires one to have competences in the characterization of materials: solid-state NMR, X-ray diffraction and scattering,



Prof. Jacques Livage, Prof. Clément Sanchez and the team of the Chair of Chemistry of Hybrid Materials

**Prof. Jean-Marie TARASCON**  
Chemistry of Materials and Energy  
**Prof. Clément SANCHEZ**  
Chemistry of Hybrid Materials





Prof. Marc Fontecave and his team

diverse microscopies and interface analysis. The projects aim to foster technological development and applications in the fields of energy (materials for catalysis and photocatalysis) and health (imaging, therapeutic targeting, biomaterials, etc.).

Materials chemistry plays a major role in the developments of the chemical industry. Today, new materials must be more sophisticated, miniaturized, robust, recyclable, environmentally friendly, energy efficient, and cheaper. Jean-Marie Tarascon represents this field at the Institute, particularly through his innovative research on energy storing. His laboratory develops new, cheap, and efficient materials in which nano-structuring plays a major role, for the production of original electrodes to be used in electric vehicle batteries. It also studies organic materials from biomass (sugars, organic acids) so as to invent new "green" batteries made with renewable electrodes.

The Chemistry Institute, thus comprised of three Chairs and of three laboratories that are interestingly complementary, with some fifty researchers and sixty PhD students and post-docs, is involved in significant large-scale research on the synthesis of molecules and various materials, from their detailed characterization using modern tools to their technological transfer systems. Alongside the pursuit of a wide variety of projects, the Chemistry Institute has the clear strategic aim of positioning itself in the field of new energy technologies. The strengths of the three laboratories can work in synergy, particularly to create hybrid, solid, molecular and bio-inspired (nano)materials with catalytic, photocatalytic and electrocatalytic properties that will allow the elaboration of new membranes and

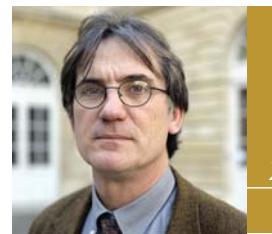
catalysts for fuel cells, photo-electrolysers, and batteries. While collaboration already exists between the Institute's different laboratories, uniting these scientific forces geographically can only increase their strength. The proximity of physicists like Antoine Georges and his team, specialized in the theoretical study of the electronic properties of materials – for example transition metal oxides –, opens up exciting prospects, at the Collège de France, for the development of projects at the chemistry-physics and theory-experiment interfaces.

Finally, this institute, located in the centre of Paris, aspires to be a driving force in the field of chemistry, through both its interactions with the Pierre and Marie Curie University's outstanding chemistry research and through its participation in the Paris Science et Lettres research university. Within this environment, it can hope to develop chemistry both in the field of fundamental research and in that of engineering. The twofold orientation can have an original impact on the training of junior chemists (Master's, PhD and engineering students) and on relations with industry. It thus enables the institute to follow a policy of innovation and active technology transfer. ■

#### **Prof. Marc FONTECAVE**

Source: *La lettre*, no. 38, June 2014

**Prof. Marc FONTECAVE**  
Chemistry of Biological Processes



## TWO NEW INSTITUTES

# The Centre for Interdisciplinary Research in Biology

**The Centre for Interdisciplinary Research in Biology, CIRB, is a joint research unit under the supervisory authority of the Collège de France, INSERM and the CNRS.**

It was born out of the desire to create a dynamic and attractive research environment on the Collège de France Marcellin-Berthelot site. Following the opening of new spaces dedicated to research and with the implementation of governance prefiguring the creation of the CIRB in 2009, it was impossible to ignore the need to attract teams capable of carrying out high-level research in biology on the Marcellin-Berthelot site.

The organizing principles of the CIRB, which now counts eighteen teams [in 2013/2014], are the following. With the exception of the teams headed by Chairholders and a limited number of Chair teams, the teams are recruited through international calls for projects submitted to an international scientific committee. These calls are either open to all disciplines, or are thematic if this kind of project is deemed appropriate within the framework of the centre's scientific policy. A junior researcher working at the centre can become team leader, provided that the change of status has been approved by an international scientific committee or has undergone an international evaluation.

A call for projects generally receives about forty applications, ten of which are selected by existing team leaders for an interview by the scientific committee. While interviews, which take the form of seminars, are open to all CIRB members, only members of the committee are involved in the ranking of the projects. The committee provides a short list to the head of the centre who recruits two to three projects for each call for proposals. The selection of the teams must be approved by the Faculty, which therefore has full visibility into the research in biology carried out at the Collège de France. The recruited teams are (and must remain) limited in size (they comprise fewer than ten people), with leaders under the age of forty at the time of their recruitment, even though exceptions sometimes need to be made. They are recruited for a four-year residency, which can be renewed once. The team leaders' youth and the teams' research outcomes during their time at the Collège de France are intended to facilitate outgoing teams' integration into other research centres.



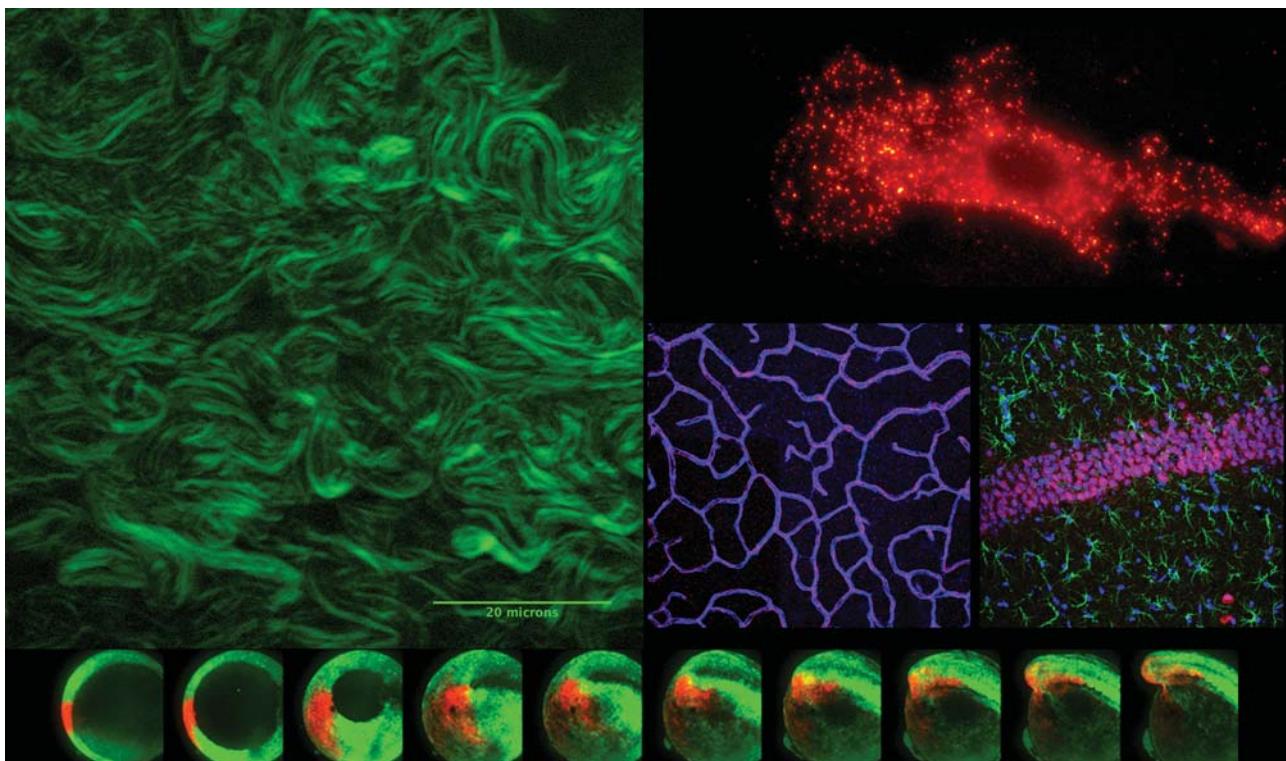
## TWO NEW INSTITUTES



For attracting very high-level junior researchers, who are necessarily courted by other research centres at the national or international levels, the Collège de France offer needs to be competitive. This means that the team must have total scientific independence, access to state-of-the-art technological tools and to all the resources traditionally made available to Chairs, particularly the temporary teaching and research assistant (ATER) and lecturer positions, as well as the possibility of organizing meetings and symposia on the Marcellin-Berthelot site. As regards the CIRB itself, it has to operate democratically, and this is ensured by a committee of team leaders, which deliberates and votes on all aspects of its scientific policy. A laboratory committee has been set up to intervene in an advisory capacity on the policy implemented by a board comprised of the director, the deputy director and the administrative secretary of the CIRB.

As noted above, the CIRB is currently comprised of eighteen independent teams, bringing together about two hundred people (half on fixed-term contracts, mainly students and post-docs) working in different fields of biology. At present, the fields covered are cancer research, neurosciences, infectious diseases, cardiovascular research, developmental and regeneration biology, cellular biology and mathematical modelling. While this diversity is an asset, interdisciplinary interaction must be facilitated by various means. These include:

- holding regular seminars to which external colleagues are invited;
- organizing a weekly presentation by students and post-docs of their work, in English, to the centre's researchers, engineers, and technicians;
- holding a monthly meeting during which a team leader presents his/her team's work to the other team leaders;
- organizing a retreat for all students and post-doc every two years (two of which have already taken place). A retreat for all staff (also every two years) is planned. On a financial level, the CIRB pools 25% of the recurrent grants from the Collège de France, the Inserm and the CNRS, which represents about €950k. The remaining 75% are shared between the teams, according to their scientific discipline and size. The teams are also funded through research contracts for about 75% of their running expenses and 50% of their consolidated budget. These contracts are managed by team leaders and the practical aspects of this management are dealt with by the CIRB's general secretary and its administrative team. The running costs of the technological platforms (imaging, animal houses, and histology for the most part) are met by the teams according to their use thereof, under the control of platform managers and committees. The team committee votes on shared expenses at two meetings, the one in January and the other in June. An additional deduction from the teams' budgets may be voted on in June of each year. ►



Examples of images obtained in fluorescence microscopy, Prof. Alain Prochiantz's team (photomontage: France Maloumian)

► The CIRB is located on the Marcelin-Berthelot site, and its policy takes into account the presence or arrival of the physics and chemistry laboratories. The CIRB directorship wishes to develop strong interactions with these other experimental sciences. One way of doing so is by recruiting teams working at the interfaces of these three disciplines, as is the case of mathematics, through the recruitment of two teams of mathematicians interested in biology, and by welcoming Prof. Gérard Berry, Chair of Algorithms, Machines and Languages, within the premises of the CIRB.

Apart from these interactions taking place at the Collège de France, the CIRB fosters close relations with the Montagne Sainte-Geneviève centres and institutes. An important practical modality of these relations is the existence of a laboratory for excellence (Labex Memolife), which brings together the CIRB teams, those of the École Normale Supérieure Institute of Biology, and three ESPCI ParisTech teams. In addition to a joint retreat for the Labex team leaders, these relations involve staff funding (post-docs, welcoming foreign students and fourth-year PhDs), the purchase of shared equipment, and sharing certain technological platforms. The CIRB was thus spared the expense of setting up proteomic and functional genomic platforms. Still within the framework of excellence initiatives, CIRB teams have access to the calls for projects put out by PSL to fund joint work by teams of distinct research centres, mainly – for biology – the Collège de France, the Institut Curie, the École Normale Supérieure and the ESPCI ParisTech. In concrete terms, together this Labex and PSL funding represents an annual consolidated budget of about €350k for CIRB teams.

As director of the CIRB, I am fully aware of the change in governance that the appearance of this new research structure on the Marcelin-Berthelot site has represented and still represents. We embarked on this path with the former Administrator Prof. Pierre Corvol because it was required by the need to develop research in biology at the Collège de France on a par with the

facilities made available thanks to Prof. Jacques Glowinski's personal and passionate engagement, and to the intellectual aura of the Collège de France. While the first steps – the CIRB officially opened in January 2011 – have been promising, nothing is definitively achieved and we need to maintain our efforts, particularly during a period made very difficult by the budgetary restrictions affecting fundamental research.

The CIRB teams and I are optimistic, however; not only because we are still relatively privileged compared to other institutions, but also because the CIRB's policy corresponds to the Collège de France's more general policy. We thus benefit from the help and support of the Direction Générale des Services (General Services Division) and its specialized administrative and technical departments. I would therefore like to conclude this brief presentation of the CIRB by thanking all Collège de France staff, whose commitment and competence we appreciate every day. ■

**Prof. Alain PROCHIANTZ**

Source: *La lettre*, no. 38, June 2014



**Prof. Alain PROCHIANTZ**  
Morphogenetic Processes

# European Heritage Days at the Collège de France

## 19-20 September 2015

*The Collège de France will be open to the public on Saturday 19 and Sunday 20 September for this year's European Heritage Days, the theme of which will be "the heritage of the 21st century, a history of the future".*

On this occasion, the Collège de France will present the renovation and architectural restructuring project that will integrate contemporary architecture into a protected historical setting, and will give the Cardinal-Lemoine site a new heritage value. The scale model of the future renovated site and a 3D film will enable visitors to see how the architect, Jacques Moussafir, starting with a nineteenth-century building, has designed a twenty-first-century heritage.

This architectural project is intended to accompany and to serve the currently ongoing and particularly original scientific project of the Institute of Civilizations. It will federate the social sciences and humanities research and teaching units housed on the site, while preserving their distinctive characteristic: the symbiosis between research and documentation. Here, Chairs, laboratories, research teams and specialized libraries work in close cooperation in the fields of social anthropology, the ancient Near East and Far East, and the ancient, medieval and modern Mediterranean.

A unique temporary exhibition will be held in the main lobby of the Place Marcellin-Berthelot site, devoted to objects and documents from the valuable collections of the Institute of Civilizations' libraries, and to closely associated research work. Visitors will also be able to consult the portal *Salamandre* providing access to the Collège de France's digital library. They will thus have the opportunity to familiarize themselves with the digitization of scientific and historical documents, which also constitutes a "future history" of the heritage, of its protection and promotion, and of the evolution of mediation techniques.

Several films will be shown continuously in the Marguerite de Navarre lecture hall, to illustrate the Institute of Civilizations' project, as well as key personalities and events in the Institution's scientific history.

At 3 pm on Saturday 19 September a round table in the Marguerite de Navarre lecture hall will invite the audience to reflect on the "[Dialogue between Civilizations](#)".

During these two days, the Collège de France will also enable the public to visit the heart of the historical Marcellin-Berthelot site with its courtyards, its neo-classical sculptures and architecture, its Italianate façades and décor, and its vaulted halls and archaeological vestiges bearing witness to Gallo-Roman and medieval history.

Works illustrating the continuity of the experimental scientific research carried out in the laboratories on site will be presented in the Faculty Hall.

A large number of visitors is expected for this event, as a total of 5,000 attended the previous Heritage Days at the Collège de France, in 2011.

**Marylène MESTON DE REN, General Director of Services**

Extract from the *Hie Sannō matsuri*  
(Hie Shrine Festival) scroll, ca. 17th century.  
Louis-Kreitman Collection, Institute of Advanced Japanese Studies, Collège de France

# The Collège de France Institute of Civilizations

**The Cardinal-Lemoine site will undergo an important phase of internal and external redevelopment. The building work, which should start in the summer of 2016, will be completed in 2018/2019. The entire site will then become the Collège de France Institute of Civilizations.**

**Can you present the organization of this new structure?**

Until now, the Cardinal-Lemoine site hosted a number of Chairs that were established there ad hoc, and that happened to bring together research interests as well as highly specialized libraries. Many of these had no equivalent in France or even in the rest of the world. From there came the idea of creating an institute of civilizations, to give them more visibility. The Institute therefore has a concrete reality: it is a site that belongs to the Collège de France and that brings together professors, researchers and libraries, following a certain rationale.

The Institute will be comprised of four centres, which represent its main orientations:

The anthropology centre, established around Prof. Philippe Descola's Chair, which studies the foundation of all these civilizations: human beings. Quite logically, this centre comes first. It hosts the very large Anthropology Library that we inherited from Claude Lévi-Strauss (Social Anthropology, 1959-1982).

The Ancient Mediterranean centre, covering the whole Mediterranean basin, and which corresponds to our Western culture. It hosts the large Byzantine Library, already on site, and the Library of Turkish Studies, around two Chairs that have just been created: Ancient Byzantium, and the Origins of Islam. Either concretely or simply through collaboration, this centre will be completed with Chairs studying the Ancient Greek and Roman civilizations: currently that of Prof. John Scheid (Religion, Institutions and Society in Ancient Rome), and previously that of Prof. Denis Knoepfler (Epigraphy and History of the Ancient Greek Cities, 2003-2014).

The Ancient Near-East centre. It hosts the Libraries of Assyriology and Western Semitic Studies, which until now were part of the Ancient Near East Institute (this name will probably be changed for clarity). Add to this of course Egypt and its large library, and all of the Near East is represented. This centre is therefore currently comprised of three Chairs: that of Prof. Nicolas Grimal (Pharaonic Civilization: Archaeology, Philology, History), that of Prof. Dominique Charpin (Mesopotamian Civilization), and my own Chair of the Hebrew Bible and its Contexts.

The Ancient Far East centre, which includes documentary collections extending from Iran and Iraq to Japan. It brings together the Chair of Prof. Anne Cheng (Intellectual History of China) which studies Confucian philosophy, that of Prof. Jean-Noël Robert (Philology of Japanese Civilization) on Japan and its Buddhist traditions, and that of Prof. Frantz Grenet (History and Cultures of Pre-Islamic Central Asia), which links up the Near East and the Far East.

The African and American continents are of course still missing, although they already feature in the research of the anthropology centre. The Institute of Civilizations already includes a considerable number of people who offer different perspectives on these different civilizations.



#### What are the missions of the Institute of Civilizations?

The purpose of the Institute of Civilizations is really to foster knowledge sharing across boundaries – the interdisciplinarity so dear to the Collège de France. It will not just be an administrative grouping, but a very concrete reality, which will materialize through common activities. In addition to bringing the libraries together on the same site, the Institute will organize interdisciplinary symposia, as well as more long-term projects (of the ANR type), in which several but not necessarily all the professors will be involved around common questions. The Institute will also endeavour to forge contacts with colleagues from other universities, in Paris, in France and abroad. It will continue to host research teams, as is already the case, notably for the geographical area of Korea.

The Institute of Civilizations also has the mission of joining together two things that until now were sometimes difficult to reconcile: the permanence of the libraries and the independence of the Chairs, which may not be renewed with the same title. The idea is the following: when a professor retires, the libraries must have sufficient consistency, thanks to the librarians and the resident research teams, to allow for real continuity, irrespective of the nature of the new Chairs subsequently created.

We thus wish to protect the great freedom that the Collège de France has for reorganizing itself at the level of the Chairs, while maintaining excellence for the libraries. This is possible only if there is continuity in the libraries activities and supervision.

#### How will Institute's libraries function?

The professors concerned agree on the fact that we should not create a single large library. The four centres will each have their own, identifiable and highly specialized libraries, which will allow the professors and the Chair teams to communicate directly with the relevant library. In fact the researchers' offices will be at the very heart of the libraries, which are the equivalent, for the humanities, of laboratories for scientific disciplines. Groupings will of course be possible, but that remains to be defined.

Following an essential research approach, these libraries will be free and open to researchers, including those who are not directly linked to the Chairs and who may come from elsewhere: PhD students, or Master's students recommended by their supervisor. ■

**Interview by Sarah LACOSTE, Cultural Affairs and External Relations Division**

*Source: La lettre, no. 39, March 2015*

**Prof. Thomas RÖMER**  
The Hebrew Bible and its Contexts





CLIMATE AND ENVIRONMENT

# Can Europe Rise to the Challenge?

The Collège de France had the immense honour of welcoming the President of the French Republic François Hollande and his Majesty King Carl XVI of Sweden for the opening of the symposium “Climate and Environment”, which took place in the Marguerite de Navarre lecture theatre on 3 December 2014

Kebnekaise massive,  
Sweden





After Administrator Serge Haroche briefly opened the symposium, he handed the floor to François Hollande and the King of Sweden, who each in turn stressed the crucial importance of the climate issue and the need to make it central to social and economic policy, in Europe and the rest of the world. France and Sweden are both particularly sensitive to the challenge posed by the climate. All the speakers reaffirmed the ties between the two countries, which are united by a shared ambition for the years to come, as well as the desire to build more bridges between government and business. The two countries were particularly well represented: present alongside a large Swedish delegation were Ibrahim Baylan, Sweden's Minister for Energy, Karin Wanngård, Mayor of Stockholm, and Veronika Wand-Danielsson, Sweden's ambassador to France, as well as Sérgolène Royal, France's Minister of Ecology, Sustainable Development and Energy, and Geneviève Fioraso, State Secretary for Higher Education and Research.

In less than a year's time, Paris will exemplify the importance of Europe's role in climate and environmental reflection and action, by hosting the 2015 Paris climate conference, COP21, from 30 November to 11 December 2015. France was officially named host country of the 21st climate conference, and the COP21 will be one of the largest international conferences ever organized in the country.

## Symposium Opening Address by Administrator Serge Haroche

On behalf of the Collège de France, I am honoured to welcome you to this symposium on the climate and environmental challenges faced by Europe, organized in conjunction with the Stockholm Environment Institute and the Institute for Sustainable Development and International Relations. This symposium is taking place on the occasion of the State visit of their Majesties the King and Queen of Sweden, to France at the invitation of the President of the Republic.

For the first time in the Earth's history, a biological species has become the dominant agent governing the evolution of the planet's climate and biosphere. For hundreds of millions of years, this evolution was governed by blind natural forces, continental drifts, glaciations and global warming, as well as flips of the Earth's magnetic field, the effects of which were felt over long timescales, counted in millions of years.

**By contrast, humanity is now exerting decisive pressure on the Earth's equilibrium, inducing very rapid changes on the scale of a century. Like the unconscious agents of past ages, will it be a blind force, unable to alter the course of that which it has triggered?**

Or will we be able to use our intellect to accompany the evolution that we are bringing about, to control its effects and maintain acceptable living conditions, both for ourselves and for the species with which we share the planet? If there is to be a positive answer to the latter question, we need to foster constructive dialogue between science and politics. Only science can objectively observe the state of the Earth and its evolution, estimate probable temperature and ocean level changes, and evaluate their long-term consequences. This also allows science to tell us what can be done to moderate the expected changes or to adapt to them, and what realistic action can be envisaged, taking into account the laws of physics which, unlike those promulgated by humans, cannot be repealed or amended at will.

The powers that be must therefore make choices to decide on desirable goals. Their desirability depends on economic, socio-logical and even psychological factors, and must be defined once the realm of possibilities has been scientifically evaluated, not the reverse, as has often been the case. For example, ideal proportions to reach at national or EU level, between nuclear, thermal and renewable energies, must be determined not on an ideological basis but on that of serious estimates of the feasibility of energy storage, transportation and flexible production systems, and on precise considerations of scale. The solutions to the problems facing the world can therefore stem only from serious dialogue between scientists and politicians – dialogue made all the more necessary by the complexity of climate and energy challenges and their close interconnection.

Time is a crucial factor to take into account in this dialogue. The necessary actions will have to be carried out swiftly, on the ►



► scale of the decisive century that lies ahead, but will have to be considered slowly in the time frame of politics. Democratic countries live to the rhythm of frequent elections and rulers naturally want their supporters to enjoy the results of their decisions without having to wait. They must also bear in mind the difficulty of sensitizing an electorate that is experiencing economic difficulties in the present and will be subjected to further events in twenty, thirty or a hundred years' time. Science, unlike politics, is built on the long term; it evolves on the scale of the decade rather than the year. Current innovations are the fruit of research that began long ago. A striking example is LEDs, the development of which was rewarded with the Physics Nobel Prize. In the future, these highly energy-efficient sources of white light may provide urban lighting, not to mention their many other applications. The fundamental discovery that led to this innovation, that of blue-light emitting diodes, dates back to the 1980s. Research takes time and will always take time, just as, by definition, its progress is unpredictable. Most of the discoveries that have profoundly changed our everyday lives over the last fifty years – the laser, the computer, Internet – stem from fundamental research fuelled by the curiosity of researchers who had not imagined what new technology their discoveries could produce in the long term.

No matter how impatient we are to see problems solved, it is impossible to short-circuit this long journey. Controlling climate change and developing alternative energies cannot result from artificially programmed action with a fixed schedule, decided on bureaucratically. Success will depend on the evolution of multiple projects, initiated by researchers themselves, and on massive support for fundamental research, the progress of which will gradually open up new, as yet unpredictable pathways for applied research.

To succeed together in the critical period of a few decades awaiting humanity, science and democracy will have to reconcile their different rhythms and together make the emergence of technological solutions, along with mindsets and lifestyles, move forward. This is the immense challenge facing Europe and our civilization at large.

## Speech by François Hollande, President of the Republic

We are at the Collège de France, an eminent place of knowledge, a source of pride for our country, for its research, and for the women and men who devote themselves to scientific progress. It is important for us to be able to discuss the question of our future and our climate here, in this distinguished place of knowledge, and of its production and its dissemination. We must always foster dialogue between science and democracy, as Mr Serge Haroche has just done. Democracy has its rhythms; science has plenty of time, but it is also on alert. It knows that its work will lead to decisions being made.

**Democracy – even if it is subject to the constraints of elections, and that is a good thing – must make long-term choices. The first is to give research the means to develop. The second is to make decisions that will have consequences far beyond those who made them.**

Politics also involves understanding that there are interests exceeding those that brought me where I am today, and that there is honour and even dignity in being able to act on future generations. This dialogue between science and democracy also shows us where we stand. All experts are now virtually unanimous. They may often contradict one another, but this simply allows science to evolve ... What do these experts tell us? First, that climate change is a reality; it has even accelerated. This is undeniable scientific data. The influence of human activities has been demonstrated: there is a direct link between global warming and the accumulation of anthropogenic greenhouse gases. The global temperature will therefore increase by far more than two degrees by the end of the century if we do not take action. It is even probable, if not certain, that if we remained indifferent, blind or apathetic, the planet's temperature would not only increase by three, but rather by four or even more degrees. We are also aware that if global warming unfolds at this pace, there will be climate disasters, endangered biodiversity, rising sea levels, and immense health and food challenges. Some territories are already disappearing. Several countries have alerted us, particularly those we call islands. Both in the Pacific and in the Indian Ocean, they have told us that part of their territory will be engulfed. I would like here to salute the IPCC's work [Intergovernmental Panel on Climate Change] – and Jean Jouzel's presence – that has afforded us an understanding of these facts, including in France. ►



Photographs (from left to right)  
His Majesty the King of Sweden Carl XVI Gustaf,  
Ibrahim Baylan, Serge Haroche, Jean-Marie Lehn,  
Francois Weil, John Scheid, Francois Hollande, Ségolène Royal.



## CLIMATE AND ENVIRONMENT Can Europe Rise to the Challenge?

►In this country, we think that we are never affected by anything, whether health scourges or natural disasters, because France is a beautiful country. Surely that should protect it from all vices and misfortunes. But even in France, there will be rising temperatures, with their consequences on our coasts, increasingly scarce water resources and changes that could, by the end of the century, result in a part of the population no longer living where their forefathers had decided to settle. The second lesson scientists have to offer is more encouraging: it is that we can act. Solutions do exist, and they just need to be sufficiently firmly and responsibly implemented. France and Sweden have taken the lead. Sweden has set national objectives for 2020, some of the most ambitious worldwide – a 50% share for renewable energies – and has already reduced its greenhouse gas emissions by 23% over the 1990-2013 period. Sweden has also successfully reconciled environmentalism and growth, since Swedish national production increased by 60% over the same period. This means that Sweden has already reached the objectives that Europe has just set itself, without these measures having affected its growth. It even seems that the latter have stimulated growth. France also wishes to take the lead and demonstrate that green growth is possible. We are already one of the industrialized countries, which has the lowest greenhouse gas emissions. We have chosen a “France with new energy”. That is the intention behind the bill tabled by Mrs Sérgolène Royal and currently under discussion in Parliament. This “France with new energy” is an environmental choice: it means sending signals to investors and consumers, particularly through carbon costs, to make them aware of the consequences of their decisions. It is a social choice because the victims of the environmental crisis are generally those in the most precarious positions: lack of job security, fuel poverty, poor health, etc. It is also an economic choice, as new industries aim to develop means of energy saving, renewable energies, or simply to invent the materials of the future. Finally, it is a political choice because, like Sweden, France wants to be independent and therefore wishes to reduce fossil fuel sources. At some point this may alter its international political decisions. ■

**Excerpts**  
*Source: La lettre, no. 39, March 2015*

## Speech by his Majesty the King of Sweden, Carl XVI Gustaf

It is truly an honour to be launching this symposium on climate and energy.

**There is a fundamental need for sustainable development; it has been on the international agenda for a long time. I actually participated in the first United Nations conference on the environment held in Stockholm in 1972.**

Twenty years later, in 1992, the Rio de Janeiro summit took place. It is well known that since then the public's awareness of climate issues has increased. Thanks to science, we have learnt that climate change is a reality affecting our entire planet. Two or three months ago the IPCC report brought new facts to light, and I think that it is now essential for us to understand the extent to which climate change will affect and have an impact on future generations. We need to find an efficient way of meeting the challenges that we now face. I am nevertheless encouraged by what I see, namely, the solutions that are being developed in many areas to tackle climate change. I am also encouraged by the opportunities that this affords. In France (as in Sweden), it has been proven that emission reductions are possible and compatible with growth and economic development. This is why I think the energy transition towards lower emissions can offer potential in terms of economic growth and job creation, and thereby alleviate poverty and broaden access to universal healthcare. It must be said that the European Union has been a pioneer in this domain. I hope that this will continue, and that we will reach a strong commitment to fight climate change.

Ladies and Gentlemen, we all need to commit, we all need to work towards a new global climate agreement, to stay well below that two-degree temperature increase in relation to the industrial era. Next year in Paris, we will attend the COP21 under the French presidency. We will discuss the rights, obligations, and needs of our children and grandchildren, who will be a core concern when a new climate agreement is drawn up. Be assured that I will be keeping a very close eye on these developments.

Ségolène Royal, Minister of Ecology, Sustainable Development and Energy

## How to Reconcile Climate and Prosperity?

Tomas Tranströmer, a great Swedish poet enamoured with endangered nature, Nobel Prize Laureate for Literature in 2011, wrote in one of his anthologies: “Weary of all who come with words, words but no language, I make my way to the snow-covered island. The untamed has no words. The unwritten pages spread out on every side! I come upon the tracks of deer in the snow. Language but no words.” Or yet: “The wind walks in the pine forest. It sighs heavily, lightly. In the middle of the forest the Baltic also sighs, deep in the forest you’re out on the open sea.” As the Ster-Calderón report published last September has shown, the latest economic studies refute the idea that we have to choose between fighting climate change and global economic growth. It is a false dilemma.

How can we reconcile the climate and prosperity? This is the theme of this first round table that I have the honour of chairing, just as the Lima conference opened two days ago, the last round of negotiations before the COP21 to be held in Paris this time next year. Faced with global warming, which threatens our glaciers for example, be it on the south side of the Swedish Kebnekaise or in the French Alps, and the “language” of the stags and chamois who live there, some of our companies have already understood that they can change their mode of production in a way that is both profitable and environmentally friendly. The company Ericsson, for instance, which has been in second or third place in Greenpeace’s “Cool IT” ranking for the last four years, has been committed to a “sustainability and social responsibility” strategy for over twenty years.

The IPCC’s fifth report points out that on a global scale, economic losses attributable to disasters increased more than tenfold in the 1990s. The total costs double if we include the losses resulting from smaller-scale, non-disastrous meteorological phenomena that are making the insurance sector increasingly vulnerable. Conversely, a recent World Bank study estimated the gains resulting from a transition to a green economy at over two global GDP points. I welcome our two countries’ efforts to ensure that Europe rises to the climate and environmental challenge. The investments are there: in Sweden, where the government adopted a new strategy for environmental technology in 2011; and in France, with the validation, last July, of thirty-four plans for our industries.

Antoine de Saint-Exupéry, although better known for his prose poetry than for his economic analyses, wrote something very true: “We do not inherit the Earth from our parents, we borrow it from our children”. Prosperity cannot afford to be hindered by a hefty debt, especially a climate and environmental one that risks being irreversible and against which the IPCC has warned us. Let us turn the climate into an opportunity for our economic growth. ■

Source: *La lettre*, no. 39, March 2015



## PROGRAMME

### WELCOME

Serge Haroche

Administrator of the Collège de France

### OPENING ADDRESS

François Hollande

President of the French Republic

His Majesty the King Carl XVI of Sweden

### FIRST ROUND TABLE

#### HOW TO RECONCILE THE CLIMATE AND PROSPERITY?

Moderator

Johan Kuylenstierna

Director of the Stockholm Environment Institute (SEI)

Session Chair

Ségolène Royal

French Minister of Ecology, Sustainable Development and Energy

Maria van der Hoeven

Executive Director of the International Energy Agency (IEA)

Jean Jouzel

Vice-Chair of Working Group I of the Intergovernmental Panel on Climate Change (IPCC)

### SECOND ROUND TABLE

#### STAKEHOLDERS IN ACTION

Moderator

Teresa Ribera

Director of the Institute for Sustainable Development and International Relations

Session Chair

Ibrahim Baylan

Swedish Minister for Energy

Karin Wanngård

Mayor of Stockholm

Marie-Christine Coisne

Chief Executive Officer at Sonepar

Leif Johansson

Chairman of Ericsson and AstraZeneca

### KEYNOTE SPEECH

#### TOWARDS A NEW INTERNATIONAL AGREEMENT

Laurence Tubiana

French Ambassador for Climate Change and Special Representative of the French Minister of Foreign Affairs for the COP21

## INSERM GRAND PRIZE 2013

# Prof. Stanislas Dehaene

## INSERM Grand Prize

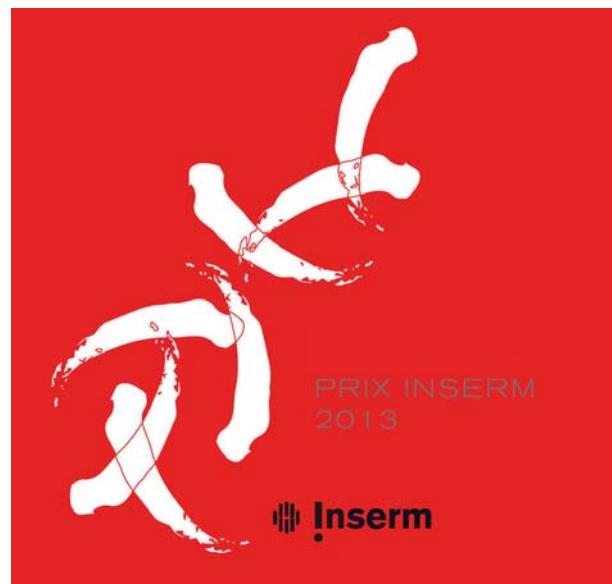
**“I feel particularly fortunate to receive this INSERM award today, for my entire career as a researcher has taken place in this institution (with vital additional support from CEA and, for the last eight years, the Collège de France).**

Nearly a quarter of a century ago, Inserm hired me as a junior researcher. I had just turned 24 and completed my PhD, but had not yet done a post-doc, which would be inconceivable today. I am deeply grateful to the researchers who put their trust in me so early on, especially Jean-Pierre Changeux and Jacques Mehler, who supervised my PhD at the interface of the neurosciences and cognitive psychology.

In 1996, I joined the Frédéric Joliot hospital service of the CEA to set up an Inserm team dedicated to the cerebral mechanisms of human cognitive functions. Thanks to brain imaging techniques, combined with cognitive psychology methods, we were entirely free to explore the most audacious ideas. Thus for the first time, Lionel Naccache and I attempted to measure the cerebral traces of invisible stimuli. Together, we demonstrated the neurophysiological reality of subliminal images. This was the first measurement of unconscious cerebral activity: invisible numbers went through the visual system, activated the sense of quantity in the parietal region, and even biased decisions in the motor cortex – all without consciousness.

Spurred by this discovery, I then launched a research programme to compare the brain activity triggered by minimally different conscious and unconscious images. We discovered that consciousness of sensory information goes hand in hand with an intense activation of the prefrontal cortex and of its cerebral networks. Consciousness appears as a state of global communication in the brain: when a piece of information reaches a certain level of representation, long-distance connections make it available to the whole cortex. What we call “consciousness” is perhaps nothing more than the availability of a piece of information in this global neuronal workspace.

Today, thanks to MRI, EEG, magneto-encephalography, and thanks to the creation of the NeuroSpin centre, which owes much to the vision of Profs André Syrota and Denis Lebihan,



this quest for the “cerebral signatures of consciousness” is evolving very fast, driven by international competition. It is currently leading to clinical applications: with Jean-Rémi King and Jacobo Sitt, at the laboratory, we have just invented a mathematical measurement which, applied to EEG, is able to detect whether brain-lesioned patients in a vegetative state have a high probability of being conscious or of recovering consciousness in the next few weeks.

I am not forgetting the Collège de France, which elected me as a professor in 2005 under the leadership of Jacques Glowinski, then Pierre Corvol, and now Serge Haroche. The impressive and intimidating Collège de France, through which whoever joins it grows – since it requires us to create a new lecture series every year, a vast synthesis of research in the making, available as a reference for everyone to follow online for years to come. Fortunate as they are in its premises, surrounded by a team of the highest level, professors cannot but feel inspired to give the best of themselves.

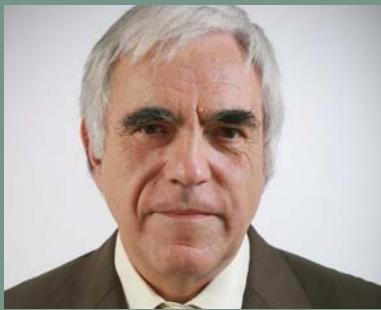
Finally, my thoughts go to all the members of my laboratory, the Cognitive Neuroimaging Unit of the Inserm, the CEA and the Paris-Sud University, which I have headed for almost twelve years. Everyone knows that no research is carried out alone. This is even less so for brain imaging, which requires an arsenal of physicists, informaticians, mathematicians, psychologists, doctors, nurses, secretaries, etc. There are over fifty of us in the unit, and it is a real responsibility, but above all a constant joy, to explore, play, and create new science together. More than ever, I am aware of the extraordinary opportunity that we have of carrying out this research on the human brain during these key decades where everything is opening up, to the point where the skull has almost become transparent. I would like to thank the entire team that has been working with me for so long. There are too many people to be able to name them here, but I dedicate this Inserm Grand Prize to them.” ■

**Prof. Stanislas Dehaene / Excerpts from the speech delivered on 2 December 2013 at the Collège de France**

Source: *La lettre*, no. 38, June 2014



**Prof. Stanislas DEHAENE**  
Experimental  
Cognitive Psychology



## Gérard Berry Laureate of the CNRS Gold Medal

Gérard Berry, Algorithms, Machines and Languages, has won the most prestigious French scientific award: the CNRS Gold Medal.

► The next issue of the *La Lettre du Collège de France* (no. 40) will publish excerpts from the speech that Prof. Berry delivered at the awards ceremony for this distinction. Several Collège de France professors have received the CNRS Gold Medal in the last ten years: Alain Connes in 2004, Serge Haroche in 2009 and Philippe Descola in 2012.



## Alain Fischer 2015 Japan Prize Laureate

Medical Science and Medicinal Science

The Japan Prize is awarded by the Japan Prize Foundation. Since its inception in 1985, the Foundation has awarded the Prize to eighty-one persons from thirteen countries. The Japan Prize Foundation wished to reward Alain Fischer,

Director of the Institute *Imagine*, Chair of Experimental Medicine at the Collège de France, for his pioneering work on gene therapy. Prof. Fischer has demonstrated the therapeutic power of this therapy on X-linked severe combined immunodeficiency.

In 2000, Profs Alain Fischer, Marina Cavazzana and Salima Hacein-Bey carried out and published the world's first test on gene therapy for this disease. The retroviral vector used for this first test has since been modified successfully to prevent any side effects. Prof. Fischer commented that "gene therapy is an extra weapon in the arsenal of therapeutic strategies for enhancing the treatment of genetic diseases and probably other pathologies as well".

More information is available at: [http://www.japanprize.jp/en/prize\\_past\\_2015\\_prize02.html](http://www.japanprize.jp/en/prize_past_2015_prize02.html)



## Clément Sanchez Eni Award

Clément Sanchez, Chair of Chemistry of Hybrid Materials, received the prestigious Eni Award 2014, in the "Environmental protection" section. The chemistry of hybrid materials consists for example in endowing a simple piece of transparent glass with the flexibility and the bright colour of a flower petal to create a material with high-performance mechanical and optical properties. And it is only our imagination that limits the realm of possibilities (in information technology, medicine, energy, cosmetics, construction, transport, etc.). In the environmental field, for instance, we can develop photovoltaic cells on hard or flexible substrates, sensors able to detect toxic materials, photocatalysts to depollute a liquid, absorbers to capture CO<sub>2</sub>, catalysts to turn heavy hydrocarbons into petrol using minimal energy, and so on.



## Ian Hacking Balzan Prize

Emeritus Prof. Ian Hacking, Chair of Philosophy and History of Scientific Concepts from 2001 to 2006, won the 2014 Balzan Prize for his fundamental contributions to the philosophy and history of the natural and social sciences, for the broad range of themes studied in his research, and for his original epistemological perspective centred on a version of scientific

realism, and which departs from the dominant paradigm in the philosophy of science from the last century. Ian Hacking is one of the most important contemporary philosophers of the natural and social sciences. His work consists in a reconstruction and genealogical interpretation of major scientific theories and concepts. His research seeks to highlight the cultural, social, institutional, cognitive, and practical circumstances in which we can identify the historical appearance or emergence of ways of seeing, of styles of reasoning, and of theories about ourselves and the world that provide contemporary models of understanding in the framework of scientific knowledge.

*Source: La lettre, no. 39, March 2015*

**The 27th International Congress of Mathematicians was held in Seoul from 13 to 21 August 2014. This event, which has taken place every four years since the inaugural congress in Zurich in 1897 (with interruptions due to the two World Wars), brought together over 5,000 participants and is the most important one in the field of mathematical sciences.**

# The 2014 Fields Medals

At the Paris Congress in 1900, David Hilbert proposed a list of 23 problems that were to have a profound influence on the development of mathematics in the twentieth century. The 28th International Congress of Mathematicians will be held in Rio de Janeiro in August 2018. Since the Oslo Congress in 1936, the International Congress of Mathematicians has been the occasion on which the International Mathematical Union awards the Fields Medals: between two and four at each Congress. This distinction, which rewards the work of mathematicians under the age of 40, is considered as the most prestigious one in mathematics. The laureates this year were Manjul Bhargava, Martin Hairer, Maryam Mirzakhani and Artur Avila.

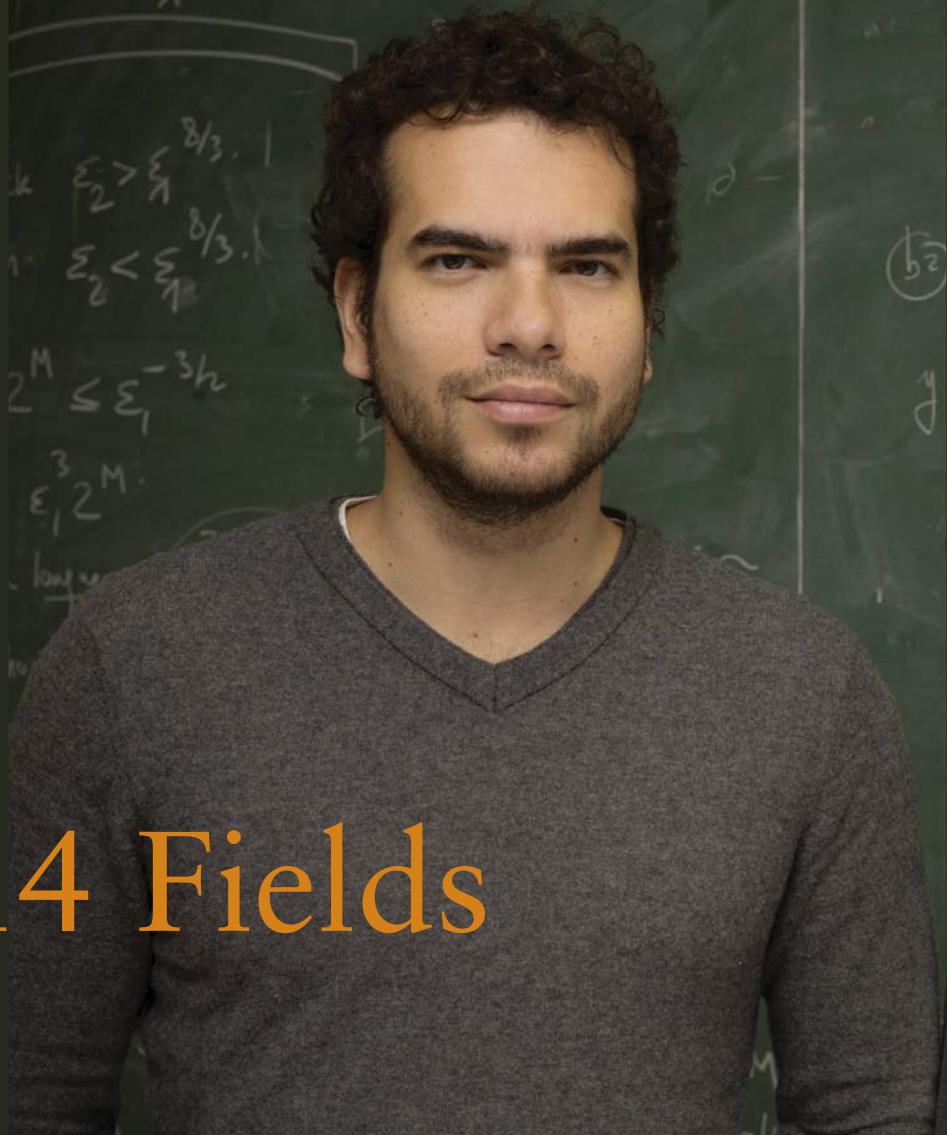
Manjul Bhargava, born in Canada into a family from Rajasthan, is a professor at Princeton University, where he obtained his PhD under Andrew Wiles's supervision. In his work, which focuses on number theory, he has obtained remarkable results on the average rank of elliptic curves. Martin Hairer is an Austrian national. He studies mathematical physics problems in which randomness plays a major role, modelled by stochastic partial differential equations. After obtaining a PhD from the University of Geneva under the supervision of Jean-Pierre Eckmann, and a brief stay at

the Courant Institute in New York, he is now professor at the University of Warwick. Maryam Mirzakhani, from Iran, was the first woman to receive the Fields Medal. She obtained a PhD from Harvard University under Curt McMullen's supervision, and is now a professor at Stanford University. Her research is mainly on the geometry and dynamics of the moduli spaces of complex algebraic curves and of quadratic or Abelian differentials.

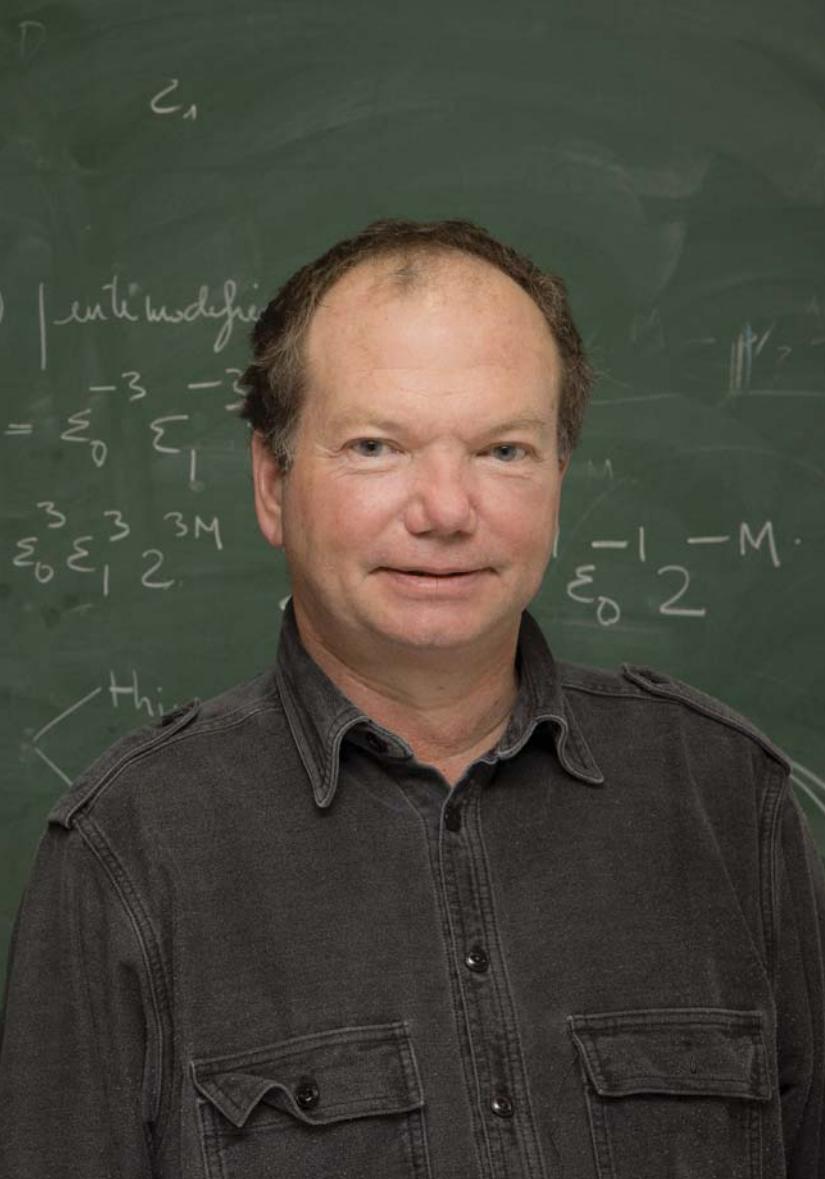
## Artur Avila

Given his ties with the Collège de France, I will devote more attention to Artur Avila. He was born in Rio de Janeiro in 1979. In 1995 (alongside Maryam Mirzakhani) he won a gold medal at the International Mathematical Olympiad.

He obtained his PhD in 2001, at the Instituto Nacional de Matemática Pura e Aplicada (IMPA) in Rio de Janeiro, under Welington de Melo's supervision. From 2001 to 2003, he did a post-doc at the Collège de France as an associate lecturer in my Chair of Differential Equations and Dynamic Systems. He entered the CNRS as a researcher in 2003, and became a senior researcher there in 2008. In 2005 he delivered the Peccot lecture series at the Collège de France and won numerous international distinctions before receiving the Fields Medal, including the Salem Prize in 2005, a prize from the European Mathematical Society in 2008, the Herbrand Prize of the French Academy of Sciences in 2009, and the Michael Brin Prize in 2011.



**Prof. Jean-Christophe Yoccoz**  
Differential Equations  
and Dynamical Systems



Artur Avila and Prof Jean-Christophe Yoccoz

Artur Avila splits his time between France, having recently acquired French citizenship, and Brazil, as the IMPA has been a CNRS international joint research unit since 2006.

Most of Artur Avila's work fits within the framework of the theory of dynamical systems. This discipline, founded by Henri Poincaré at the end of the nineteenth century, focuses on understanding the long-term behaviour of systems with a known short-term evolution. The applied conceptual tools depend on the degree of predictability of the dynamical systems considered. For highly predictable systems, so-called renormalization methods have proven highly powerful. They consist in carrying out a series of spatial and temporal scale changes on the systems considered. The succession of these changes defines a new evolution, whose properties reveal those of the initial system. Artur Avila and his colleagues have contributed significantly to our understanding of the dynamics of these renormalization transformations.

For systems with a more chaotic nature, Lyapunov exponents provide a quantitative measurement of the rate of information loss caused by the evolution. Much of Artur Avila's work is devoted to the crucial question of whether or not these exponents are null. ■

**Prof. Jean-Christophe YOCOZ**

Source: *La lettre*, no. 39, March 2015

## Fields Medals at the Collège de France

Four professors of the Collège de France have won the Fields Medal

### Jean-Pierre Serre

Algebra and Geometry

**Fields Medal 1954**

### Alain Connes

Analysis and Geometry

**Fields Medal 1982**

### Pierre-Louis Lions

Partial Differential Equations and Applications

**Fields Medal 1994**

### Jean-Christophe Yoccoz

Fields Medal 1994

**Differential Equations and Dynamical Systems**

## A Collège de France Visiting Professor Chair in Rio de Janeiro

Relations between the Collège de France and Brazil are longstanding and are a continuation of the contact established by Claude Lévi-Strauss in the 1930s, mainly at the University of São Paulo, where a first Visiting Professor Chair was created in 1998, which is now known as the "Lévi-Strauss Chair". The Rio de Janeiro Chair is a more recent initiative dating back to 2009, the Year of France in Brazil, during which ten Collège de France professors took part in scientific events. The two institutions chose to place it under the auspices of Claude Bernard, Experimental Medicine (1855-1878).

On the French side, Profs Jean-Christophe Yoccoz and Roger Chartier coordinate the exchange.

On the Brazilian side, several people are involved, particularly Prof. Nelson Maculan, an informatician, Prof. Luiz Davidovich, a physicist and member of the Collège de France International Scientific and Strategic Committee (Comité International d'Orientation Scientifique et Stratégique, COSS), and Academician Jacob Palis, current president of the Brazilian Academy of Sciences and former member of the COSS.

On 17 November 2014 the convention was renewed until 2019, at a ceremony where Prof. Pierre Rosanvallon represented the Collège de France.

# The Many Faces of Ling Gesar

## A Tribute to Rolf A. Stein

Rolf Alfred Stein (1911-1999) was born in Germany, but fled to France in 1933, where he continued his education in Asian Studies under the leading orientalists of the time, notably Marcel Granet and Henri Maspéro in Sinology, Paul Pelliot in Mongolian and Central Asian Studies, and Jacques Bacot and Marcelle Lalou in Tibetan Studies. His remarkable versatility allowed him to devote his talents to work in such diverse areas as the Taoist religion of China and the Bön traditions of Tibet, the philological and historical analysis of the Dunhuang manuscripts in both Chinese and Tibetan, the religious significance of miniaturization in East Asian civilizations, the ethnohistory of the Sino-Tibetan marches, and much more besides. In Tibetan Studies in particular, his *Tibetan Civilization* [1962] is regarded as a fundamental synthesis, while his two major contributions to research on the epic of Ling Gesar (*L'Épopée tibétaine de Gesar dans sa version lamaique de Ling* in 1956 and *Recherches sur l'épopée et le bardé au Tibet* in 1959) are among the cornerstones of the field. His sustained interest in topics involving the interrelationships of religion, literature and popular culture is also manifest in his work *Vie et chants de 'Brug-pa Kun-legs, le yogin* (1972). Rolf Alfred Stein was professor of Chinese and Tibetan religions at the École Pratique des Hautes Études (EPHE) from 1951 to 1970, as well as professor at the Collège de France from 1966 until his retirement in 1981.

Although a considerable part of Prof. Stein's career was devoted to the study of the Tibetan epic of the hero Gesar, research on this subject has progressed little within the half century following the publication of his major contributions. In recognition of this, the international symposium, *The Many Faces of Ling Gesar*, was organized to honour his memory and at the same time to renew a field of which he was particularly fond. In the spirit of Prof. Stein's work, we spent two days exploring the variety of the traditions linked to Gesar as they have developed in the regions of Eastern Tibet, Mongolia, and in parts of Indian and Pakistani Kashmir.

John Scheid, Collège de France professor and Vice-Administrator, and Hubert Bost, president of the École Pratique des Hautes Études, kindly agreed to open the symposium. Two of Prof. Stein's best-known students also delivered talks on the occasion: Anne-Marie Blondeau outlined Stein's career, with a special focus on his research on the Gesar epic, while Mireille Helffer spoke on the

current efforts to preserve the first recordings of bardic recitations of Gesar preserved in French collections, some of which were made by Prof. Stein himself.

The contributors to the symposium included four eminent representatives of current research on the Gesar epic in China: Yang Enhong and Norbu Wangdan, from the Chinese Academy of Social Sciences in Beijing, Chopak Dondrup, professor emeritus at Qinghai Nationalities University, and Wang Guoming of the Northwest University for Nationalities, in Lanzhou, Gansu. Mr Wang, son of the last Gesar bard among the Monguor people of Qinghai, punctuated his presentation with the improvised recitation of a few passages from the epic, sung in his father's tradition. Donagh Coleman's documentary film *A Gesar Bard's Tale*, portraying a Tibetan bard in Qinghai province, precisely complemented the contributions of the Chinese specialists. The versions of the epic preserved in Western Tibetan cultural regions were examined in the presentations of Siddiq Wahid, from the University of Kashmir, and Estelle Dryland, from Macquarie University (Australia). Mr Wahid also presented *The Kesar Saga*, a poetic documentary filmed in Ladakh by the Kashmiri director Iffat Fatima. Other participants who spoke on the literary, ritual and historic dimensions of the epic included George FitzHerbert (Oxford), Gregory Forques (Vienna), Frances Garrett (Toronto), Frantz Grenet (Collège de France), Lama Jabb (Oxford), Matthew King (Riverside, California) and Geoffrey Samuel (Cardiff). ■

**Matthew Kapstein/Charles Ramble**  
Source: *La lettre*, no. 39, March 2015

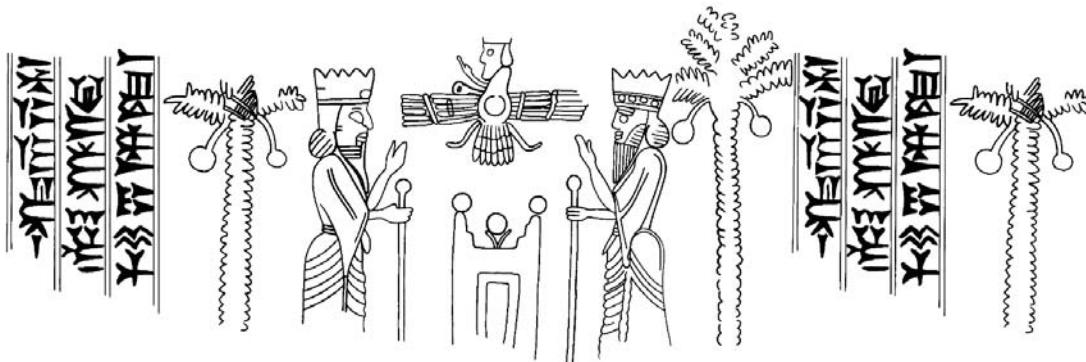
The symposium was organized by Matthew T. Kapstein (EPHE), Charles Ramble (EPHE) and Prof. Jean-Noël Robert (Collège de France), with the support of the East Asian Civilizations Research Centre (CRAAO, CNRS), the EPHE, and the Hugot Foundation of the Collège de France.



An image of Gesar taking the form known as "Gesar Norbu Dradul". This 18th century scroll painting, attributed to the artist Hor Namka Gyan from Kangdze, in Eastern Tibet, may be the earliest known Gesar composition  
© Himalayan Art Resources Inc.

## INDO-IRANIAN LANGUAGES AND RELIGIONS

### SYMPORIUM 7-8 NOVEMBER 2013



# The Achaemenid Religion

## Comparing sources

**In autumn 2013, the Chair of Indo-Iranian Languages and Religions organized a symposium on the Achaemenid religion, in collaboration with Pierre Briant and Wouter Henkelman.**

This subject was widely debated in the 1970s, yet it is worth reconsidering, in view of recent advances in both the content and the understanding of the available material. We have only two ancient Iranian corpuses: the Achaemenid documents (including the royal inscriptions in Old Persian, the Elamite tablets and the Greek authors' accounts), and the Avesta. The Achaemenids came to power in 521-522 BCE; however the Avestan corpus, which corresponds only to a liturgical recitative, yields no historical knowledge. We also know only that the latter was composed in eastern Iran before being disseminated at an unknown date. Although these are two very different kinds of corpus, obvious parallels can be drawn regarding their content, such as the name of the supreme god Ahura Mazdā (op. *auramazdā*, av. *ahura mazdā*), for example, or the condemning of demons (op. *daiva*, av. *daēuuua* "demon" against *deva* "god"). These facts call for an examination of the question as to the relationship between the Achaemenids and the Avesta, particularly in light of the renewed representation of the Avesta, and of recent advances in the understanding of Elamite material. Studying the Achaemenid religion consequently requires an understanding of the diversity of the abovementioned sources, through an interdisciplinary approach articulating Assyriology, Elamology, Iranology, archaeology and iconography. This symposium was therefore dedicated to comparing both sources and disciplines, as shown in the programme. The presentations were followed by particularly enriching scientific discussions, which further developed the researchers' reflection whilst highlighting the fact that new questions are emerging and research has to be undertaken if we are to be able to answer them. ■

**Céline REDARD**

Source: *La lettre*, no. 38, June 2014

**Prof. Jean KELLENS**

Indo-Iranian

Languages and Religions (1993-2014)

### Programme

Beyond Auramazda and the Winged Symbol:  
Imagery of the Divine and the Numinous at Persepolis  
Mark Garrison, *Trinity University, Texas*

The Iconographic Convergence between God  
and the King in Achaemenid Art  
Bruno Jacobs, *Basel University, Switzerland*

State Cult and Royal Ideology of the Neo-Assyrian Empire  
as a Structuring Model for Achaemenid Imperial Religion  
Salvatore Gaspa, *Copenhagen University, Denmark*

The Royal Babylonian Culture during the Achaemenid Era  
Gauthier Tolini, *ArScAn-HAROC*

Considerations on the Avesta and the Achaemenids  
Alberto Cantera, *Salamanca University, Spain*

The Achaemenids between Avestan Texts and Liturgy  
Jean Kellens, *Collège de France*

Of Gods and Men in the Persepolis Bronze Plaque  
Gian Pietro Basello, *Naples Eastern University, Italy*

Hurban and Auramazda: Royal Gods in a Persian Landscape  
Wouter Henkelman, *EPHE / Deutsches Archäologisches Institut, Berlin*

"How Median were the Medes"?  
Status of a long Debated Question  
Adriano V. Rossi, *Naples Eastern University, Italy*

Religious Aspects in the Aramaic Texts from Bactria  
Jan Tavernier, *Leuven Catholic University, Belgium*

Reflections on the Elusive Archaeological Evidence  
of the Religion of the Achaemenids  
Pierfrancesco Callieri, *Bologna University, Italy*

Sogdian Sanctuaries of the Achaemenid Era  
(Koktepe and Sangir-tepe)  
Claude Rapin, *ENS/CNRS*

The Persian Mazdeism and the Origin of the Avesta  
Antonio Panaino, *Bologna University, Italy*

Languages, Peoples, Religions, and Sources: Problems of Identity  
and Tradition in Achaemenid Zoroastrianism  
Albert de Jong, *Leiden University, The Netherlands*

Historiographic Conclusion  
Clarisse Herrenschmidt, *CNRS/Collège de France*

Image : PFS 11\*: with authorization from the Persepolis Seal Project Céline Redard

- Videos of the symposium are available at [www.college-de-france.fr](http://www.college-de-france.fr), on Prof. Jean Kellens's page.
- The papers will be published in Prof. Pierre Briant's collection "Persika"/Collège de France.





Alesia, Temple of Apollo Moritasgus © Olivier de Cazanove

**Alongside the publications of the temples of La Magliana (Rome) and Djebel Oust (Tunisia), and the project of compiling the corpus of Ancient Italy's places of worship (entitled *Fana Tempa Delubra*), John Scheid regularly organizes seminars dedicated to the new findings of recent excavations that have not yet been published.**

The emphasis is primarily put on new information concerning rites observed in the field. Whereas last year the seminar discussed places of worship in Italy, this year it focused mainly on France, apart from two papers which discussed the example of Brescia (Filomena Rossi presented the spectacular evolution of a place of worship, from the sixth century until it became a Capitol; and Serena Solano retraced contemporary development of the Sanctuary of Minerva in Breno, towards the borders of Brescia).

Some presentations concerned extraordinary discoveries: Gabriel Rocque described the successive stages of the major place of worship in Magny-Cours (Allier) and presented questions posed by its functioning, while Didier Rigal described the launch of archaeological explorations in the city of Cahors. Other presentations examined new developments on already known sites. Stéphane Sindonino thus reflected on the new Temple 4 of Argentogamus (Indre), which raises comprehension issues, and Sandrine Bertaudière presented the new material found on the large Vieil-Evreux site (Eure), especially interesting ritual deposits. Pascal Vipart described an original case, that of the development of a worship district in Nasium/Forum Leucorum (Meuse), the first capital of the Leuques, and then its dissembling when the city-capital was transferred to Toul.

The last two examples discussed were the old excavations of Grand (Vosges) and Alésia (Côte d'Or). Thierry Dechezleprêtre described the stages of the identification and inventory work and of the new excavations carried out at Grand, where archaeologists are still trying to determine whether or not the town hosted the large temple of Apollo they once dreamed about. At Alésia, they are also resuming and completing old

## RELIGION, INSTITUTIONS AND SOCIETY OF ANCIENT ROME SYMPOSIUM 24 JANUARY 2014

# Temples in Gaul and Italy

## New excavations and discoveries

excavations around the temple of Apollo Moritasgus. Olivier de Cazanove, who has been leading these excavations for the last few years, presented their latest findings. All these examples raised questions on the value of previous arguments and hypotheses, and provided information on exploration strategies for the next few years. The seminar was attended by a large audience, which actively took part in the discussion on these generally spectacular excavations. ■

**Prof. John SCHEID**

*Source: La lettre, no. 38, June 2014*

### Programme

#### Introduction

John Scheid, Collège de France

Luoghi di culto e processi di romanizzazione: due esempi in Cisalpina (Places of Worship and the Process of Romanization: Two Examples in Cisalpina)

Filomena Rossi and Serena Solano, Lombardy Superintendence of Cultural Heritage

#### First Results of the Magny-Cours Excavation

Gabriel Rocque, Preventive Archaeology Service of the Département de l'Allier

Places of Worship in Cahors-Divona, Recent Discoveries and State of the Art

Didier Rigal, INRAP

New Data on Places of Worship in Argentomagus: Temple 4

Stéphane Sindonino, INRAP

#### New Discoveries in Vieil Evreux

Laurent Guyard, Département du Lot, and Sandrine Bertaudière, Site and Programmed Excavation Manager, MADE (Mission archéologique départementale de l'Eure)

The Worship District in Nasium/Forum Leucorum (Naix-aux-Forges and Saint-Amand-sur-Ornain, Meuse), First City-Capital of the Leuci.

Pascal Vipart, University of Nancy

#### The Grand Site after Recent Work

Thierry Dechezleprêtre, Conseil général des Vosges, UMR 8546 CNRS/ENS

#### New Elements on the Temple of Apollo Moritasgus

Olivier de Cazanove, University Paris 1

**Prof. John SCHEID**

Religion, Institutions  
and Society of Ancient Rome



METAPHYSICS  
AND PHILOSOPHY OF KNOWLEDGE  
SYMPOSIUM 5-6 DECEMBER 2013

# The Philosophy of Causation

**Prof. Claudine Tiercelin's seminar took the form of a symposium on causation, which was held on 5 and 6 December 2013. This international symposium in English, titled "Causation: New Prospects", bore witness to the rapid growth of the philosophy of causation.**

Since the early 1970s, this expansion has largely been informed by the significant revival of metaphysics, which has gone hand in hand with the extension of the metaphysics of the laws of nature, of modality, of probability and of properties. One of the noteworthy characteristics of the current philosophical period, which the symposium highlighted, is the entanglement of the most promising developments in these various fields – and in the philosophy of causation in particular. By contrast, the preceding period was characterized by hyper-specialized research.

It seems that the full importance of the rapid growth of the philosophy of causation is not always seen favourably in France. Instead, we cling to the idea that the philosophy of causation can be more or less summed up by the following two approaches. This first amounts to pointing out the Humian critique of the idea of causal connection, and to considering this critique as definitive (albeit relatively superficial). The second consists in reviewing Kant's criticist view, which sees the movement inaugurated by Hume as fully developed and rendered philosophically profound; in arguing that twentieth-century science established the intrinsic indeterminacy of the ultimate nature of reality; and finally in claiming that, between this supposed lesson of science in the past century and a position such as Kant's (that we



*Movements of the air as it encounters a sloping curved surface*, chronophotograph on a fixed plate, Étienne-Jules Marey, 1901, Collège de France Archives

hardly conceive of impugning), a relationship exists such that the latter is validated (rather than challenged) by the former.

Yet other, particularly compelling questions were addressed during these two days. First, what is the metaphysical nature of the connection between a cause C and its effect E? Is it a statistical correlation, a physical process, a relationship of counterfactual dependence, or a nomological subsumption? And then, of what does the metaphysical nature of causal relata consist? Are we looking at facts, events, objects, and properties? Can absences, omissions and non-occurrences be considered as real causes?

Another fundamental aim of the philosophy of causation is to determine the criteria used to identify a cause, and to distinguish it from the mere conditions determining the realization of a certain effect. Can we argue that a cause suffices to produce its effect, while a condition of the effect is simply *necessary* for its occurrence? Does the notion of causal connection encompass that of the necessitation of an effect? The problem is particularly acute in the case of an undetermined occurrence of the effect, in so far as it would not have the sufficient conditions. Would it for all that be devoid

# METAPHYSICS AND PHILOSOPHY OF KNOWLEDGE

## SYMPOSIUM 5-6 DECEMBER 2013

of a cause? Is a probabilistic approach defendable? Does the problem of “pre-emption” not preclude it?

Causation is also involved in science and philosophy for the purpose of explanation. Does giving a causal explanation amount to identifying a cause or not? Or could an effect be explained causally without such an event being held to be its real cause? Does our concept of causation encompass two fundamentally distinct ideas: that of a relationship of counterfactual dependence; and that of a physical or mechanistic production? And must there be temporal priority of the cause on the effect?

At the symposium, Huw Price (Trinity College, University of Cambridge) applied his skills in the philosophy of time to the elucidation of quantum causation. A discussion was then held between the leading specialists of the metaphysics of causation, Laurie A. Paul (University of North Carolina), Helen Beebee (University of Manchester), Sarah Bernstein (Duke University), Christopher Hitchcock (California Institute of Technology), Michael Strevens (New York University), Paul Noordhof (University of York) and Brad Weslake (University of Rochester). Thomas Pradeu (Paris-Sorbonne University) explored the concept of causation in biology, Stephen Mumford (University of Nottingham) and Claudine Tiercelin defended two conceptions of a dispositionalist approach to causes, and James Woodward (University of Pittsburgh), the founder of the interventionist theory of causation, responded to objections formulated against his historical model.

Whether the idea of causation is, or not, as Russell wrote “a relic of a bygone age, surviving, like the [British] monarchy, only because it is erroneously supposed to do no harm”, the symposium brought to light the fact that one first has to be able to answer the type of question mentioned above, for this type of verdict to be made, and that the core of philosophical work on causation lies in the precise treatment of these questions. ■

**Jean-Marie CHEVALIER/Benoit GAULTIER/  
Prof. Claudine TIERCELIN**

Source: *La lettre*, no. 38, June 2014

### Programme

#### Introduction

Claudine Tiercelin, *Collège de France*

#### Causation in the Quantum World – A New Case for the Paris Option?

Huw Price, *Trinity College, University of Cambridge*

#### Experience, Causal Productivity and the Temporal Arrow

Laurie A. Paul, *University of North Carolina, Chapel Hill*

#### Possible Causation

Sara Bernstein, *Duke University*

#### Causal Reality: One Thing, Two Aspects

Michael Strevens, *New York University*

#### Understanding Causation by Way of Failure

Stephen Mumford, *University of Nottingham*

#### Causal Powers, Causal Relations and Causal Explanation

Claudine Tiercelin, *Collège de France*

#### Discussion

Claudine Tiercelin, *Collège de France*

#### Development, Information and Causation

Thomas Pradeu, *Paris-Sorbonne University*

#### Difference-Making and Causal Exclusion: Is there Still a Problem?

Helen Beebee, *University of Manchester*

#### Causation: New Arguments for the Counterfactual Theory of Causation

Paul Noordhof, *University of York*

#### Why Think Causally?

Brad Weslake, *University of Rochester*

#### Actual Causation, Causal Paths, and Plans

Christopher Hitchcock, *California Institute of Technology*

#### Interventionism Defended: Methodology, Circularity, and Truth Conditions

James Woodward, *University of Pittsburgh*

#### General Discussion

Claudine Tiercelin, *Collège de France*



Videos of the symposium are available  
at [www.college-de-france.fr](http://www.college-de-france.fr), on the professor's page.

**Prof. Claudine TIERCELIN**

Metaphysics  
and Philosophy of Knowledge



# Between Gods and Humans: Angels, demons and others

**The interdisciplinary symposium “Between Gods and Humans: Angels, Demons and Others” was held on 19 and 20 May 2014, within the framework of the Chair of the Hebrew Bible and its Contexts’ seminar.**

This symposium was an opportunity once again to bring together Biblicalists, Assyriologists, Egyptologists, Hellenists, an Iranologist, and a Medievalist, who were invited by Prof. Römer to examine the question of the intermediaries that inhabit the spaces between gods and human beings. In many religions and philosophical systems, the question of humans' place and their relationship with gods or higher powers plays an important role. Many myths and other texts reflect on what distinguishes humans from gods. But at the same time, there is also the idea that between gods and humans there exists a host of intermediary or hybrid beings, which shows that the boundaries between them are not impermeable. Such beings can also play roles that believers are loathe to attribute to their gods, or act as mediators with gods that are too occupied or distant to have a direct relationship with humans.

## Human or divine?

The “in-between world” is populated with figures in Mesopotamian, Judeo-Christian, Greek and many other cultures. Some are human, others are “supernatural”, and yet others replace gods. These figures are not always intermediaries to begin with, but subsequently become so without always remaining that way. Historically, certain figures acquire this status and then lose it. Thus at the time of the monarchy in Israel (the Iron Age), deceased ancestors were likely invoked as spirits, which could be attested to by the presence of naked femi-



Astaroth, illustration by Louis Breton

nine figures in tombs, who were perhaps in some instances the sign of an appeal for healing sterility. This conception of the intermediate ancestor would subsequently have disappeared, with the rise of the conception of a more neutral *sheol*, where the dead no longer played this intermediary part. Such fluctuation is also found across cultures distinguished by the role intermediaries play in them. The hero, for instance, is clearly considered to be a demi-god in *The Iliad*, while his Hebrew counterpart seems more earthly. In the ancient Mazdaism of the Avesta, the situation is again different, since there are multiple subordinate gods who are however not really intermediaries between a deity and humans.

## A reflection of the earthly king's court

The intermediary being is often highly ambiguous. Several papers of the symposium addressed the question as to the nature of the intermediary beings that inhabit the Assyrian world. Are they genii or agents of evil? The Assyrian nomenclature is ambiguous and the “demon” (*udug=utukku*) should be defined as a neutral entity rather than understood through our categories of “good” or “bad”. Generally speaking, this symposium has therefore shown the extent to which the boundaries between “demons” and “angels” are permeable. We need to remember that even in the Judeo-Christian tradition, the devil originally belonged to the divine council (Job 1-2; Zacharia 3), before becoming an entity opposed to God. It is highly likely that the figure of the devil was inspired by the messengers and accusers who worked in the Persian court for their king (sixth to fifth centuries BCE). The human origin of the king's court that motivated the description of the divine world's “angels” and “demons” is equally found in the Judeo-Christian and Mesopotamian worlds. Thus, the intercession formulas used for Mesopotamian kings (Royal Archives of Mari 10 156: 4-33)

or their wives became copies of the intercession formulas used in religions to address the “supernatural” world.

## A reflection of history

But where do these intermediary beings come from? Often, the demons come from the outside, as in the case of Lamaštu, and convey a historical concern. Lamaštu is described as an Amorite woman in ancient Babylonian texts (tablet of the Yale Babylonian Collection 9846, 1-4), when the Amorites posed problems for Babylonian kings, between the third and second centuries BCE. Yet in spite of this rhetoric, other texts show that Lamaštu was very well integrated into the Mesopotamian pantheon and beliefs. It is interesting to see that the latter converge with biblical material, since these figures can easily be imagined living on steppes, in the desert or in ruins, in any case on the fringes of the prevailing culture. The description of the ruins in the Bible (Isaiah 13, 19-22; 34, 9-17; etc.) converges with this concern for imagining the margins of the surrounding world and its dangers. The more its borders are known, the more the demons' language will change. It is interesting to see that the Greek translators of these passages in the Septuagint made mythological animals (sirens, demons, onocentaur, etc.) coexist with natural animals, as the Hellenist cultural horizon was expanding its borders. There was more and more real knowledge of the peripheries, and they attracted new interest. In the Greek language current at the time, the adjective *daimonios* even eventually became a simple synonym of “prodigious”, “marvellous” or “amazing”. Later, the Islam of the Mamluks left even less room for an “in-between world” filled with supernatural entities, as only *rassuls* and the last of the prophets were credited with a real intermediary function.

## Rites

Finally, the question of the management of this threatening or reassuring “in-between world” was addressed. How were these beings warded off or appealed to? The scapegoat appears to be one of the ways of managing this liminal world, as he is sent to the desert (Leviticus 16). Since the “in-between world” serves to explain certain events in history (Lamaštu) while also trying to influence them (intercessions), this place is forever intriguing for humans. Even today, these intermediaries have returned in “popular culture” as spiritual beings of all sorts, as the recent success of books and films on vampires attests. ■

**Fabien PIFFZMANN (ATER)**  
[Temporary Research and Teaching Assistant]

Source: *La lettre*, no. 39, March 2015

- Videos of the symposium are available at [www.college-de-france.fr](http://www.college-de-france.fr), on the professor's page
- Prof. Thomas Römer is the laureate of the History of Religions Prize from the Fondation des Amis de Pierre-Antoine Bernheim for his book *L'invention de Dieu* (Éditions du Seuil, 2014).

## Programme

### Introduction

Thomas Römer, *Collège de France*

**Protective Genii and Agents of Evil in Art and Texts  
(Late III - Early II Millennium BCE)**

Michaël Guichard, *Collège de France, UMR 7192*

**Angels or Demons? Divine Beings Seen through the Eyes  
of Assyrian Wise Men**

Lionel Marti, *Collège de France, UMR 7192*

**Living with Ancestral Spirits in the Iron Age  
and the Persian Period**

Diana Edelman, *Trinity College, Dublin*

**Comparative Imaginary of the Demoniac in Ancient Israelite  
Traditions. The Dwellers in the Ruins in the Book of Isaiah**

Christophe Nihan, *University of Lausanne, UMR 7192*

**Comparative Imaginary of the Demoniac in Ancient Israelite  
Traditions. The Bestiary of Isaiah in the Septuagint**

Anna Angelini, *University of Lausanne*

**Was There an Early Israelite Pandemonium?**

Brian Schmidt, *University of Michigan*

**Intercession in Mesopotamian Society**

Dominique Charpin, *Collège de France, UMR 7192*

**An Interface with the Deity, a Representative of the People  
(Exodus 18,19): Moses' Positions between Yhwh and Israel**

Daniele Garrone, *Waldensian Faculty of Rome*

**The Hero: An Intermediate Figure? Comparative Study  
of Greek Epic and Old Testament Data**

Matthieu Pellet, *University of Lausanne*

**The Angels of Heaven and Elements of the Universe**

Marc Philonenko, *Académie des Inscriptions et Belles-Lettres*

**The Multiple Identities of Metatron in Ancient Judaism:  
Man, Angel, and God**

David Hamidovic, *University of Lausanne*

**Why Bother with the Figure of the Revealing Angel?**

Christoph Uehlinger, *University of Zurich*

**The Personal God of the Amorite King  
and His Subjects' Success**

Jean-Marie Durand, *Collège de France, UMR 7192*

**The King - a Key Figure between God / the Gods and Man**

Hans-Peter Mathys, *University of Basel*

**The Figure of the Prophet's Man-Guide in Ezekiel 40-48**

Dany Nocquet, *Protestant Institute of Theology, Montpellier*

**Mesopotamian Demons - Alien and yet Native Powers?**

Nils Heessel, *Heidelberg University*

**Infernal Bes Gods**

Youri Volokhine, *University of Geneva*

**Paul's Pantheon - an Embarrassment of Riches  
in the Spirit World**

Valérie Nicolet-Anderson, *Protestant Institute of Theology, Paris*

**The Scapegoat - Notes on a Demoniac Figure from  
the Old Testament**

Bernd Janowski, *University of Tübingen*

**Figures of Divine Subordination in Mazdaism**

Jean Kellens, *Collège de France*

**Divine Messages and Intermediaries in a Selection  
of Mamluk Historical Chronicles**

Bernadette Martel-Thoumian, *Université de Grenoble, UMR 7192*

**The Need for the Devil**

Thomas Römer, *Collège de France, UMR 7192*

**Prof. Thomas RÖMER**

The Hebrew Bible  
and its Contexts



ROUND TABLE  
MODERN AND CONTEMPORARY FRENCH  
LITERATURE: HISTORY, CRITICISM, THEORY

# The Collège de France: 1973, 1993, 2013

## A retrospective outlook on Marcel Bluwal's documentaries

**Marcel Bluwal made two documentaries on the Collège de France: the first in 1973 for the ORTF (former French broadcasting corporation), as part of a series of programmes called “Signe des temps”, broadcasted between 1972 and 1974; and the second produced in 1993 for the INA (National Audio-Visual Institute). These films captured professors, the audience, the staff, buildings, and surrounding streets, offering a wealth of information on the major periods of the institution’s history.**

Eight new professors were appointed in 1973, including Jacqueline de Romilly (Greece and the Formation of Moral and Political Thought, 1973-1984), the first woman elected as a professor at the Collège de France. In 1993, a year that saw almost as many transformations as did 1973, renovations were begun on the Collège de France's Marcelin-Berthelot site. The last phase of this overhaul has now been completed, with the inauguration of the Physics Institute and the Chemistry Institute, in the building designed by Guibert Architects in the 1930s.

In 1973, the film director “stormed the Collège”, shooting in lecture theatres, laboratories, the Assembly hall, inner courtyards, and the Administrator's office, occupied at the time by Étienne Wolff (followed by André Miquel in 1993), with whom he discussed the continuity of the Collège de France's traditions. The influence of structuralism was a notable theme of the first

programme, filmed shortly after the 1968 upheaval in the then “run-down” buildings of the Collège de France. Bluwal staged the opposition between “structure” and “history” through a discussion with mathematician André Lichnerowicz, historian Georges Duby and anthropologist Claude Lévi-Strauss, whose Laboratory of Social Anthropology was founded in 1960. This opposition – and the Marxist dialectics that underlies it – summed up the debate that was central to that era, on whether scholars and science were engaged “in the century” or not.

In 1993, the mathematician Alain Connes, who was also interviewed, suggested that the structure/history alternative, a subject of intense intellectual activity in the 1970s – and one that Bluwal had readily emphasized – was no longer so current. Connes jokingly criticized the use of mathematical models in the humanities, particularly by psychoanalyst Jacques Lacan.



From left to right: Profs Antoine Compagnon, Marcel Bluwal, Jacques Glowinski, Pierre Corvol, John Scheid, Claudine Tiercelin and Alain Prochiantz



Prof. Pierre-Gilles de Gennes in Marcel Bluwal's documentary in 1973

The focus, he said, had then shifted to “transdisciplinarity”, the organizing principle of the Collège de France long before it became fashionable when the documentary was made. The 1993 film furthermore involved personalities and distinct approaches to scientific work.

Physicists Claude Cohen-Tannoudji and Pierre-Gilles de Gennes respectively spoke about “pleasure” as the driver of research and the scholars’ public role after the fall of the Berlin Wall. Jean-Marie Lehn discussed how chemists “sculpt” matter, and historian Paul Veyne talked about the professors’ freedom to devote themselves fully to their work. This constituted a defence of fundamental research, which is still just as imperative today as it was in 1993. These two films also manifested a desire to understand what the Collège de France is, as the institution became an object of research in its own right in front of the director’s camera.

Twenty years after the last film, it seemed opportune to organize a new meeting between the Collège de France’s professors and Marcel Bluwal, to discuss still highly topical questions in the framework of the research project on the evolution of disciplines at the Collège de France (“Passage des disciplines”), directed by Antoine Compagnon in collaboration with Céline Surprenant. In 2013, instead of a television programme, a round table facilitated by Antoine Compagnon brought together Marcel Bluwal and Professors Claudine Tiercelin, Pierre Corvol, Jacques Glowinski, John Scheid and Alain Prochiantz. Series of excerpts were screened from the 1993 documentary, which itself included excerpts from the 1973 programme. This was the opportunity to pay tribute to Marcel Bluwal, an attentive observer of the Collège de France and a pioneer of French television who, in addition to the documentaries, filmed many anthological adaptations of novels and plays (see filmography in the box below).

Bluwal opened the debate by explaining his “position of distinguished amateur”, filmed from behind in the interviews with the professors. “I am in a sense a medium”, he said, to “show” that television is a mediate thing, and that “there is no direct contact through the image between a person and the public”. He established himself as a “spectator”, whilst orchestrating the opposition of divergent points of view such as those of the sociologist Pierre Bourdieu and of the historian of literature

Marc Fumaroli, for instance, or concerning the broadcasting of lectures or the broadening of their audience. Marcel Bluwal maintained this role during the round table, by asking professors about the secret of certain renowned Collège de France practices, such as Faculty Meetings in camera, where the selections of disciplines and the election of professors take place. Participants expressed their emotions aroused by old images of the Collège de France, recalled their early days in the institution, and talked about the “difficulty of being at the Collège de France”, as it is made of individualities and a sum of disciplines, which are not always harmonized. Their predecessors’ accounts led the professors to reflect on the “subject of science” and of language, which is present in all scientific discoveries but has tended to be minimized in favour of a mathematical model that long determined the image of science. They argued that scientists’ permeability to “what happens in the world, in society” was, and still is, at stake. The relevance of the opposition between humanities and hard sciences was discussed, with the participants maintaining that the films conveyed an image of these sciences that belonged to the past.

Finally, whether it recalled the recent history of the “Grand Travaux” [François Mitterrand’s Grands Projets which allowed for large-scale building works to be undertaken at the Collège], or highlighted philosophical questions on the practice of science, the round table afforded a new encounter between a film director, who is a researcher through images, and scientists around an object, the Collège de France, whose history still largely remains to be written. ■

**Prof. Antoine COMPAGNON/Céline SURPRENANT**

Source: *La lettre*, no. 38, June 2014

### Marcel Bluwal

Marcel Bluwal, born in Paris in 1925, is an author, director, and most importantly one of French television’s most prolific filmmakers. He has won renown in all genres, particularly through many adaptations of classical literary and dramatic works, including:

- *Le Mariage de Figaro* (1961)
- *Don Juan ou le Festin de Pierre* (1965)
- *Les jeux de l’amour et du hasard* (1967)
- *La Double inconstance* (1968)
- *Les Misérables* (1972)
- *Les Indes Noires* (1964)

He filmed the ORTF’s first series, including *L’Inspecteur Leclerc* (1962), *Vidocq* (1967) and *Les Nouvelles Aventures de Vidocq* (1971).

More recently, in addition to literary work, he has made documentaries: *Les Ritals* (1991), *À droite toute* (2009).

- For more information on these documentaries, see: [www.ina.fr](http://www.ina.fr)
- A video of the round table will soon be available at [www.college-de-france.fr](http://www.college-de-france.fr)

**Prof. Antoine COMPAGNON**  
Modern and Contemporary  
French Literature: History,  
Criticism, Theory



# Democracy in Labour

**From 13 to 20 September 2014, some thirty intellectuals from various disciplines came together at the Centre Culturel International of Cerisy-La-Salle (Manche) to discuss the work of Pierre Rosanvallon, Chair of Modern and Contemporary Politics at the Collège de France since 2001, in his presence. The week of critical debates, which took place in a friendly environment, was marked by a desire to investigate and build on Pierre Rosanvallon's work, and to use it as a starting point for further research.**

This symposium, organized by Sarah Al-Matary (University of Lyon 2) and Florent Guénard (University of Nantes), followed the Decades of Pontigny tradition that was inaugurated in 1910 and directed by Paul Desjardins, when the main focus was on literature. In the 1970s these meetings – hosted in Cerisy from 1952 – were opened up to the humanities and social sciences, for which they became a theoretical crucible. Pierre Rosanvallon, former confederate secretary of the French trade union CFDT (Confédération Française Démocratique du Travail) and author of *L'Âge de l'autogestion* (1976), participated in events held in 1979 and 1981. Thirty years later, his now major intellectual work itself has been the theme of a symposium, which brought together colleagues, students, and interested members of the public in a friendly, though not an indulgent, spirit.

The debates revolved around the question of democracy, which is central to Pierre Rosanvallon's thinking. This main topic was examined through several themes so as to investigate the conceptual structure of his work, whilst resituating it in the author's intellectual and personal trajectory. The debates on the history of democratic modernity and the conceptual history of politics rapidly turned to the contemporary challenges of democracy in France and abroad. Through a systematic discussion of some of the major concepts underpinning Pierre Rosanvallon's work (the distinction between "politics" and "policy", liberalism, equality, "counter-democracy"), and through the lens of their respective research fields, the participants considered the current relevance of reflection essentially built on nineteenth-century French history, whereas the stakes largely exceed it. Thus the discussion involved the French Revolution, the twentieth-century intermediary bodies, the metamorphoses of the principle of responsibility, the social State in France and Scandinavian countries, the



idea of equality in India, counter-democracy in the Arab world today, democracy in Latin America and the reception of Pierre Rosanvallon's work in China.

Alongside reflection on democracy, its history, its complexity or even its theoretical and practical aporias, these days of intellectual debate were a plea for multidisciplinarity. Florent Guénard argued that Pierre Rosanvallon "wishes to produce a theoretical narrative which, without being confined to the pure history of ideas, can grasp the singularity of a time and the originality of the political experiences produced by that singularity ... He endeavours to connect history, philosophy, and politics, and in so doing to show how these may be inadequate when they are treated separately from one another". A round table organized halfway through the week around the theme "Pierre Rosanvallon: cultural entrepreneur" also afforded an opportunity to discuss the publication projects initiated by Pierre Rosanvallon (*La République des Idées*, *La Vie des Idées* and *Raconter la Vie*) and his role as a teaching intellectual, who is resolutely engaged in public debate.

The plurality of disciplines represented and the angles chosen was telling of the dialogue that Pierre Rosanvallon, as a historian of politics, has successfully developed with philosophy, sociology, political science, law, and literature, around a common object: democracy. ■

**Marieke LOUIS (ATER)**

Source: *La lettre*, no. 39, March 2015

**Prof. Pierre ROSANVALLON**  
Modern and Contemporary  
History of Politics



- A series of interviews recorded for the programmes "À voix nue" and "Les nouveaux chemins de la connaissance" are available on France Culture Plus at <http://plus.franceculture.fr>
- The publication of the symposium proceedings is scheduled for 2015.

# *Big Data, Businesses and the Social Sciences*

**Prof. Pierre-Michel Menger, Chair of Sociology of Creative Work, organized a workshop on 2 June 2014 on the social, economic and scientific issues surrounding the uses, sharing, markets, and regulations of mass digital data.**

The mass production of digital data allows us to exploit information in unprecedented quantities. Many human activities can now be analysed with new means. The digital traces left by users of search engines, social networks or online shopping sites generate an exceptional mass of information, not only concerning Internet uses in general, but also on individuals' interests, consumption practices, and political or religious orientations. Beyond Internet, a comparable production of mass digital data is operated by a growing number of connected objects (human presence sensors, geolocation, bank cards, biometric passports, travel cards, etc.). Signal digitization is multiplying the sources generating information, and the means to store and to connect it. All of these unstructured mass data form what is called big data.

The big data phenomenon stands out for three reasons. First, it applies to all aspects of social and economic life. Second, it disrupts all usual distinctions between private and public, personal and relational, secret and disclosed, passive and explicit consent, customs, and trust. Finally, it owes its expansion to its inherently relational nature, which brings together all the previously discrete dimensions and areas of activity generating information. Social science questions relate first to the value creation process. How do companies capitalize on digital data? What operations do they implement to capture data, and then to format and analyse or sell them? Who are the consumers in the big data economy? The focus is on the sharing of the value created: in a two-sided market economy, personal data are collected without monetary compensation, as the service offered to consumers appears to provide symmetry of benefits. But the value of the collected data is growing with personal data exchange and marketing technology. Users of Internet and of connected objects can thus be seen as quasi-collaborators of digital companies. What does

this "informational contribution" mean? Should individuals' digital activities be considered *as work*, in the sense that this contribution is behind a part of large digital companies' spectacular productivity gains? These considerations raise a broader question on the transformations of work in an increasingly connected world, dominated by the Internet giants like Google, Facebook and Twitter. Finally, the ethical dimensions of the collection and exploitation of data for multiple known and more often unknown purposes are now central to the invention of a digital democracy.

This workshop, organized according to three areas of reflection, investigated the implications of these developments for the social sciences. As it was open to fields other than the sociology of work and markets, informaticians, jurists and political analysts were also present. The approach consisted first in outlining the social uses of mass digital data, whether strictly academic, commercial or private, while situating them in a socio-historical perspective and assessing the phenomenon's "revolutionary" nature. Second, big data were discussed as a field of research for the social sciences: what do these objects reveal about the social world in which they are deployed, and how can they be studied? Finally, the potential use of mass digital data as research tools for the social sciences was addressed: what perspectives do they open for sociology, economics and the humanities, and what practical issues surrounding storage, exploitation and interpretation do they raise? The industrialization of mass data impacts on the economic, political and scientific uses of information and demands a requalification of the value of the informational goods produced on such a large scale. ■

**Prof. Pierre-Michel MENGER**  
Source: *La lettre*, no. 39, March 2015

 Videos of the symposium are available at [www.college-de-france.fr](http://www.college-de-france.fr), on the professor's page.

**Prof. Pierre-Michel MENGER**  
Sociology of Creative Work



# Holocene North African Climate

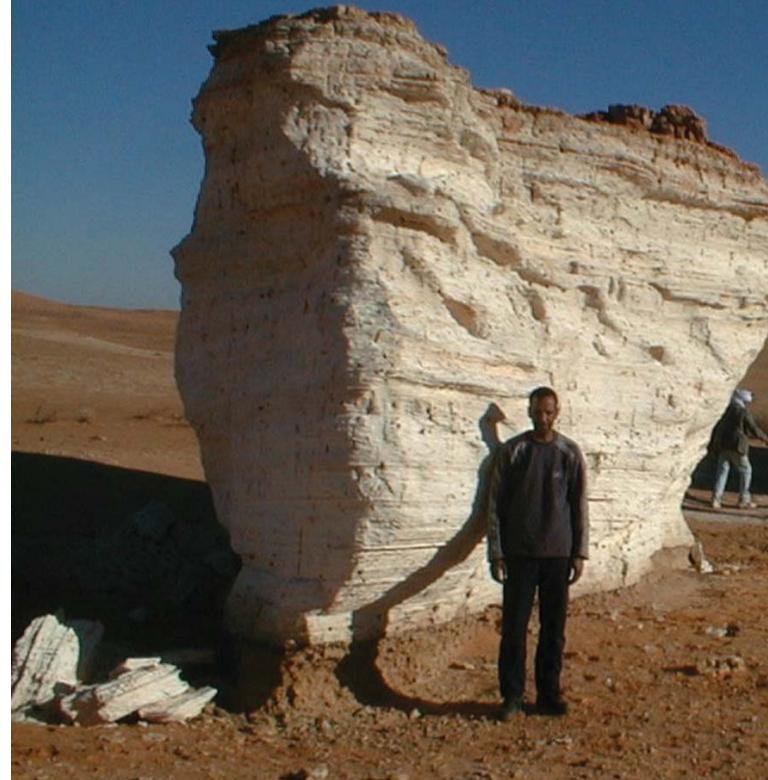
**During the Holocene, that is, the last 11,500 years, the North African climate has undergone significant changes. While the Sahara is now the largest desert on Earth, there used to be a “Green Sahara” at the beginning of the Holocene. It resulted from significant precipitations that were linked to the northward shift of the inter-tropical convergence zone, which was caused by the increase in summer insolation in the northern hemisphere.**

Although insolation has very gradually decreased during the Holocene, the transition between this period and the current desert climate is studied in depth by scientists and debated within their community.

After dedicating the symposium to the memory of Françoise Gasse, CNRS Emeritus Senior Researcher at the CEREGE in Aix-en-Provence, who passed away prematurely in April 2014, Édouard Bard showed that the work of this pioneer and that of other researchers in the field has revealed major variations in lake and paleolake water levels during the African Humid Period (AHP).

Yannick Garcin, from Potsdam University, Germany, then showed that the dating of the ancient shorelines of the Rift Valley lakes in Kenya supports the theory that the AHP ended rapidly, about 5,000 years ago. He also demonstrated that the intensity of precipitation can be reconstructed, by using the deuterium-hydrogen isotope ratio (D/H) of n-alkanes, that is, plant molecules carried by the wind and found in marine and lacustrine sediments.

Jessica Tierney, from the Woods-Hole Oceanographic Institution (USA), presented marine records of the D/H of n-alkanes in the Atlantic off the Mauritanian coast, and in the Indian Ocean



around the Gulf of Aden. These series suggest that the beginning and end of the AHP were quick and that they lasted for much less than a millennium. Peter de Menocal from Columbia University, New York, then pointed out that Saharan dust, measured in marine sediments off the north-west coast of Africa, also bear the trace of a sudden variation in the hydrological system.

Research by Stefan Kröpelin from Cologne University, on pollens and grains in the sediments of Lake Yoa in northern Chad, however, clearly seems to support the theory of a gradual change in the ground cover, from a tropical forest to the Sahel savannahs. Likewise, Florence Sylvestre, from the CEREGE, revealed that the pollens found in the sediments of Lake Chad indicated a gradual change of vegetation at the end of the AHP. However other proxies measured in these same sediments, directly linked to the hydrological system, show sudden variations which are consistent with those observed in marine archives.

Several mechanisms were put forward to explain the transformation of a gradual climate forcing into an abrupt climate variation, for example, the positive feedbacks of vegetation on water vapour, the coupling of the ocean and the atmosphere, and the modification of albedo by the rapid increase of Saharan dust carried by the wind. These mechanisms are studied and quantified using numerical models that simulate the atmosphere's interactions with the ocean and continental vegetation, as Martin Claussen from the Max Planck Institute for Meteorology in Hamburg explained in detail.

The North African climate and vegetation changes strongly impacted on the populations of the Neolithic Period. Stefan Kröpelin showed that they scattered to the East of the Sahara 8,000 years ago. With the aridification of the region about 5,500 years ago, the populations gradually migrated south, or took refuge on the banks of the Nile or around the rare oases.



**Prof. Édouard BARD**  
Climate and Ocean Evolution



Photograph: Françoise Gasse

◀ Holocene lacustrine deposits from Hassi El Medjna, Grand Erg Occidental, Algeria

Édouard Bard and His Serene Highness Albert II of Monaco



Studying genetic mutations and their occurrences in current populations, Laura Botigué from Stony Brook University, Stony Brook, New York, analysed the chronology of the encounters between the different populations and retraced their migrations. Paulo Sereno, from the University of Chicago, showed that the Gobero Complex in central Niger constitutes the largest and oldest cemetery in the Sahara. For 5,000 years from the beginning of the Holocene, two hunter-gatherer populations succeeded one another on the banks of this paleolake, where they buried their dead according to different funeral rites.

The papers delivered at the symposium provided an overview of current knowledge on Holocene climate change in North Africa, and on its environmental and societal consequences. The speed of the transition from the AHP to the climate we currently know in North Africa was discussed extensively, as were the mechanisms responsible for this change. In response to the gradual drop in summer insolation during the Holocene and to positive feedback mechanisms, migration of the monsoon area further south seems to have been quick, and to have changed the North African hydrological regime drastically in less than a millennium. The vegetation, fauna and human societies seem to have reacted more gradually to these events, due to their adaptability. ■

**Sophie DARFEUIL/Camille BOUCHEZ**

Source: *La lettre*, no. 39, March 2015



Videos of the symposium are available at [www.college-de-france.fr](http://www.college-de-france.fr), on the professor's page.

## Grande médaille Albert Ier

The Oceanographic Institute is a registered foundation established in 1906 by Prince Albert I of Monaco, an erudite explorer and member of the French Academy of Science. Prince Albert I was one of the pioneers of oceanographic research, to which he devoted close to thirty deep-sea biology expeditions from 1885 onwards. He also drew up the first bathymetric map. Today, the Oceanographic Institute supports the implementation of sustainable ocean management, with a view to reconciling the preservation of biodiversity with economic activities that are respectful of marine ecosystems. Through its two institutions, the Oceanographic Museum of Monaco and the Maison des Océans in Paris, it acts as a mediator between the scientific community, the actors of the maritime economy, political decision makers, and the general public.

Since 1949, the Oceanographic Institute has awarded the Grande Médaille Albert Ier annually to a highly qualified, internationally renowned scientist in the field of oceanography. This distinction is generally awarded alternately to a French scientist or a scientist from abroad. Recipients include oceanographers John Swallow, Christian Le Provost and Carl Wunsch, geologists and geophysicists Xavier Le Pichon, Wolfgang Berger and Anny Cazenave, as well as marine biologists André Morel, Victor Smetacek and Paul Falkowski.

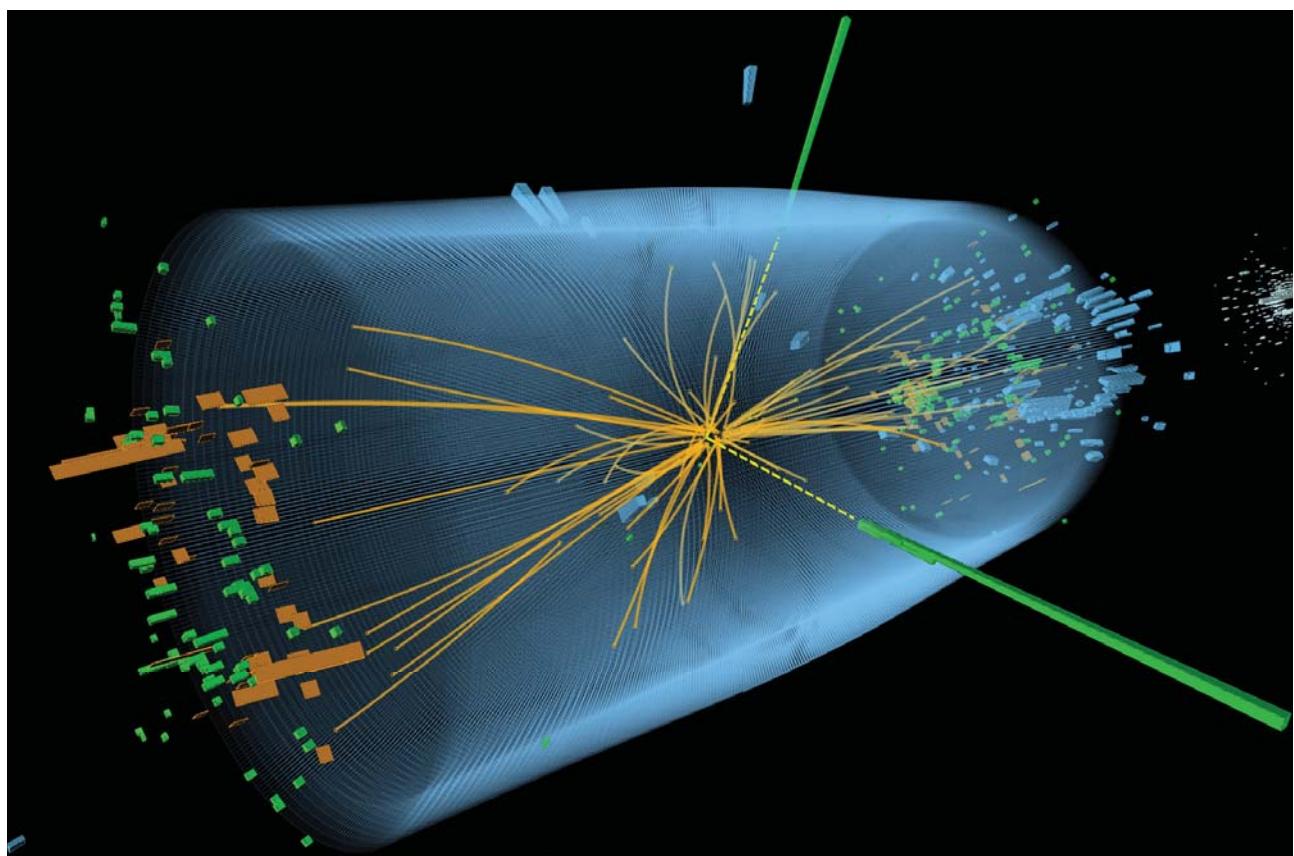
The Grande médaille Albert Ier was awarded by His Serene Highness Prince Albert II of Monaco to Édouard Bard, during the 20 October 2014 ceremony at the Maison des Océans, in the presence of Ségolène Royal, French Minister of Ecology, Sustainable Development and Energy, and many academics, notably Bernard Meunier and Catherine Bréchignac, President and Standing Secretary of the French Academy of Science respectively, and Pascale Delecluse, Director of the CNRS-INSU (Institut National des Sciences de l'Univers).

# A Boson Named Higgs

On 24 May 2013 the Collège de France Chair of Elementary Particles, Gravitation and Cosmology, created in 2004, organized a closing symposium entitled: “A Boson Named Higgs”. The origin of this initiative can be found in the Chair’s Inaugural Lecture in February 2005, when it was planned that the future discoveries of the CERN’s Large Hadron Collider (LHC), located near Geneva, would soon be the topic of an annual lecture series.

Unfortunately, due to several delays in the launch of the accelerator, these discoveries took longer than expected. The discovery of the “Higgs boson” only happened in July 2012, when the Chair’s last annual lecture series had just been completed. To make up for this “shortcoming”, the Chair organized a symposium entirely dedicated to this fundamental discovery, which was rewarded a few months later with the Physics Nobel Prize awarded to François Englert and Peter Higgs.

The existence of the “Higgs boson” is the “cherry on the cake” of what is called the Standard Model (SM), the different aspects of which the Chair presented for eight years. According to the SM, all known matter (that is, excluding the still mysterious dark matter) is made of a small number of so-called elementary particles. These constituents of matter are all “fermions”, particles characterized primarily by their inability to cohabit with a second identical fermion (Pauli’s exclusion principle). The most familiar example of



An event in the CMS detector interpretable as the disintegration of a Higgs boson into two photons (tracks in green) © Guido Tonelli

# ELEMENTARY PARTICLES, GRAVITATION AND COSMOLOGY CLOSING SYMPOSIUM 24 MAY 2013

a fermion is the electron. The exclusion principle implies that the electrons orbiting around an atom's nucleus must be in different states (or orbits) – which explains the periodic table of elements remarkably well.

On the other hand, in the SM the different interactions between fermions stem from their exchanging “bosons” among themselves. Unlike fermions, bosons like to cohabit with other bosons of the same kind. When a very large number of such bosons gather together, they form a macroscopic field. Here the most famous example is the photon. The field produced by a large number of photons is none other than the widely known electromagnetic field.

The Higgs boson is no exception to this rule: like the photon, it can also generate a field, called the Higgs field. But unlike an electromagnetic field, the Higgs field does not have a direction in space. It is what is called a “scalar” field, which bears more resemblance to a density or temperature field. The originality of the Higgs field lies in the fact that, according to the SM, it already exists in the absolute vacuum, since, by properly choosing its value, it is possible to lower the energy with respect to the one which would have prevailed in its absence (whereas an electromagnetic field can only increase the energy).

The presence of this field has a spectacular effect on (almost) any other particle living in it: the given particle, which would have no mass without the Higgs field, acquires a mass proportional to its “charge” (the analogue of the electric charge but for the Higgs field). Essentially, only the photon (that does not have this charge) remains massless. The other elementary particles, particularly the fermions that form all visible matter, have a non-zero mass in agreement with observations.

Although this was all very nice from a theoretical point of view, until then no experimental proof existed that elementary particle masses are linked to the existence of this field in the “vacuum” and therefore, ultimately, to the existence of the boson that produces it. Its discovery at CERN spectacularly confirmed what theorists had expected for over fifty years! Without any doubt the event warranted a celebration worthy of the Collège de France.

The closing symposium sought to include all the ingredients that contributed to the discovery of the boson in question.

After a brief introduction by the Chair, theorist Jean Iliopoulos (ENS Paris) recalled the ideas, which, in the 1960s, had led to proposals for the BEH (Brout-Englert-Higgs) mechanism and the existence of a boson associated with it.

Fabiola Gianotti (CERN) and Guido Tonelli (Pisa) presented the developments in particle detectors stemming from their experimental collaborations (ATLAS and CMS respectively) which, through billions of collisions, allowed for particle detectors to single out those containing the precious boson. At the same time, they reviewed the data analysis.

Jorg Wenninger and Frederic Hemmer (respectively a physicist and a systems engineer at CERN) discussed the technological challenges (building the LHC) and the challenges in informatics (data processing) that were so crucial to the LHC's success.

Riccardo Barbieri (ENS Pisa) then discussed possible theoretical spin-offs of the discovery. To conclude, a roundtable moderated by the Chair considered some possible post-Higgs scenarios. ■

**Prof. Gabriele VENEZIANO**

Source: *La lettre*, no. 38, June 2014

## Programme

### Introduction

Gabriele Veneziano, *Collège de France*

### From Design to Discovery

Jean Iliopoulos, *ENS Paris*

### ATLAS

Fabiola Gianotti, *CERN*

### CMS

Guido Tonelli, *INFN, Pise*

### The Road towards High-Power LHC

Jorg Wenninger, *CERN*

### The Worldwide LHC Computing Grid

Frédéric Hemmer, *CERN*

### Implications and Theoretical Perspectives

Riccardo Barbieri, *SNS, Pise*

### After Higgs, What's Next?

Gabriele Veneziano, *Collège de France*



Videos of the symposium are available at  
[www.college-de-france.fr](http://www.college-de-france.fr), on the professor's page.

### Prof. Gabriele VENEZIANO

Emeritus Professor,  
Elementary Particles, Gravitation  
and Cosmology (2004-2013)



**ARCHITECTURE  
AND URBAN FORM**  
SYMPOSIUM 23 JUNE 2014

► “Reinforced concrete, the Radiation of French Thought and creation throughout the world”, illustration in *Cent ans de béton armé*, 1849-1949, Paris, 1949.

# Modern Architecture, Promise or Menace?

**Contrary to what the myth of the irresistible progress of forms and techniques would have us believe, the experience of architectural modernity is not just one of success.**

Many of the expectations generated by the industrial era – which led to remarkable experiments – were not met, and the early moderns' attempts were often disfigured once scaled to the mass production of public operators or the private sector. The promise of a better life heralded by garden cities, high-rise housing schemes and urban renovations, and symbolized by new aesthetics, was short-lived. Social issues transformed the reality and meaning of works that were at odds with the discourses and theoretical projects from which they derived.

Echoing the fourteenth Venice Architecture Biennale, which sought to convey how modernity had been “absorbed” – as Rem Koolhaas put it – by the different national cultures, this symposium analysed the state of modern France's architecture from a European perspective, combining the approaches of historians, architects, social scientists, and public actors. Theoretical positions and relations with intellectuals and politicians were considered from a research point of view, while practitioners attested to the influence that the most memorable projects and buildings still have today.

In his paper on political aesthetics and architecture, the art historian Christian Freigang, professor at the Free University of Berlin, discussed August Perret's theories in the context of France's cultural controversies before 1914 and during the 1930s. Looking at the discourse and work of Marcel Lods, a radical modern architect of the following generation, historian Pieter Uyttenhove showed how the issue of mass collective housing transformed professionals' representation of themselves in the social field.

Historian Pascal Ory, professor at the University of Paris 1 Panthéon-Sorbonne, examined architects' capacity to act as public intellectuals. He focused on the history of French culture in the 1930s and in the contemporary era, to formulate new hypotheses regarding the social figure of the architect.

In response to his arguments, sociologist Jean-Louis Violeau, professor at the École Nationale Supérieure d'Architecture

Paris-Malaquais, compared the May 1968 crisis with the political situation in May 1981, thus highlighting the new ideals and practices through which architects endeavoured to rebuild their relationship with reality. The town planner Vincent Feltesse, president of the Fédération Nationale des Agences d'Urbanisme, adopted a more political perspective. He described the experiments conducted at the head of Bordeaux's urban community's planning office, designed to bring urban projects closer to their addressees, as regards both their social content and their spatial form.

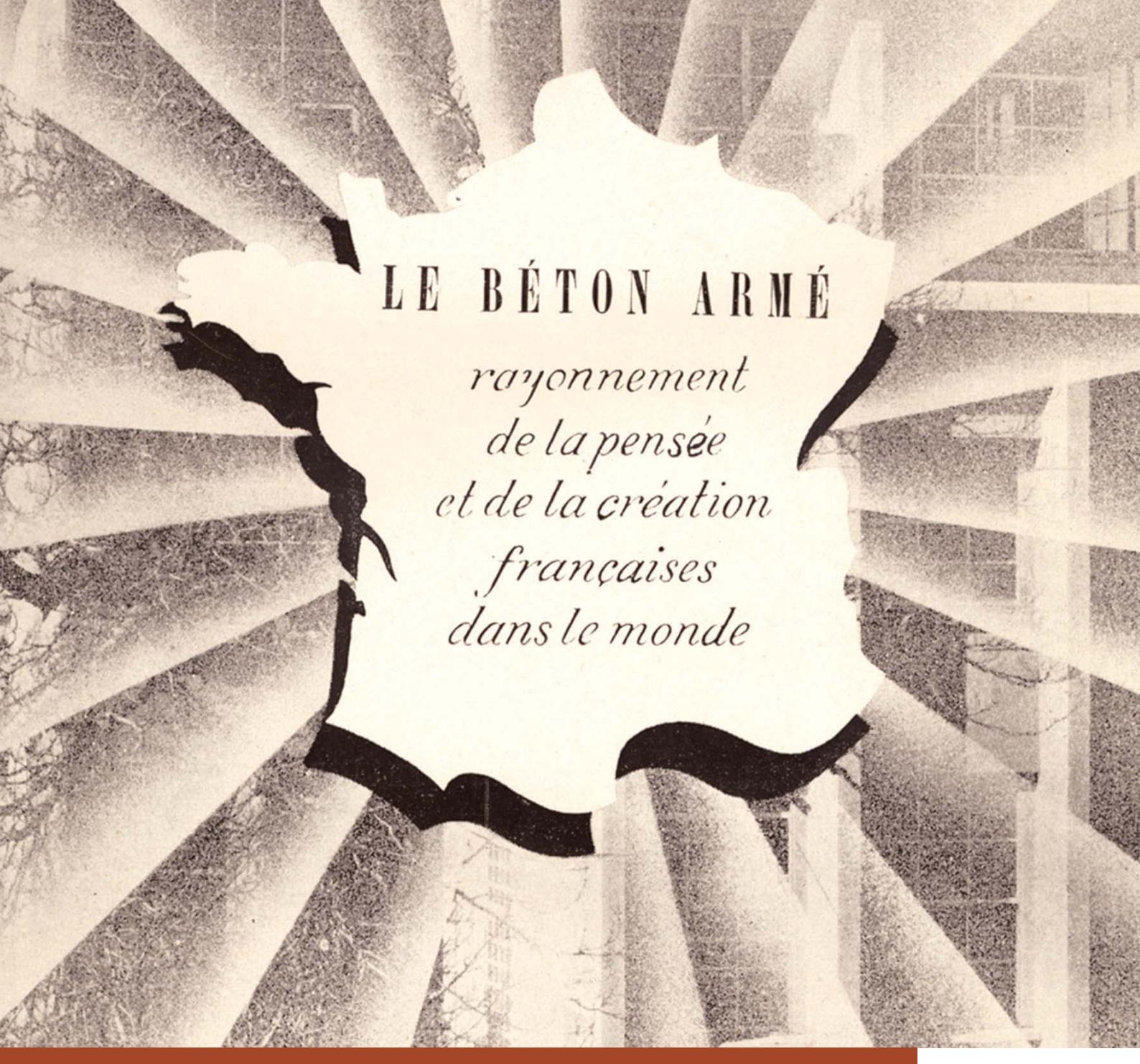
The specific configuration of French modernity was considered from several points of view. Historian Carlo Olmo, professor at the Polytechnic University of Turin, contrasted post-war Italy with the French situation in order to assess the latter's originality. Jean-Louis Cohen, professor of architectural history at New York University and a pluri-annual visiting professor at the Collège de France, considered forms of collaboration between architects and engineers, as well as European critics' interpretations of French production. Vanessa Grossman, a PhD student in the history of architecture at Princeton University, explored the formation and transformation of the notion of “brutalism”, often applied indiscriminately to describe 1950s and 1960s buildings.

As a counterpoint to these historical analyses, two practitioners shared their thoughts on the modern buildings and urban complexes informing their projects: Marc Barani discussed his interpretation of Pierre Chareau's Maison de Verre and Le Corbusier's Cabanon; and Gaëlle Péneau presented a set of modern architectures in the Nantes area that punctuated her intellectual and professional journey. In so doing she highlighted the extent to which historical themes continue to inform practice today. ■

**Jean-Louis COHEN**

*Source: La lettre, no. 39, March 2015*

- Videos of the symposium are available at [www.college-de-france.fr](http://www.college-de-france.fr), on the professor's page.
- As part of his teaching at the Collège de France, Jean-Louis Cohen organized a symposium on “Architecture - Between Practice and Scientific Knowledge” held on 16 January 2015.



# LE BÉTON ARMÉ

*rayonnement  
de la pensée  
et de la création  
françaises  
dans le monde*

## ***Exhibition at the Palais de Chaillot***

Jean-Louis Cohen curated an exhibition held at the Cité de l'Architecture et du Patrimoine in the Palais de Chaillot from 24 April to 8 September 2014, on the theme: "Architecture in Uniform. Designing and Building for the Second World War".

The exhibition explored developments in architecture during the Second World War, analysing the effects of the conflict on the built environment and on the discipline itself.

It thus filled a considerable historical gap, by examining the works and achievements of the architects and designers active in the main countries involved in the war. It showed how the war accelerated technological innovation processes and triggered a change of mind-sets, leading to the unchallenged supremacy of modern architecture after 1945.

The exhibition built on Jean-Louis Cohen's book that earned him the 2012 *Prix du livre d'architecture: Architecture in Uniform. Designing and Building for World War II*, Paris, CCA Montréal/Éditions Hazan, distributed by Yale University Press, 2011 (also available in French).

**Jean-Louis COHEN**  
Collège de France Pluri-Annual  
Visiting Professor  
Sheldon H. Solow Professor  
in the History of Architecture,  
Institute of Fine Arts,  
New York University



LILIANE BETTENCOURT  
TECHNOLOGICAL INNOVATION  
SYMPOSIUM 14-15 OCTOBER 2013

# Filling Gaps in Materials Space: Methods and applications

**In October 2013, a two-day symposium was held to conclude the year 2012/2013 of the Liliane Bettencourt Chair of Technological Innovation which had been devoted “customized materials”.**

The theme chosen for this symposium was “Filling Gaps in Materials Space: Methods and applications”. Developing “customized materials”, which is proving to be a major challenge for modern materials science, first and foremost means creating a material, in the general sense described in the lecture series, in which unusual properties are combined, such as hardness and tolerance to damage, or thermal inertia and conductivity. Hence the choice of the expression “filling gaps in materials space”. The aim of the symposium was to identify feasible methods to meet this challenge (microstructure control, architecture control and bio-inspiration).

It brought together expertise from fields as diverse as physics, chemistry, mechanics, materials science, applied mathematics, and biology. A series of presentations provided examples of “engineered” materials and “natural” materials, in a wide variety of areas such as building insulation, sensors, electromagnetic field shielding and biomedical applications, and in living beings as diverse as molluscs, sharks, plants, and fish. They demonstrated both possible advances, with a joint approach combining “architectured materials” and “bio-inspiration”, and the challenges raised for the design as well as the elaboration of these materials. It became apparent that the interfaces between materials of different kinds would play a major role in future developments, be it through physico-chemistry, through forms or through potential gradients. The design of materials with ranked microstructures, combining geometry and microstructures, appeared as the natural field of exploration at the interface between materials science and biology. The analysis, from an evolutionist perspective, of the “materials solutions” found in nature seems very promising. Additive manufacturing technology offers an appealing alternative to the “bottom-up” strategies stemming from soft chemistry.

The communities gathered for this symposium, which meet too infrequently, have an interaction potential that could generate a wealth of “technological innovation” and knowledge on the evolution of living beings and their adaptation to external stimuli. In this sense, this symposium, which brought together teams from France, Germany, Belgium and the United States, was the natural conclusion of the whole lecture series, in the spirit of the Collège de France which presents research in the making, and in that of the Liliane Bettencourt Chair of Technological Innovation, which endeavours to stimulate technological innovations that may stem from it. ■

**Yves BRÉCHET**

*Source: La lettre, no. 38, June 2014*



Steel wool

- Videos of the symposium are available at [www.college-de-france.fr](http://www.college-de-france.fr), on the professor's page.
- This Chair is funded by the Bettencourt Schueller Foundation.

**Yves BRÉCHET**

Professor at Grenoble-INP, Visiting Professor at McMaster University (Canada) and Shanghai Jiao Tong University (China). High Commissioner for Atomic Energy and member of the Académie des Sciences

# From Medical Images to Computational Medicine

**The international symposium *From Medical Images to Computational Medicine* was held in English on 24 June 2014 at the Collège de France.**

It highlighted some of the most advanced research activities in computational medical imaging and the computational modelling of organs, to further understanding of human anatomy and physiology. Ten internationally renowned researchers participated in it, alongside its organizer and Annual Chair of Informatics and Computational Sciences, Nicholas Ayache.

Sir Michael Brady (Oxford) and Daniel Rueckert (Imperial College London) were the first to speak. The former presented biophysical models tailored to the computational analysis of anatomical and metabolic images of various forms of cancer (breast cancer, rectal cancer, skin cancer), and the latter presented sparse representations of the images and machine learning methods, designed to extract clinically useful information from cardiac and cerebral images, particularly MRIs of the foetus. Guido Gerig, from the University of Utah, discussed some spatiotemporal models for the analysis of image sequences to quantify changes, especially the development of brain structures in new-borns and young children. Antonio Criminisi (Cambridge) then focused on statistical learning algorithms, used to locate organs automatically in medical images of the whole body, in order to segment cancerous lesions, or to quantify the

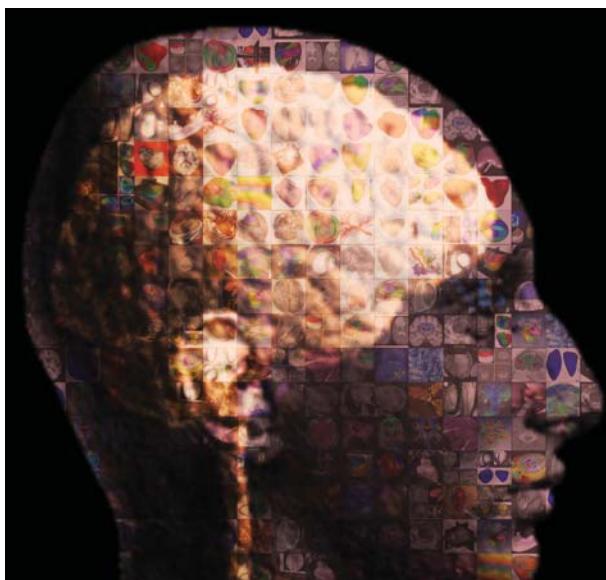
movement of Parkinson's patients placed in front of video cameras. The morning was concluded by Peter Hunter, from the University of Auckland (New Zealand), who presented the work of the international project *Physiome* and that of the European consortium *Virtual Physiological Human* on the multi-scale modelling of the physiology of the human body and its clinical applications. Five researchers then presented their advances in this domain. Olivier Faugeras (University of Nice Sophia Antipolis) discussed models of neuron populations at different spatiotemporal resolutions, and mathematical and algorithmic analysis and simulation tools, which draw on the theories of dynamic systems, stochastic calculus, mean field, and large deviations. Looking at biomechanical models, James Duncan (University of Yale, USA) considered the sparse image representations used to analyse medical images, particularly in neuro-imaging and cardiac imaging.

David Hawkes (University College London) commented on the role of multi-scale computational medical imaging in the guiding of surgical operations, especially for prostate, breast and colon cancer. In a lecture titled "Augmented Reality in the Operating Room", Nassir Navab (Technische Universität München, Germany) shed light on the use of augmented reality in surgery, and of innovative automated image acquisition systems. The last speaker was Dorin Comaniciu from Princeton (USA), who discussed a multi-scale computational model of the heart, which simulates its metabolism and its electric, mechanical and hemodynamic activity, and which has a range of potential applications in cardiology.

Nicholas Ayache, who opened the day by addressing the challenges surrounding the personalized digital patient, concluded the symposium by considering the future of computational medical imaging and of the digital patient. This symposium marked the end of a lecture and seminar series, *The Personalized Digital Patient: Images, medicine and informatics*, which presented the algorithmic, mathematical and biophysical foundations of computational medical imaging. It provided a good illustration of the international state of the art of computational medical imaging and the computational modelling of human organs. ■

**Nicholas AYACHE**

Source: *La lettre*, no. 39, March 2015



Set of medical images of the digital patient

 Videos of the symposium are available at [www.college-de-france.fr](http://www.college-de-france.fr) on the professor's page.

**Nicholas AYACHE**  
Senior Researcher,  
Inria



LILIANE BETTENCOURT  
TECHNOLOGICAL INNOVATION  
JUNE 2014 LECTURE SERIES

►  
*The Holy Family*, Constantin Abraham (1785-1855) by Raphaël (aka), Sanzio Raffaello (1483-1520), hard porcelain, Sèvres, Cité de la Céramique

# Art and Chemistry

**Philippe Walter's teaching, which he delivered as holder of the Liliane Bettencourt Annual Chair of Technological Innovation, was completed with two lectures on "practical work" to deal with a real case. The conditions and challenges of interdisciplinary research combining analytical chemistry, art history and archaeology were thus discussed in relation to specific works.**

A few weeks earlier a detailed analysis had been carried out on the objects presented in the large Marguerite de Navarre lecture theatre, using portable analysis instruments developed by Philippe Walter's laboratory (Laboratory of Molecular and Structural Archaeology, UPMC-CNRS). These chemical characterization methods led to a discussion on the complexity of the materials used by artists, and on their specific practices, followed by reflection on the conservation of artwork.

The first lecture, "Ceramics and the Memory of Raphael's Colours", put the spotlight on a painting on porcelain plaque from the national collections of the Cité de la Céramique-Musée National de la Céramique de Sèvres: the 1818 copy of Raphael's *Holy Family*, by the Swiss artist Abraham Constantin. Through a discussion with Véronique Milande, head of the preventive conservation and restoration service of the museum, the lecture cross-compared different perspectives and disciplines. The copying of paintings on porcelain plaque developed in the early nineteenth century as a way of guaranteeing heritage conservation. Masterpieces of European art were reproduced on ceramics to keep a memory of the colours in a material that was then considered to be inalterable. Many old paintings were deteriorating and required conservation treatments. Raphael was one of the most copied painters, to the extent that Stendhal wrote in *Mémoire d'un touriste* (1837): "in two hundred years, we will know Raphael's frescos only through Mister Constantin". This practice was particularly demanding, as copyists had to combine great artistic talent with the qualities of a chemist who ensured that the colours, once fired, would be faithful to those of the model. The rendering of these works painted on porcelain is particularly striking and the colours of this *Holy Family* offer a magnificent example of it. Their chemical analysis through X-ray fluorescence spectrometry and X-ray diffraction shed light on the mix of metallic oxides produced and allowed for a comparison with the recipe books still currently in use at the Manufacture.



© RMN-Grand Palais (Sèvres, Cité de la céramique) / Martine Beck-Coppola

"Revealing the Know-How of Medieval Goldsmiths" was the theme of the second lecture delivered with Isabelle Bardies-Fronty, head curator at the Musée de Cluny - National Museum of the Middle Ages, to understand better the history of remarkable Merovingian finery preserved in this museum, as well as the wealth of technical knowledge and the circulation of peoples and materials in the early Middles Ages. The objects studied were brought to light in 1862, in a gravel pit near Valence d'Agen (Tarn-et-Garonne, France). These are two aquiliform fibulas and a belt buckle plate, some of the most beautiful sets of Visigothic art in Europe. These objects, probably taken from the same sixth century grave, attest to the artists' refinement. The animal theme of the two eagles with stylized forms, the geometric elegance of the buckle plate and the bright colours of the three objects are all characteristic of the gold- and silversmith work of the Visigoths, who settled in south-western Europe in the fifth century and successively had Toulouse and Tolède as kingdom capitals. The gilding techniques and the glass and garnet inlays, better understood through scientific analyses, illustrate the craftsmen's know-how and tell us about the circulation, sometimes over long distances, of the materials used to decorate their finery. ■

**Philippe WALTER**

Source: *La lettre*, no. 39, March 2015

► The videos of the lectures delivered on 10 and 24 June 2014 are available at [www.college-de-france.fr](http://www.college-de-france.fr), on the professor's page.



**Philippe WALTER**  
CNRS Senior Researcher,  
Head of the Laboratory of Molecular  
and Structural Archaeology at  
Pierre and Marie Curie University



# Around 1914

New Figures of Thinking:  
Science, art and literature

AUTUMN SYMPOSIUM  
16-17 OCTOBER 2014

Throughout 2014, there have been many commemorations of the centenary of the Great War. Everywhere the first global conflict has aroused interest that could not have been foreseen ten or twenty years ago, as though it was only with the passing of the last veterans that the world took stock of the mark left by the war on the following century.

It seems that everything has been said about responsibility for triggering the hostilities, the horror of the trenches, and the disappointments of the peace treaties. The Collège de France wished to raise new questions that would challenge general beliefs, particularly regarding the long post-war period. On 16 and 17 October 2014, it organized its Autumn Symposium on the following subject: "Around 1914, New Figures of Thinking: Science, art and literature".

With insightful and multidisciplinary papers, the symposium considered the warning signs, the profound changes brought on by the conflict and their long-term effects. More particularly, the emphasis was put on disruptions and reconfigurations of science, society, mind-sets, representations, philosophy, literature and art, whether or not they were directly triggered by the war. ■

Paul Klee, *Rocky Landscape (with Palms and Fir Trees)* 1919, 155,  
oil and pen on cardboard, 41.8 x 51.4 cm  
Zentrum Paul Klee, Bern, donation of Livia Klee

# Around 1914

**Every autumn since 2001, the Collège de France has inaugurated the academic year with a two-day symposium bringing together specialists from various fields, in science and the humanities, to delve into a theme that can be approached from different angles. In 2014, it seemed fitting to focus on 1914.**

The Collège de France's approach differs from those of other events devoted to the first global conflict. The causes and consequences of the Great War have been analysed in countless studies by historians over the past hundred years. The year of the centenary saw these analyses multiply without the subject ever being exhausted, so great is the complexity of the events and so many are the interpretations and reflections that they call for. One of the reasons for the fascination with this subject is that the period of a few years surrounding 1914 appears to have been a breaking point – a geopolitical and historical breaking point, of course, but also one in the ways of understanding, seeing and conceiving of the world. Understanding the world is within the remit of science, and at that critical time, science underwent a profound revolution, both in its concepts and in its practices. Seeing the world is the prerogative of the artists who represent it through the prism of their sensitivity, and around 1914 the different forms of art (painting, music, cinema and literature) changed profoundly. Understanding the world means asking questions on the human condition, on the relationship to oneself and to others, and in this respect as well, the Great War was a time of far-reaching transformation in the fields of psychiatry, psychoanalysis, sociology, and anthropology.

This symposium was not set within the geopolitical and historical field. We did not seek directly to discuss the events that led to this war or that followed it. We endeavoured to analyse the major transformations that accompanied it in all the above-mentioned domains. These had led Stefan Zweig to refer nostalgically to the time before 1914 as "yesterday's world", where things were experienced, understood and felt differently. Of course, the context of the war cannot be ignored; it had a strong influence on certain scientists and creators, either by inspiring the theme of their work (I am thinking of painters and writers), or by guiding their work (I have in mind the developments of traumatology or psychiatry, or yet the chemists involved in the development of poison gases, the first weapons of mass destruction). But this direct context cannot explain most of the transformations that took place at the time. The revolution in physics (relativity and quantum physics) began before the war, and continued during and after the war, without relating directly to the events, even though they greatly influenced the conditions in which discoveries were made and spread. Likewise, the major transformations in art (I am thinking about Cubism and German Expressionism) started before 1914. However the emergence of the new forms of art during the early twentieth century can be seen as the expression of a form of premonitory concern about the events that were to shatter Europe. ■

**Excerpts from the paper delivered by Prof. Serge HAROCHE**  
*Source: La lettre, no. 39, March 2015*

- The event was organized with the support of the Hugot Foundation of the Collège de France.
- The full paper is available at [www.college-de-france.fr/site/colloque-2014/symposium-2014-10-16-09h00.htm](http://www.college-de-france.fr/site/colloque-2014/symposium-2014-10-16-09h00.htm)



**Prof. Serge HAROCHE**  
Quantum Physics

# War, Literature and Democracy



—“Tell me, you writing chap, you'll be writing later about soldiers, you'll be speaking of us, eh?” —“Why yes, sonny, I shall talk about you, and about the boys, and about our life”. “Tell me, then—he indicates with a nod the papers on which I have been making notes. With hovering pencil I watch and listen to him. He has a question to put to me. —“Tell me, then, though you needn't if you don't want—there's something I want to ask you. This is it; if you make the common soldiers talk in your book, are you going to make them talk like they do talk, or shall you put it all straight—into pretty talk? It's about the big words that we use. For after all, now, besides falling out sometimes and blackguarding each other, you'll never hear two poilus open their heads for a minute without saying and repeating things that the printers wouldn't much like to print.<sup>1</sup>

Barbusse added this page to his novel *Under Fire* after a dispute with the editorial staff of the newspaper *L'Œuvre*, which published the novel as a serial and earned it popular success. Though left-wing, this newspaper censored his *poilu* slang words. Slang words were of course found in French literature before Barbusse (in Balzac, Zola and Lucien Descaves), but they were rare, isolated and concealed, and Barbusse's novel was a turning point in this matter. Céline long thought he could do no better, before *Voyage au bout de la nuit* (1932) which, like all the best French novels on the Great War, was published much later, in the early 1930s, after the end of the post-war years and at the dawn of the pre-war years. It may seem naïve to say that the democratization of the novel materialized through slang words.

Yet even though social mixing was limited in the trenches, it transformed language. Many common French words come from the war, for example and among many others *cafard* and *pagaïe*, unknown before 1914, and ubiquitous after 1918. *Cafard*, meaning boredom, spleen, the melancholy of inactivity, was used in the Army of Africa posted far off in the desert. This evil was also called *saharite*, *soudanite* or *biskrite*, and it suddenly invaded our language. In 1918 two doctors published a book entitled *Le Cafard*, their second volume on the psychology of the soldier after *Le Courage*.<sup>2</sup> Boredom [*cafard*] appears throughout war books, as the epidemic of the front that replaced bleakness [*à la place du noir*].

The other term, *pagaïe*, meaning disorder, agitation, chaos, anarchy, came from sailors, for *mettre en pagaïe* meant “dropping the anchor in an emergency”, and the term soon became synonymous with the war itself: from the parade to the *pagaïe*, it is what happens when a squad, a section or a company attacks and the ranks come undone. The concept of war, for a foot soldier who sees it from below, is *pagaïe*. The word is found in all the books. So much so that a book on the war could be entitled

*La Grande Pagaïe*, in 1937, the same year as the film *La Grande Illusion* was made, without the reference raising the slightest ambiguity.<sup>3</sup>

The Great War democratized French language, in that it made it less controlled, less censored, less restricted, and several superb dictionaries immediately recorded the transformations of spoken language through speech from the trenches.<sup>4</sup> But what did it do to literature? It has often been pointed out that the first effect of the war was to bring French literature back to tradition, poetry to Alexandrines and novels to naturalism, after the year 1913 had seen the triumph of international modernism: Apollinaire's *Alcools*, Cendrars' *The Prose of the Trans-Siberian*, Braque and Picasso's collages, Russian ballets and Igor Stravinski's *Rite of the Spring* at the Théâtre des Champs-Élysées, Proust's *Du côté de chez Swann*, the Armory Show in New York, etc. Yet in the army, writers preferred convention, before another modernity, that of surrealism, surfaced after the war and overshadowed it (Breton, Aragon, and Éluard denied that the war had inspired them). ■

**Excerpts from the paper delivered  
by Prof. Antoine COMPAGNON**  
Source: *La lettre*, no. 39, March 2015

(1) *Under Fire: The Story of a Squad*, New York: Penguin Books, [1916] 2003.

(2) Doctors Louis Huot and Paul Voisenel, *Le Cafard*, Paris: Grasset, 1918.

(3) Adolphe Javal, *La Grande Pagaïe*, 1914-1918, Paris: Denoël, 1937.

(4) Albert Dauzat, *L'Argot de la guerre, d'après une enquête auprès des officiers et soldats*, Paris: A. Colin, 1918; Gaston Esnault, *Le Poilu tel qu'il se parle. Dictionnaire des termes populaires récents et neufs employés aux armées en 1914-1918, étudiés dans leur étymologie, leur développement et leur usage*, Paris: Bossard, 1919.

The full paper is available at [www.college-de-france.fr/  
site/colloque-2014/symposium-2014-10-16-15h30.htm](http://www.college-de-france.fr/site/colloque-2014/symposium-2014-10-16-15h30.htm)

**Prof. Antoine COMPAGNON**  
Modern and Contemporary  
French Literature: History,  
Criticism, Theory



# The War Transformed Love

**"The war transformed love", wrote Blaise Cendrars, who himself lived through this dramatic experience. But what else? How did men and women experience the Great War, not only in their affective, romantic and sexual relationships, but more generally in everything forging their relationships: family life, intimacy, the public and the private spheres, work, writing, images, the body and the soul?**

The war was first the triumph of the order of the sexes: men at the front, as virile fighters, and women behind the lines, helping, nursing them, standing in for them, and waiting for them. Women were comforted in their traditional and maternal role as auxiliaries and nurses. The nurse shrouded in white: such was the quasi-religious embodiment of femininity. For the declinists of the Belle Époque, there was a morality of the purifying, regenerative war. "War, the hygiene of the world", the futurists proclaimed. But the war lasted, and had unexpected effects.

The first were demographic. The drop in marriage and birth rates exacerbated the looming demographic crisis. The number of weddings, which were often postponed, decreased despite the hasty officialization of many unions, especially among the working class, where cohabitation was frequent. This did not however compensate for the decline, even though formalities were simplified. In 1915, a law introduced marriage by proxy so that couples could get married "remotely", but it lacked poetry and rapidly declined. Instead, furloughs, allowing for brief espousals, soon prevailed. But why get married in the face of such uncertainty?

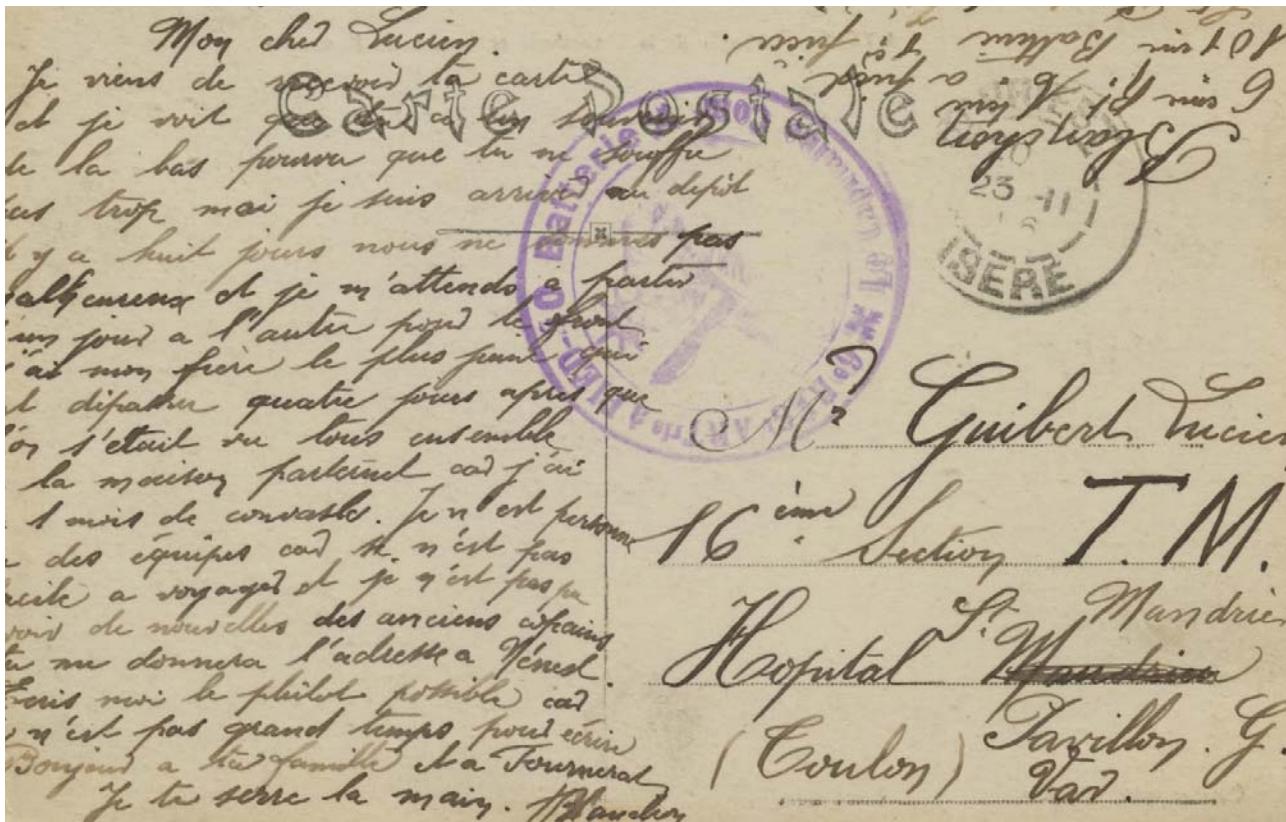
The separation was brutal (over three million men were mobilized, many more over the course of the war) and took wholly unprecedented proportions. It disorganized the home, work, intimacy, and roles. People focused on what was most urgent, then settled into the war. They attempted to preserve a link that proved vital. Correspondence played a major role in this respect. In a way, it trivialized the war, accommodating the tragic and making it acceptable. Not that the soldiers kept silent about the war and its operations. Forced to be discrete onsite, they increasingly described the horrors of the front; the mud, the lice, the promiscuity, the bombings, the blood, and the corpses. At first they sought to offer reassurance. The "Krauts" would be defeated, that was certain. Then doubt crept in; those people were tougher than they had thought. But did the women understand? Did they hear? Everyday life was more speakable and filled letters

with reassuring repetition. The soldiers spoke about the food, the much-appreciated parcels, the random sleeping arrangements for the soldiers, etc. They inquired about work in the fields, the course of business, the children's behaviour, and so on. Forced to delegate their role, they wanted to carry on leading and advising their wives, especially about firmness in their children's education, always fearing they would lack virility without them. They felt stripped of their paternity, the importance of which they directly experienced.

They also spoke about feelings. Above all, they feared being left and cheated on, and saw every late letter as a sign of abandonment. Even Louis Pergaud, so certain of Delphine's love, became alarmed and reprimanded her: "Do you not have time to write to me?" Sexuality was more difficult to talk about. It was expressed differently depending on social class and writing abilities, and the degree of prior intimacy. Louis Pergaud excelled at this and expressed his desire more and more strongly. Modest at first, he spoke of "kisses on your beautiful eyes". He spoke of "very strong" and "repeated" embraces. He asked for "a warm and passionate kiss as you know how to give them to me and for which I am now so intensely nostalgic at all times" "I promise you such embraces, my dear lassie, and I will caress you, cuddle you with such fervour. And then, at last perhaps we will have the baby we are hoping for", he wrote in February 1915. He was killed a month later. Pergaud was not the only one who wrote about his carnal love. Clémentine Vidal-Naquet<sup>1</sup> gives other examples of the erotic and "emotional inflation" created by longing, by absence, and to a certain extent, appeased by recollection (of the bedroom and the bed) and anticipation of expected happiness. It was not only the men's doing, but also that of their wives – and this was very new, as modesty had until then silenced women.

"There are things that we do and that we do not talk about, and those are precisely the best ones", said one wife.<sup>2</sup> Paradoxically (but is it so paradoxical?), the war stimulated the desire for intimacy and shared pleasure. It eroticized marital love as much as other forms of sexuality, pursuing the trend that had started before the war, as Alain Corbin has shown.<sup>3</sup>

Louis Pergaud condemned the army's puritanism. In his sector, the command had prohibited women's visits. He emphasized this rise of latent eroticism expressed in officers' saucy conversations (particularly in the artillery) and in the *poilus'* talk and correspondence. He described this situation quite crudely in a letter to a friend (Marcel Martinet, 10 March 1915): "If we ever entered Germany, I think it would be very difficult to prevent the *poilus* from giving back to the Gretchen the sperm that their cousins or



A poilu's postcard, 1916

fiancés sowed at home". This was a clear allusion to the rapes practised by the invaders, which begot several thousands of natural children<sup>4</sup> and was argued to legitimize a revenge of the same kind. Women's bodies have always been a real and symbolic stake of national struggles. A battle field, legitimate booty.

The war did not moralize society, as the declinists had expected it to. Sexual deprivation<sup>5</sup> caused men to resort to prostitution, both clandestine and then organized at a late stage (1918) in "countryside brothels", which some officers (for instance General Mordacq) sought to turn into hygiene and prophylactic regulation centres, inspired by German models and designed to prevent the fast-growing venereal peril. The war contributed to normalizing and medicalizing sexuality. More broadly, "doctors' mass political involvement in this Great War laid the foundations of a medical totalitarianism".<sup>6</sup> The war reinforced the role of the State in all areas, including the private sphere. Conversely, it resulted in sharpened awareness of the desire for intimacy and space, a life of one's own. Increased control naturally fuelled the sense of individuality.

But the war had many other effects on gender relations, particularly as far as work was concerned. In the fields, the factories, and even at the head of companies, women "replaced" men. They exercised new responsibilities, handled money, made decisions, left the space of the home, and made new encounters. Married female workers, who in 1907 had finally been granted the right to receive their salaries directly, now freely had access to higher earnings. In the Taylorized space of the factory, they discovered discipline, but also benefits<sup>7</sup>, they readily united, and even made demands. In 1917, "munitionnettes" and "shopgirls" marched in the streets of Paris together to uphold their rights. Women had gained autonomy, independence, and sometime freedom in their love lives. Some were alarmed and lamented

the luxury of "silk stockings" and "war profiteers". This profiteering was grossly exaggerated, as these women had to manage a difficult everyday life, bearing family responsibilities (children, sometime elderly parents) and the anguish of tomorrow alone. But these fantasies haunted the trenches and stirred anxiety among the forsaken men. The war may have brought couples closer together, but it also created distance between the sexes. ■

#### Excerpts from the paper delivered by Michelle PERROT

Source: *La lettre, no. 39, March 2015*

(1) Clémantine Vidal-Naquet, *Couples dans la grande guerre*, Les Belles Lettres, 2014, p. 325 sq. (2) *Ibid.*, p. 360. (3) Alain Corbin, *L'harmonie des plaisirs. Les manières de jouir du siècle des Lumières à l'avènement de la sexologie*, Perrin, 2008. (4) see Stéphane Audoin-Rouzeau, *L'Enfant de l'ennemi*, Paris, Aubier, 1995; Raphaëlle Branche and Fabrice Virgili (eds.), *Viols en temps de guerre*, Payot, 2011. (5) Jean-Yves Le Naour detailed all the aspects of this history in *Misères et tourments de la chair* (Aubier, 2002). (6) see Jean-Yves Le Naour, *op.cit.*, p. 217.

(7) In arms factories, especially under the impetus of the Minister of War Albert Thomas, breastfeeding rooms were set up and factory superintendents were appointed to ensure working conditions were respected.

The full paper is available at [www.college-de-france.fr/  
site/colloque-2014/symposium-2014-10-17-17h00.htm](http://www.college-de-france.fr/site/colloque-2014/symposium-2014-10-17-17h00.htm)

Michelle PERROT

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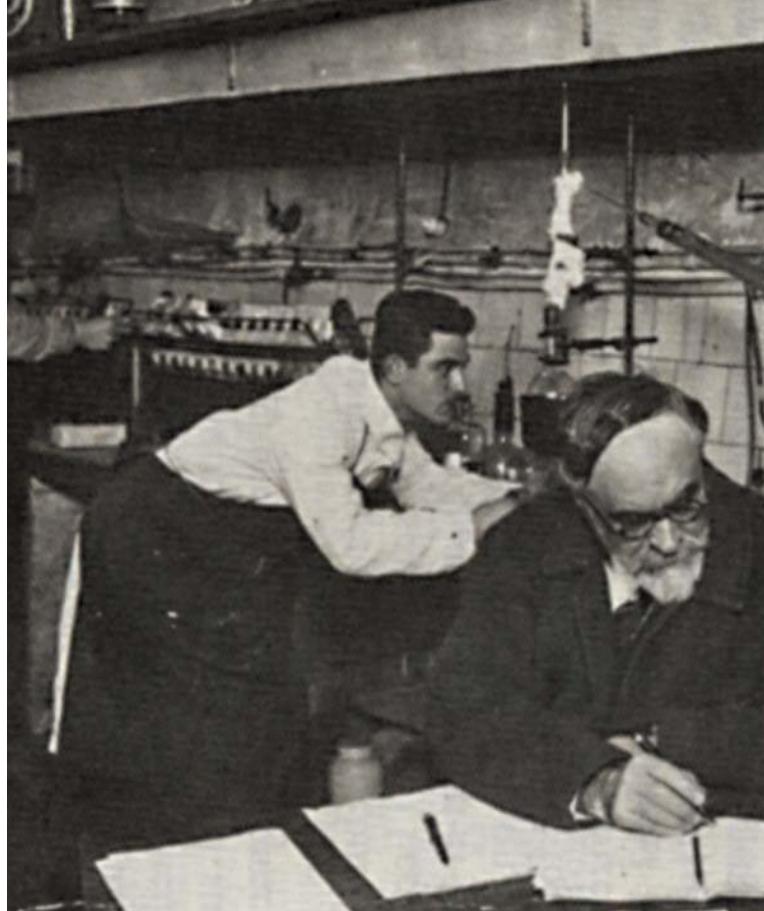
# Charles Moureu: From the Collège de France to poison gases

**As a professor of chemistry at the Collège de France, it is with much emotion and respect that I recall Charles Moureu's name, even though it is associated with the production of chemical weapons and poison gases during the First World War. It is important to bear in mind the violence of the historical conditions in which French intellectuals worked at the time.**

Patriotic and nationalistic feelings were exacerbated and played a crucial role in their professional and political choices. What makes me turn to Charles Moureu is that he was the only professor appointed at the Collège de France during the four years of the conflict.

This was in 1917, when he was 54. He was appointed to the prestigious Chair of Organic Chemistry, succeeding Émile Jungfleisch, who was Marcellin Berthelot's successor. He deserved it. As an organic synthesis chemist elected to the French Academy of Sciences in 1911, he was renowned for his work not only on acrylic acid and its derivatives, but also on acetylenic compounds, phenolic compounds, especially natural products derived from plant essences, and rare gases (these gases are not toxic).

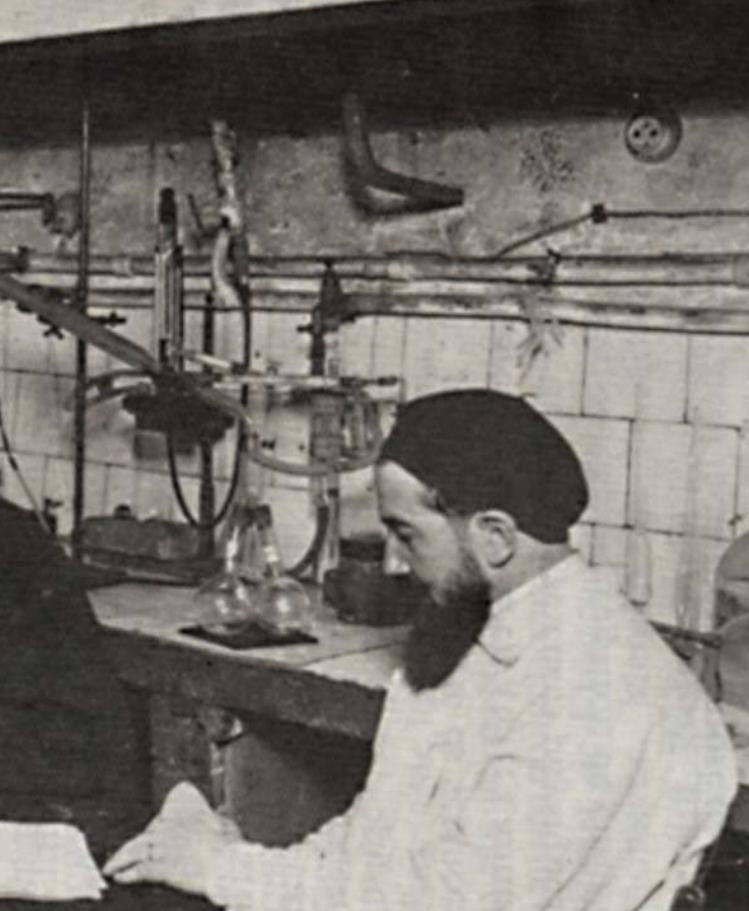
During those war years, Moureu and his student Charles Dufraisse worked on acrolein, a precursor of acrylic acid that he knew well. This is a compound with highly irritating and lacrimation vapours. He had known it since 1893, when he used this aldehyde to prepare acrylic acid. Acrolein was to be used as a poison gas. At the end of 1916, French artillery shells contained benzyl iodide



as well, which Moureu and Dufraisse also studied at the École Supérieure de Pharmacie where Moureu was appointed in 1907.

This research, which the war justified and which can now be considered unacceptable, led Moureu to a major discovery on a fundamental level that later resulted in applications of great importance for the well-being of humanity. This work, published in 1922 only, seven years before his death, had started in the midst of the war. Acrolein, developed by Moureu for chemical warfare, is an unstable compound which tends to polymerize when it comes into contact with air, and thus to lose its toxic properties. After the war, in his laboratory at the Collège de France, Moureu studied these processes and showed their very general nature. Most organic products degrade spontaneously, though at widely varying speeds, when they come into contact with air, following oxidation reactions due to the presence of oxygen in the air. Most of the time catalysts activate these reactions. This is the phenomenon called autoxidation.

In a way everything around us autoxidizes. For example, it is now accepted that humans' ageing is partly due to processes of autoxidation of biological molecules. In the life sciences and medicine, the expression "oxidative stress" is used to describe this set of natural processes to which all organisms living in an oxygenated atmosphere are subject. Moureu understood this process's origin and mechanisms, and identified catalysts triggering it. Above all, he found that some compounds, particularly phenolic compounds such as hydroquinone, which he studied extensively during that period, had the capacity to slow down or inhibit these reactions. In so doing he made a major discovery in the history of science, no doubt his most striking discovery: antioxidants, the current name for what Moureu called "antioxygens" at the time.



▶  
Profs. Charles Moureu  
and Charles Dufraisse  
in their laboratory in Paris

This discovery would surely have deserved the Nobel Prize, had Moureu's work, as I have already pointed out, not been tainted with the blood of soldiers asphyxiated by his molecules developed during wartime. These antioxidants are now used on a large scale as preservatives and to slow down the ageing, in other words the oxidation, of molecules and materials in the chemical, food and cosmetic industries. Many medicines are used for their antioxidant properties.

Living organisms themselves have elaborated complex antioxidant regulatory mechanisms allowing them to live in the Earth's oxygenated atmosphere, and specifically antioxidant molecules such as Vitamin C and Vitamin E or ubiquinone, a membrane antioxidant on which we are currently working in my laboratory. From chemical weapons to antioxidants, the paradox between science and what humans make of it is once again fully apparent. ■

**Excerpts from the paper delivered  
by Prof. Marc FONTECAVE**

Source: *La lettre*, no. 39, March 2015

▶ The full paper is available at [www.college-de-france.fr/  
site/colloque-2014/symposium-2014-10-16-14h00.htm](http://www.college-de-france.fr/site/colloque-2014/symposium-2014-10-16-14h00.htm)

## Programme

### Opening Address

Serge Haroche, *Collège de France*

### Vienna before 1914 and after 1918:

#### Continuities and Breaks

Anton Zeilinger, *University of Vienna*

### Berlin after 1918: A problematic modernity

Céline Trautmann-Waller, *Sorbonne Nouvelle University - Paris 3*

### The Consequences of the War for University Life in Europe

Jürgen von Ungern-Sternberg, *University of Basel*

### Orientalists: Adventurers, experts and diplomats

Henry Laurens, *Collège de France*

### Charles Moureu: From the Collège de France to poison gases

Marc Fontecave, *Collège de France*

### A Turning Point in Relations between Mathematics and Physics

Françoise Balibar, *Paris Diderot University - Paris 7*

### War, Literature and Democracy

Antoine Compagnon, *Collège de France*

### Language, Logic and Philosophy

Jacques Bouveresse, *Collège de France*

### French Philosophers Faced with the War: Politics, morality and philosophy

Claudine Tiercelin, *Collège de France*

### Picasso, Duchamp, Kandinsky: The 20th-century workshop

Roland Recht, *Collège de France*

### War and Cinema under the Weimar Republic

Olivier Agard, *Paris Sorbonne University - Paris 4*

### Superficial and Profound Breaks in Music

Makis Solomos, *University Paris 8 Vincennes*

### The Emergence of Psychoanalysis: A fact of civilization?

Roland Gori, *University of Aix-Marseille*

### A Great-War Effect on French Psychiatry?

Isabelle von Buelzingsloewen, *Université Lumière Lyon 2*

### Wars and the Construction of the State: The example of education

Philippe Aghion, *Harvard University*

### The Leader: Transnational study of a shared object

Yves Cohen, *EHESS*

### The War Transformed Love

Michelle Perrot, *Paris Diderot University - Paris 7*

**Prof. Marc FONTECAVE**  
Chemistry of Biological Processes



**VISITING PROFESSORS**  
 LECTURES BY PROF. YOICHI HIGUCHI  
 JUNE 2014

# Overview of the Notion of the Individual in Modern Japan

**The keyword of the lectures I delivered at the Collège de France in June 2014 is a notion that has haunted Japanese intellectuals since the mid-nineteenth century, and continues to do so today: that of the *individual*.**

It seems to me particularly timely and necessary to deal with that theme, since Japanese society is currently freeing itself from the obsession that individuals are lacking. Moreover, in the eyes of a constitutionalist like me, the notion of the individual relates to the fate of democracy, understood not only as a way of deciding in the name of the *demos*, but above all as a civilization that has to manage the *res publica* while respecting the individual's value and dignity. The relationship between modernization and democracy thus defined – what I would call *constitutionalism* – is one of the crucial problems of our time.

The issue is not limited to the Far Eastern archipelago. Belief in the individual, which is also linked to the universalist philosophy of the Enlightenment, seems largely outdated in Western intellectual circles, which tend to argue for the end of modernity. That is why, in my contribution to the World Congress on the Bicentenary of the French Revolution, I dared to subtitle my presentation as: "The deeper meaning of 1789 for the development of Western constitutionalism in the world". In this context, in his closing address, the great historian Maurice Agulhon answered me: "This surely ought to encourage the French, at least those who have remained friends of the law and freedom." But the situation is not simple outside the West either, as it is not simply a matter of those accusing Western cultural imperialism. What was and is now Japan's position in this *chassé-croisé* picture? What is the Far Eastern archipelago's geo-cultural position? This is the question I tried to answer.

There are too many cases of "modernization" taking place despite a lack of constitutionalism, or even *because* of this evident lack. Defining democracy as "the mode of political organization of an individualist civilization", the constitutionalist Bernard Chantebout identifies three types of reactions, by extra-Western civilizations, to democracy understood in this way. Alongside "refusal" and "failure", he described the Japanese experience as a "synthesis of democracy and tradition". Without falling into the trap of a certain patriotism, I for my part have a rather positive assessment of

"post-war democracy" under the 1946 constitution, which proclaimed respect of the individual and of certain honourable achievements of "Taisho democracy", including under the 1889 imperial constitution. Still, we need to ask ourselves whether the term "synthesis" is relevant here.

Briefly recalling the country's tormented modern history, I referred to the standpoints of representative intellectuals, who are caught in the continual rivalry between that which is open to the universal and that which is characterized by a certain "Japaneity". Following a tragic adventure, and finally freed of the constraint of the military-theocratic power of 1935-1945, young intellectuals tried to learn from their painful experiences.

Masao Maruyama (a historian of political ideas, 1914-1996) distinguished between two kinds of freedom, the simply liberating freedom of desire and the creative freedom of norms, to reveal a severe lack of the latter in Japan's cultural tradition. He warned that "post-war democracy" would not be feasible if it was not rooted in that freedom. The notion of *basso ostinato*, which he proposed, helps us to understand the difficulty we have experienced in seeing individualist voluntarism taking root. The persistence of a deep voice, inherent to the climate of this culture, metamorphoses the dominant melody, which comes from the outside. This may be what makes the charm of Japanese culture (see the example of Buddhism since the seventh century). But there was also the risk of ending up crushed by the *basso ostinato* which became deafening (the constitutionalism of the 1930s). Shuichi Kato (a writer and critic, 1919-2008), to whom Nobutaka Miura devoted most of his lecture at the Collège de France in March 2013, developed the idea of a "mixed" or "hybrid" culture to overcome the idea – erroneous according to him – that modernization amounts to Westernization. He saw this as a necessary challenge never again to repeat the terrible isolation of intellectuals, who ultimately had not been able to prevent the great disaster.

Will the individual manage to gain ground in this small corner of north-east Asia? It is very difficult at present to give a precise answer to that question. ■

**Yoichi HIGUCHI**

Source: *La lettre*, no. 39, March 2015

- Prof. Yoichi Higuchi was invited by the Faculty, on Prof. Anne Cheng's suggestion.
- Videos of these lectures are available at [www.college-de-france.fr](http://www.college-de-france.fr), on Prof. Anne Cheng's page.



**Yoichi HIGUCHI**  
 Professor of Constitutional  
 Law, member  
 of the Japan Academy

# The Rich Kurgans of the Ancient Bronze in Eastern Georgia

**The Ancient Bronze Age in the southern Caucasus is dated from between the second half of the fourth and the third millennium BCE. It is linked to the Kuro-Aras culture. This ancient farming culture extended all the way to eastern Anatolia, north-western Iran and Syria-Palestine.**

During the second half of the third millennium BCE, in the central part of the southern Caucasus, in other words in eastern Georgia, rich inhumations appeared under large kurgans. Two groups have been distinguished, the Martkopi and the Bedeni. The appearance of inhumations under kurgans is linked to the activity of nomadic groups from the Eurasian steppes: in the third millennium BCE, peoples from the steppes of the north began infiltrating the farming cultures of central Asia, the southern Caucasus and the Balkans, with various degrees of intensity.

In the southern Caucasus, the appearance of these new peoples led to significant transformations of the local culture, though there was no mass migration. It is most likely that this concerned small groups that took control of the war and political spheres while the local traditions of the material culture were preserved. As yet, this period of the Ancient Bronze kurgans has received little attention. In Georgia, some remains were excavated during the 1960s and the 1980s, and have been interpreted in various ways. The recent discovery of new, more monumental kurgans is therefore important.

Archaeological excavations carried out over the last few years in Georgia have brought to light many interesting sites from different periods. The most significant ones include those of the mission of the Archaeological Centre of the National Museum of Georgia, undertaken under the author's supervision. These are the sites of the Ananauri 3 Great Kurgan in the Lagodekhi district, on the left bank of the Alazani River, excavated in 2012.

The kurgan's tumulus was 100 metres in diameter and 12 metres high. It was entirely made of earth but was covered by a layer of stones. Under the tumulus, at the centre, at the former level of the plain, an area made of two layers of 25 by 15 metre oak beams was discovered. It was covered by a 20 centimetre-thick layer of wood shavings and sprinkled with ochre. This served as a roof to the burial chamber. The latter, measuring 9 x 6.5 metres, was dug into the ground 2.25 metres deep and surrounded by logs. Its floor was also made of wood and three poles supported the roof.

Although the kurgan was pillaged a long time ago, probably soon after the inhumation, many exceptional finds were made: two wooden four-wheel carts, a wooden armchair, decorated pottery and wooden crockery, flint and obsidian arrowheads, jewellery made of gold, of semi-precious stones and of amber, and so on.

Owing to the region's microclimate, the organic material was exceptionally well preserved: leather and fabric objects, wickerwork, nuts, sweet chestnuts and even forest berries were found. These unique data revealed during the excavation are currently under study in laboratories. They are significantly enriching our knowledge of this Ancient Bronze period in the Caucasus. The Ananauri 3 kurgan, which dates back to the second half of the third millennium BCE, is now one of the major sites of this period. ■

**Zurab MAKHARADZE**

Source: *La lettre*, no. 38, June 2014

- M. Zurab Makharadze was invited by the Faculty, on Prof. Franz Grenet's suggestion.
- A video of the lecture is available at [www.college-de-france.fr](http://www.college-de-france.fr), on Prof. Frantz Grenet's page.

**Zurab MAKHARADZE**  
 Director of the Georgian National Museum Otar Lordkipanidze Archaeology Research Centre.



VISITING PROFESSORS  
LECTURES BY PROF. FRÉDÉRIC LAUGRAND  
APRIL-MAY 2014

# Ontology on Ice: The Inuit of the central Canadian Arctic and their animals

**The two lectures at the Collège de France were delivered on 30 April and 7 May 2014, as part of a research project on Inuit cosmology and on these Northern Canadian populations' relationships with the animals around them.**

The research is conducted from a perspective that is both comparative and ethno-historical – respectively taking into account socio-cultural variations on an intra-regional scale, and the multiple transformations that have marked these societies since the end of the nineteenth century, particularly sedentarization, Christianization, and the advent of modernity and the State. It is based not only on written sources but also,

and especially, on oral sources that have been collected during numerous knowledge transmission workshops with elders and youth from different Nunavut villages. These activities have been carried out for the last twenty years in collaboration with Jarich Oosten, emeritus professor at the University of Leiden.

## Predators and preys, or how the Inuit and their animals challenge our ontological approaches

Over the last three decades, the anthropology of nature and that of ontologies and cosmologies have undergone considerable developments, providing new perspectives on many phenomena, beliefs and experiences throughout the world. Based on



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diverse ethnographic material drawn from our research with the Inuit, the first presentation put into perspective and tested several of these theoretical approaches – those of Tim Ingold, Philippe Descola, Roberte Hamayon, Ann Fienup-Riordan, Bruno Latour, and Eduardo Viveiros de Castro – against contemporary conceptions of the Nunavut and Nunavik Inuit.

In these regions of the Canadian Arctic, many conflicts still regularly occur between hunters, environmentalists, biologists, and politicians. These profound divergences show the Inuit's attachment to hunting, as well as the resilience of Nordic traditions within modernity. The same divergences also force anthropologists to clarify some apparent paradoxes, such as these hunters' current preference for the "Biblical environmentalism" of evangelical groups, as opposed to environmentalists' environmentalism. On a theoretical level, while contemporary ontological anthropology certainly sheds light on several fundamental aspects of these hunters' thinking, traditions and customs, it does not always do justice to the complexity of Inuit perspectives, according to which humans and animals are vital to each other – but stand in relation to one another in an irreversible position, with the former remaining predators and the latter anonymous preys. From a naturalist perspective, the question arises as to whether Inuit animism is not distorted by the excessive humanization of animals, whereas these hunters actually stress another hierarchy, in which animals are considered as prey, even if the myths show that they interact and share many commonalities with humans.

## The revival of whale hunting and the fear of small beings in the central Canadian Arctic

In the second lecture, we described and analysed the revival of whale hunting since the mid-1990s, and the fear that the central Arctic Inuit still harbour of *qupirruiit* (small beings), which abound in these regions. Regarding whale hunting, we proceeded to a detailed examination of the animal imitation phenomenon, and posited that it offered a way into the complexity of hunting, providing a different perspective on the relationship between a predator and its prey, and facilitating the link between ontology and shamanism.

In an Inuit context, this shaman's imitation of an animal can be reversed, as is seen in certain hunting practices which are explained by the communication that is always established between the hunter and his prey. We here argue that most gestures associated with this logic of imitation actually stem more from one of prefiguration, as the gesture of pointing a finger towards the whale illustrates so well. From this perspective, humans' actions, particularly those of women, are designed to seduce the whale. When the women lie down while their husbands go hunting, they invite the whale to become passive and to stay still so that the hunters can harpoon them. The hunters and their wives thus endeavour to deceive, or better, manipulate their prey by encouraging it to imitate humans, and not the other way around. These gestures therefore relate to a sort of prefiguration,

defined as a form of non-verbal communication. This is seen as the ideal option for the hunters, who then no longer feel as though they are forcing their prey to give itself up, but on the contrary as if it happily offers itself to them. In other words, they obtain their prey's consent through manipulation. It will consequently have to be a cause for collective rejoicing. This aspect is still crucial to whale hunting. The hunter finally assumes his position as "constrained" predator, as Shaman Ava once stated.

"Small beings", which abound in the Arctic regions and have yet to receive the attention they deserve, play a fundamental role in the initiation, construction and transformation of the shamanic body. Like many other peoples, the Inuit seek to capture a part of the vital force of the *qupirruiit* by using them in amulets, for example, or allowing lice to regenerate their blood. They however avoid prolonged and uncontrolled contact with these bugs, at the risk of being themselves transformed and of moving to a world outside of time and the rules it imposes on humans. We thus saw that these small beings are especially known and dreaded for their capacity to devour and transform humans. The Inuit, including artists, remain fascinated with their power of constant rebirth, and their capacity to move from life to death, in other words to link the world of the living with that of the dead.

In short, for the Inuit, both the biggest prey and the tiniest bugs are perceived on different scales, in such a way that the smallest can become the most threatening for humans. While animism and perspectivism afford an adequate grasp of these phenomena, they also remain closely linked with shamanic conceptions and practices. Far from having disappeared, these conceptions and understandings are now intertwined with Christianity. This begs the question of how to grasp these hybrid cosmologies. How do the cultural logics involved differ from one another and how are they combined? ■

**Frédéric LAUGRAND**

Source: *La lettre*, no. 39, March 2015

- This research gave rise to a publication: Frédéric Laugrand and Jarich Oosten, *Hunters, Predators and Prey. Inuit Perceptions of Animals* (Oxford, New York: Berghahn Books, 2014).
- Prof. Frédéric Laugrand was invited by the Faculty, on Prof. Philippe Descola's suggestion.
- Videos of these lectures are available at [www.college-de-france.fr](http://www.college-de-france.fr), on Prof. Philippe Descola's page.

**Frédéric LAUGRAND**

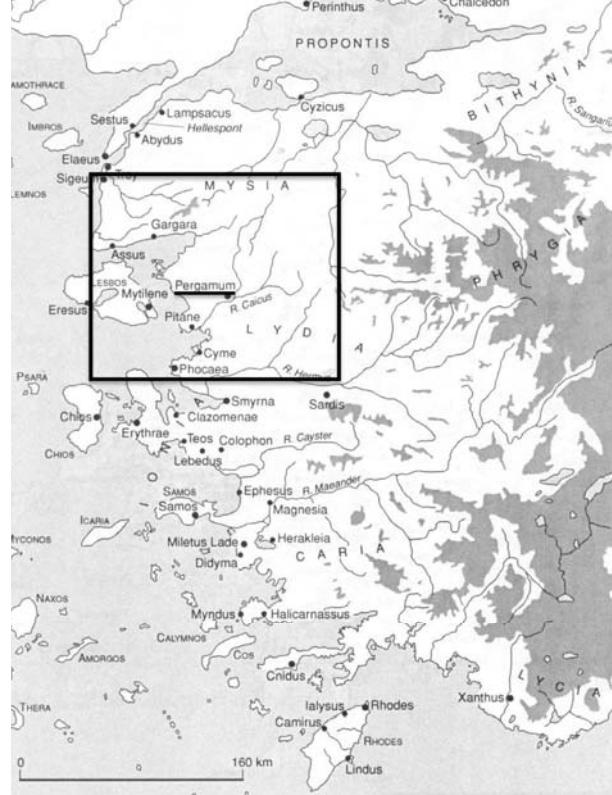
Professor,  
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VISITING PROFESSORS  
LECTURES BY PROF. HELMUT MÜLLER  
OCTOBER 2013

# Hellenistic and Roman Pergamon

## Five centuries of history illuminated by inscriptions



Pergamon's location in Asia Minor

Last autumn Prof. Helmut Müller (from Munich), a recognized specialist on Pergamon epigraphy and on the history of Greco-Roman Asia Minor in general, delivered four lectures at the Collège de France. He provided extensive insight into the contribution of a set of inscriptions – several of which are new and hitherto unknown – on the singular history of this city of Western Anatolia. From the mid-third century BCE, Pergamon was to become the capital of the powerful Attalid kings and later, during the High Empire, remained one of the metropolises of the Roman province of Asia.

Thus, regarding the early days of the city – at the time when it was still in the hands of Greek dynasts controlled by the King of Persia –, the epitaph of a man from Chalcis in Euboea found in the vicinity of the city sheds light on a passage in Xenophon's *Anabasis* on the presence of a Euboean ruling family in 399 BCE. Much later inscriptions also prove valuable in this respect: a summary of the history of Pergamon written in the 2nd century CE, for example, reveals the two successive transfers (from the acropolis to the plain, and then the other way around) imposed on the local population by the Persians, along with the appearance of the first political bodies characteristic of a Greek city.

### The Hellenistic period

The crucial event was then the arrival of Alexander, King of Macedonia, in Asia in the autumn of 334 BCE. This takeover, as well as the conqueror's life, are attested to by the long (unlimited) land lease discovered in the lower valley of the Caicus river, therefore near Pergamon, bearing witness to Macedonian settlers occupying the country. The subsequent split occurs with the establishment, in the city, of Philetaerus (283-263 BCE), who was to become the founder of the Attalid dynasty. His attitude towards neighbouring cities can be gleaned from a decree by Cyme of Aeolis that was recently published. His successor, Eumenes (I), inaugurated a new chapter in the

dynasty's history when he managed to get rid of the suzerainty of the Seleucid kings. The deal this quasi king had to make with his mercenaries nevertheless reveals just how precarious his domination still was. One of his letters also sheds light on his position in relation to the political authorities of the city. After a victory over the Galatia – a people of Celtic origin settled in Asia Minor – his successor Attalus I was able to proclaim himself king. Later, he formed an alliance with the Romans that would prove decisive when he fought King Philip V in the first two Macedonian wars (212-197). The kingdom however only reached its zenith with his son, Eumenes II (197-158), who took advantage of the capitulation of the Seleucid King Antiochus III to the Romans in 190, to expand considerably the kingdom of Pergamon. He successfully annexed most Seleucid possessions, allowing the Attalid State to become a great power on a Mediterranean scale, while on a cultural level the city of Pergamon joined the ranks of the other Hellenistic metropolises (as evidenced, in urban planning, by the famous Astynomoi Law). The complexity of the civil and military administration of this vast kingdom transpires through several newfound documents, dated from the last decade of the reign of Eumenes II.

The last prince of the dynasty, Attalus III (138-133), the son of King Eumenes II and successor of Attalus II (158-138), has been mistreated by the literary tradition. The epigraphy shows that the Pergamon population actually continued to honour him

even after his death. Unexpectedly, he left his kingdom to the Romans in his will, while Pergamon and most of the old cities of the Aegean coast were declared free. However the Romans had to wage a war for over four years (133-129) before they could lay hands on this legacy, as an illegitimate son of Eumenes II, Aristonikos (under the name of King Eumenes III), claimed domination of the kingdom. A growing number of documents tell us that he managed to rally the military colonies and inland cities of the kingdom against those of the coast – including the city of Pergamon –, which received support from the Romans. Yet Aristonikos failed to seize the former capital, probably because emergency measures were taken to integrate previously excluded residents as citizens.

### The Roman period

Following Rome's victory, the city was declared free – in keeping with the will of Attalus III – and thus escaped the control of the governor of the province of Asia created in 129 BCE. The new elite of the city of Pergamon concentrated its energy on training exemplary citizens, as many decrees providing a wealth of information on life at the gymnasium attest. Yet in 88 BCE most of the population rallied to Mithridates VI, King of Pontus, and took part in the massacre of the Romans settled in the city. Defeated by Sulla, the city lost its special status and, like most other Asian cities, was subjected to ruinous taxes. A few benefactors, such as the famous Diodoros Pasparos, nevertheless managed to obtain partial tax relief and maintain the smooth running of the gymnasium, after costly missions to the Roman authorities. Only Mithridates, son of Menodotus – who enjoyed Caesar's trust – successfully recovered immunity.

After defeating his opponents, Octavius – the future Augustus – allowed the umbrella body of the cities of the province of Asia to set up the common worship centre of the Emperor and Rome in Pergamon (29 BCE). From this date, which inaugurated the principate, Pergamon's main objective was to maintain, or to restore in some instances, its status as one of the great cities of Asia. Under Trajan, the city once again managed to surpass its rivals when it obtained the privilege of a second temple of the

imperial cult with the erection of the *Trajanum*. But Hadrian unexpectedly vetoed the construction of a third temple, a project that was the city's last attempt to get the better of its old rivals, Ephesus and Smyrna. Never again was Pergamon to recover its lost pre-eminence within the community of Asian cities. ■

**Helmut MÜLLER**

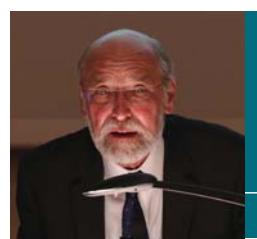
Source: *La lettre*, no. 38, June 2014



Letter from Trajan

- ▶ • Prof. Helmut Müller was invited by the Faculty, on Prof. Denis Knoepfler's suggestion.
- Videos of these lectures are available at [www.college-de-france.fr](http://www.college-de-france.fr), on Denis Knoepfler's page.

**Helmut MÜLLER**  
Emeritus Researcher  
at the Kommission für  
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**VISITING PROFESSORS**  
 LECTURE BY PROF. GLEN W. BOWERSOCK  
 SEPTEMBER 2013

## Michonis Lecture

# Pagan Angels in Late Antiquity

**The pre-Islamic Byzantine world experienced numerous paganisms, both polytheistic and, in view of their gods' hierarchy, occasionally quasi-monotheistic.**

In the Quran, Prophet Muhammad called *mushrikūn* those who shared their gods and had to be pagans, in some or other form. Historians studying the ideas of these *mushrikūn* have access to accounts on the angels to whom pagans appealed for heavenly intercession to help them and reveal heaven's invisible operations. The name of these Late Antiquity pagan angels derives from the Hebrew *mal'ak* in the Bible, which became *angelos* or messenger in the Septuagint. Muhammad considered himself a *rasul* (messenger) of Islam in pagan Arabia, where *malak* (without an alif) was the Arabic word for angel. The Prophet was well aware that the Arabs around him expected angels to confirm his message but he had not seen any. Muhammad presented himself only as a *rasūl*, not

### *The Michonis Foundation collection*

By decree on 10 March 1903, M. G. Michonis bequeathed a sum to the Collège de France to be used, "whenever possible, for a foreign scholar or thinker appointed by the professors or the Administrator of the Collège de France and who, circumstances permitting, will one in three times be a philosopher or a historian of religious sciences, to give a series of lectures". The execution of M. Michonis' will began in 1905. In 2013, Glen W. Bowerstock of the Institute for Advanced Study (Princeton) and of the Académie des Inscriptions et Belles-Lettres was invited to the Collège de France by Professors John Scheid, Denis Knoepfler and Michel Zink. On 30 September 2013, he delivered a lecture titled "Pagan Angels in Late Antiquity".

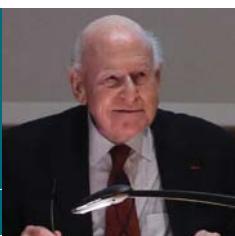
as a *malak*. In Greek, such a messenger was no longer called *angelos*, as other terms had replaced this ancient word, for example *apostolos* among Greek-speaking Christians and *nuntius* in Latin, where *angelus* only meant angel. What is striking about these title transitions is the use of the words *angelos* and *angelus* as epithets of pagan gods. These are angel-gods seen in the epigraphy in Lebanon, Jordan and Asia Minor, and in Latin in western Italy and in Romania. The angel-gods suggest that the traditional interpretation of a divine name, like Malakbēl in Palmyra, is best explained as Angel-Bêl rather than Angel of Bêl.

A coin from Al-Ji near Petra depicts the angel-god Idarouma, one hand raised, who received a Hauranese dedication in Sammet el Baradan. The inscription specifies that the dedication was made to Ilaalge, god of Gaia (Al-Ji), and his angel Idarouma. The image of this angel with a raised hand on a coin, where usually only gods were depicted, proves that this is an angel-god. It can be compared to the Theion Angelos (Theion Angelikon) of Caria in Asia Minor. The new, increasingly popular perspective, whereby pagan angels and even angel-gods are minor divinities at the service of a single great god – and consequently that Late Antiquity paganism was just a pagan monotheism – is still unfounded. The Quran admits no such supposition, and the Quranic goddesses of the pre-Islamic pantheon (al Lat, al Uzza, al Manat) can in no way be identified as Allah's daughters. The Late Antiquity pagans who sided against the Prophet were entirely polytheistic. ■

**Glen BOWERSOCK**

Source: *La lettre*, no. 38, June 2014

An audio recording of the lecture is available at  
[www.college-de-france.fr](http://www.college-de-france.fr), on Prof. John Scheid's page.



**Glen BOWERSOCK**  
 Emeritus Professor of Ancient History, Institute for Advanced Study, Princeton, Associate member of the Académie des Inscriptions et Belles-Lettres

Interview published  
in *Le Point* on 1 April 2014

# Prof. Christine Petit is Bringing the Deaf out of the World of Silence

**Christine Petit's work on hearing and hereditary deafness, of major importance for hearing-impaired young people, should also improve the life of the elderly. The cochlea, the sensory organ of hearing, is virtually an open book for Christine Petit, professor at the Collège de France and the Institut Pasteur, and head of the INSERM Unit 1120 (Genetics and Physiology of Hearing). She is behind the discovery of a great number of genes responsible for deafness and associated faulty mechanisms, as well as the deciphering of this organ's functioning at molecular level.**



## What was the starting point for your work?

**Christine Petit** I was always interested in sensory perception and communication between individuals. After studying olfaction, I decided to focus on audition. At the time, we had knowledge on the functioning of the hearing system, particularly that of the cochlea, but no data to understand the molecular mechanisms of its development or functioning. This was due to the very small number of cells for each of the cellular types of which it is comprised. Upon reflection, it became clear that only the genetic approach, in other words searching for the genes whose deficiency causes deafness, could allow us to understand its functioning at cellular and molecular level. Unlike all the other approaches, its effectiveness was not contingent on the number of cells and molecules involved in the process we sought to explain.

## How did you progress in your area of expertise and with what results?

**C.P.** My team and I first resolved the different problems that prevented us from identifying the genes responsible for deafness in humans, by analysing very large families suffering from deafness, living in remote areas.

We now know barely one hundred genes involved in isolated deafness and about two hundred for deafness associated with other clinical signs (syndromic deafness). We thus broke down deafness into all these different forms. The next stage was to understand how, for each of them, the defective gene affects hearing. This could only be achieved using animal models of these forms of deafness: mice in which the same gene as the one responsible for deafness in humans is deactivated. Today, the different forms of deafness can be categorized into a few main pathogenic groups. In parallel, these data shed light on the cochlea's normal functioning.

We are now able to diagnose the genes responsible for deafness in a child or young adult, which allows us to ascertain the hereditary nature of this problem and thus to

inform families of the existence of a risk for future children. The advances made through the study of animal models of deafness have led to changes in the interpretation of certain audiometric tests commonly used. For each form of deafness whose gene has been identified, these models also make it possible to identify whether or not the use of hearing aids (conventional prostheses or cochlear implants) will be beneficial.

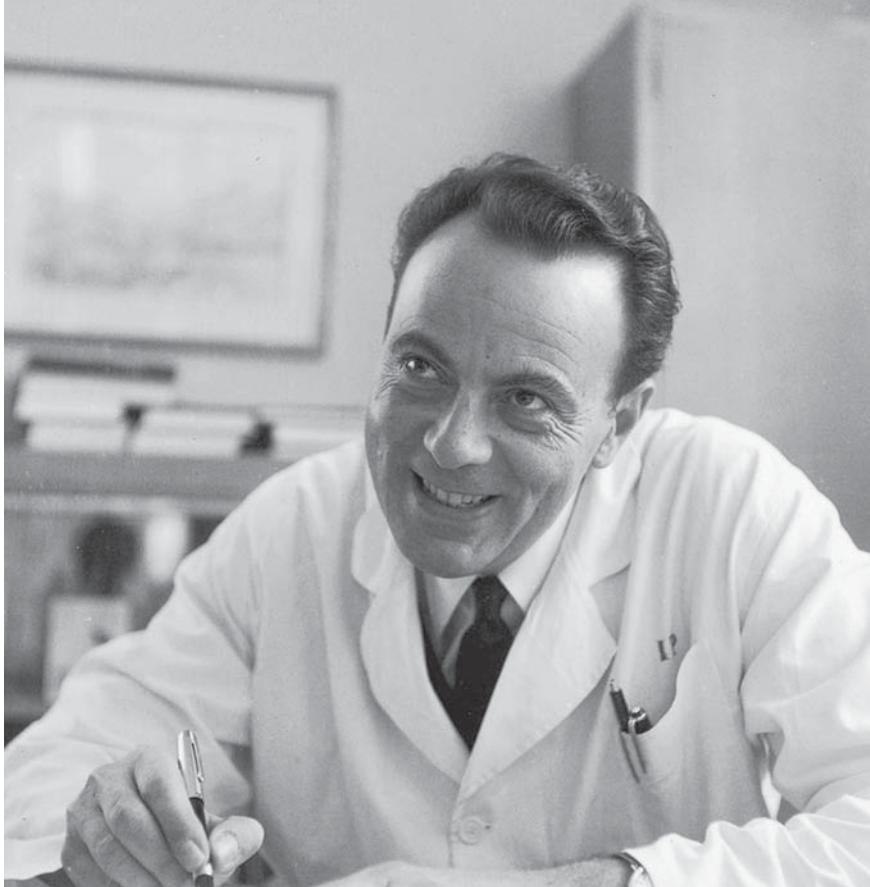
## What will you need in the future for research in your field to progress?

**C.P.** With regard to hearing impairments, we have yet to discover the genes of susceptibility to age-related sensorineural hearing loss, presbycusis, affecting 10 to 15% of the general population. As in the case of premature deafness, this is a prerequisite for us to understand the mechanisms and thus develop prevention and treatment tools tailored to each form. There is probably a large number of such forms. Research must also develop the currently fledgling knowledge of the processing of acoustic signals at brain level and of auditory perception. This is crucial for understanding tinnitus and hyperacusis. Finally, the time has come to develop therapeutic alternatives to hearing aids. While therapeutic advances are now a realistic objective, this hope must be associated with preventive measures against auditory stressors, primarily overexposure to noise. ■

**Interview by Olivia RECASENS published with the kind agreement of the magazine *Le Point***  
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**Prof. Christine PETIT**  
Genetics and Cellular  
Physiology





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# Tribute to François Jacob (1920-2013)

## Chair of Cell Genetics from 1964 to 1991

François Jacob, born in June 1920, was the only son of Simon Jacob and Thérèse Franck, both from Jewish families with strong though surprisingly different beliefs. François Jacob described his father as someone who combined religious practice with radical-socialist opinions, reconciling “a taste for tradition with the taste for revolution”.<sup>1</sup>

His mother, agnostic, even atheist, was politically far more conservative. François grew up with the affection and tenderness of this woman, who died in June 1940, “in time”, he wrote, “not to experience the horror, … the flight from the yellow star”.<sup>2</sup> But “his ideal, his model”, in his own words, was his maternal grandfather in Dijon, Albert Franck, for whom he claimed to have “some sort of adoration”.<sup>3</sup> Albert Franck, “the general”, as François Jacob called him, was the first Jew to reach the rank of lieutenant general. He made François Jacob both see that “the sky was empty” and understand that “there was an Earth to fill”.<sup>4</sup> As a child, François Jacob looked up to him to build himself “a coherent representation of the world”. His school years at the Lycée Carnot in Paris left him with a memory of the Republican school as an institution concerned not so much with teaching as with “subduing the youth, standardizing it, making them all fit the same mould”.<sup>5</sup> After his baccalaureate, drawn to surgery, he started studying medicine but his studies were soon interrupted by the war.

When François Jacob turned 20 on 17 June 1940, he was on the road fleeing Paris with three of his friends. That was when, travelling towards the South West of France,

he heard Pétain announce the armistice, which the General had asked for – “with honour and dignity” – in the words of his communiqué.<sup>6</sup> François Jacob refused submission outright. Determined to fight, he headed to Saint-Jean-de-Luz and the next day left for England with a friend. There, with a few thousand men, Free France was formed. Their strategy was to enter the war by relying on the African colonies. François Jacob asked to be appointed to the artillery; he was made to join the health service. On 1 September 1940 he left for Dakar, then continued on to Brazzaville, Libreville, and then to Fort-Archambault, where he was appointed to the Senegalese infantry regiment. From there he was sent to Mao, a large isolated town North of Lake Chad, to serve as a doctor – a sanction for refusing an appointment that would have removed him from the combat units. It was only in the summer of 1942 that he was allowed to join the troops heading towards Libya: Fort-Lamy, then the desert crossing to Fezzan and Tripoli – “a trek to the ends of the earth” for three thousand men “in an impossible desert”, he wrote.<sup>7</sup> Finally, he was sent to the South of Tunisia, where he endured days of uncertainty and nightmares in Ksar Rhilane, decisive days for the course of the war. His first combats were in Djebel Matleb, then in Djebel Garci, where he was wounded in May 1943. In April 1944 he left Casablanca for England. On 1 August, he landed in Normandy, on Utah Beach. Eight days later he was severely injured during an air raid. He was evacuated to Cherbourg and then to the Val de Grâce hospital in Paris where he spent six months, and later had to be hospitalized again.

As a “glorious casualty”, as he called himself<sup>8</sup>, another desert crossing awaited him. The consequences of his injuries put an end to his hopes of becoming a surgeon. What was he to do? Finish his medical studies “as fast as possible”, he wrote.<sup>9</sup> Certainly, but then what? He was adrift, caught in bitterness, loneliness and doubts about himself and his future. In 1947, during a stint at the Cabanel centre created by the army to produce antibiotics, he wrote a medical thesis on one of them, tyrothricin. The centre subsequently closed and the years went by. François Jacob gradually developed an interest for research in biology. He sensed a “promise of effervescence to come”, “at the interface between genetics, bacteriology and chemistry”.<sup>10</sup> He contacted the few research centres likely to host him, to no avail. As a last resort, he turned to the head of the Institut Pasteur, Prof. Tréfouël, who welcomed him and offered him a research grant. He just had to find a laboratory that would host him. François Jacob’s mind was made up, and nothing could change it: he wanted to join the laboratory headed by André Lwoff, where Jacques Monod was already working. André Lwoff’s successive refusals did nothing to shake his determination. François Jacob insisted, and André Lwoff eventually accepted him into his laboratory. He wrote of

François Jacob’s recruitment that while his “preparation for research was [...] certainly classical”, “energy, decisiveness, the spirit of sacrifice and enterprise, the refusal of defeat, and tenacity are vital qualities for a researcher”.<sup>11</sup> André Lwoff’s sudden change of mind was due to the discovery he had just made. After years of effort, he had successfully induced a prophage in lysogenic bacteria. A field of research was opened, and ... a new PhD student was welcome! After receiving scientific training from the Grand Cours of the Institut Pasteur and two science degrees, François Jacob was finally ready to start working. This was October 1950. Fifteen years later he opened his Nobel speech with these words: “I was fortunate to arrive at the right place at the right time. At the right place because, there in the attics of the Institut Pasteur, a new discipline was emerging in an atmosphere of enthusiasm, lucid critique, non-conformism and friendship. At the right time because biology was thriving, it was changing its ways of thinking, discovering new and simple material in microorganisms, and moving towards physics and chemistry. It was a rare moment when ignorance could become a virtue”. André Lwoff embraced the Darwinian and Mendelian theories, unlike many French biologists, who were more inclined towards heterodoxy. As for microbiology, it had still not been established in the higher education of Pasteur’s land. François Jacob started with a rigorous and systematic study of lysogenic bacteria. His focus was twofold: defining the conditions of induction of the production of the viruses, bacteriophages, which they host in the form of proviruses, called prophages; and understanding the latter’s nature and properties, as well as the basis of the immunity that their presence conferred on the lysogenic bacteria. He thus clarified the lysogeny phenomenon, the fickle nature of which even had scientists doubting its existence for a while. He turned it into a much broader subject of study (the nature of the relations between bacteria and their viruses), and sought to extend his conclusions to the viruses of complex plant and animal organisms. His unitary vision of life forms, which guided all his reflection, could already be found in the monograph *Les bactéries lysogènes et la notion de provirus* [Lysogenic Bacteria and the Proivirus Concept], a compilation of his PhD work, published in 1954. In the preface to this work, André Lwoff highlighted his “exceptional predisposition for research”; “Within two weeks, we knew we had recruited someone great” said his colleague Georges Cohen. “A good pal”, he added, “who liked to get on with people”. He was curious about the work carried out by the researchers around him, particularly Jacques Monod, and soon began collaborating with several colleagues.

From 1953, he started working with Elie Wollman, in a rare relationship of trust and friendship. Together, they studied bacterial conjugation, and very soon understood that this phenomenon was related to that of the phage cycle.

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Genetic material, the F factor, determines the mating type of the *Escherichia coli* bacterium. But this factor exists under two forms: one is free, and the other integrated into the bacterial chromosome. François Jacob and Elie Wollman discovered that this phenomenon could be used to map bacteria's genes. Their order and distance on the bacterial chromosome could be deduced from the oriented transfer of the chromosome, at a constant speed, from a male donor bacterium to a female recipient bacterium, operated from one of the extremities of the integrated F factor. All the genetic criteria transferred from one bacterium to the other were linked: the bacterial chromosome was therefore circular. Elie Wollman flew off to the United States.

François Jacob's collaboration with Jacques Monod, which he later called "the great collaboration", began in 1958.<sup>12</sup> Jacques was ten years his senior. Agnès Ullmann, a contemporary witness, commented on the "total complementarity between them: François mastered genetics, Jacques biochemistry ... Jacques Monod confided a lot, François Jacob little. They addressed each other with the formal "vous". François Jacob was an early riser, Jacques Monod not so much. Both whistled very well, Brahms or Mozart for François, Bach for Jacques: we knew who was walking in the corridor ... No shadow was ever cast on their immense scientific connivance. They were constantly provoking each other and, with almost unimaginable excitement, always expressed the irrepressible need to compare their ideas several times a day. They shared the implacable desire to understand and the fear of mistakes ... They were so different and yet so similar" – "resistant from the outside, resistant from the inside", with the mutual incomprehension to which these two forms of engagement led.

Together, they designed the "PaJaMo" experiment: "Pa" for Pardee, a US researcher on a sabbatical, "Ja" for Jacob, and "Mo" for Monod. Soon renamed "PY JA MA", it was to become one of the most famous experiments in biology. The aim was to analyze the respective roles of the gene products of the *Escherichia coli* bacterium's lactose degradation system, using the mapping by conjugation tool that had been developed and the numerous mutants isolated for each of these genes. Jacques Monod's interest in the lactose system was owed to its inducible nature, actually common to several bacterial enzymatic synthesis systems. The lactose degradation enzyme, beta-galactosidase, is not found in bacteria, but is rapidly expressed after adding lactose to the culture medium. For a long time, Jacques Monod had sought to understand this induction mechanism. The heuristic power of the PY JA MA experiment, both remarkably well constructed

and beautifully aesthetic, was considerable. Its results overturned established ideas by explaining an enzyme induction through a mechanism founded on repression: a cytoplasmic material coded by a gene that was independent from that of beta-galactosidase inhibited the latter's expression, and this repressor was itself inhibited by the lactose. This was a striking discovery, which revealed the existence of two types of gene, one coding structural proteins like beta-galactosidase, and the other controlling the expression of the former. Moreover, this experiment revealed the existence of an operator region upstream from the genes thus regulated, to which the repressor had to attach. During this whole period, François Jacob proved to be "an incredible strategist in the design of experiments", as François Gros put it. At a remarkable speed and with reliable judgment, he would gather the necessary tools and define the experimental conditions to test the hypotheses formulated.

A wave of intuitions and discoveries ensued. In late July 1958, François Jacob was at the cinema, watching "a movie of no great interest. The shadows moved about onscreen", when suddenly, "it was as though a line of fire cut through the darkness", it was "the glare of evidence", in his own words:<sup>13</sup> the two experimental models he was studying, lysogeny and the lactose system, follow the same molecular mechanism. A gene synthesizes a repressor, which blocks the expression of other genes. This was a dazzling and genius intuition, which was later expressed through the elegant metaphor of "night science" and its companion "day science"<sup>14</sup>, the workshop of possibility in the case of the former and the sifting of rationality in the latter. François Jacob never tired of playing on words. His imagination was fuelled by the power of verbal evocation and meaning, which he expressed metaphorically. By placing subjects of reflection at a distance, by changing their meaning, metaphors afforded the biologist's striking intuition the conditions for the elaboration of new possibilities.

François Jacob easily convinced Jacques Monod of this obvious fact, which he had discovered while preparing the Harvey Lecture he had to deliver in September of that year. However, the interpretation of the two systems was halted by a missing piece, an unstable intermediary between DNA and protein synthesis, a cytoplasmic substance called "X". During a meeting between François Jacob, Sydney Brenner and Francis Crick, the latter two concluded that this substance X could only be an RNA. Sydney Brenner and François Jacob demonstrated this independently in Matthew Meselson's laboratory, as did François Gros and Walter Gilbert in Jim Watson's laboratory. This RNA becomes messenger. The model was thus complete: regulator genes that synthesized

a still enigmatic repressor, structure genes, an operator site to which the repressor attached, mRNA, an operon, etc. This whole molecular orchestration was completed on Christmas eve 1960, only ten years after François Jacob had entered André Lwoff's laboratory.

Seven years after the structure of DNA had been revealed, this discovery was a real conceptual breakthrough, which moreover was unforeseen. It was to enrich all of biology, both in its ways of thinking and in its methods, through the development of molecular biology. The article presenting the model indicated the expected scope of these advances. It ended by suggesting that the concept be extended to mammals, arguing that regulatory genes were behind cellular differentiation, that they allowed the genome to express only part of its potentialities, and that they could also explain the cell disorders of carcinogenesis.

In December 1965, the Physiology or Medicine Nobel Prize was awarded to François Jacob, André Lwoff and Jacques Monod, "for their discoveries concerning genetic control of enzyme and virus synthesis". Six months earlier, François Jacob had become a professor at the Collège de France, where he held the Chair of Cell Genetics. For quarter of a century, his critical mind enlightened the work of biology "in the making". His lectures were the fruit of long preparation in the loft of his Mouans-Sartoux house near Nice. All of them were written out in full.

François Jacob pursued his research in the microbial field until the late 1960s. He studied the replication of episomes, particularly of the F factor, and that of the phage lambda, as well as the division of the bacterial cell. He became increasingly interested in cell membranes, which were now central to his reflection. The Jacques-François duo began to drift apart, with neither of them showing much enthusiasm about the other's work. According to their colleagues, "François Jacob did not like *Le hasard et la nécessité* [Chance and Necessity]", written by Jacques Monod. "He did not share the vision of Judeo-Christianity developed therein, and the idea that science alone could define ethics". As for Jacques Monod, he was hardly interested in François Jacob's *La logique du vivant: une histoire de l'hérédité* [The Logic of Life: A History of Heredity]. They nevertheless continued to find common ground in certain social and political issues.

At the turn of the 1970s, many pioneers of molecular biology were drawn to the study of higher organisms. Once again, François Jacob sensed a budding field of research, that of early embryonic development. Convinced that the principles of the functioning of the bacterial genome must apply to

higher organisms and account for their development and for their cell differentiation, he gave up his precious collection of hundreds of bacterial *Escherichia coli* mutants. He hesitated over the animal model to study, fully aware of just how critical that choice was. For a moment he considered the nematode, but Sydney Brenner beat him to it. Finally, he opted for the mouse, a model which, in his eyes, combined many advantages. Teratocarcinoma cell lines, germ-line tumours capable of differentiating themselves into a variety of cell types, could be cultivated. They offered the possibility of identifying markers of various stages of the differentiation process, the relevance of which could then be tested in mice embryos; they allowed for a bio-chemical approach.

The genetic component crucial to the project was also present: mutant mice affected in their early embryonic development had been described. François Jacob proposed the creation of a mouse institute, an idea that was not well received by his biologist colleagues. The project never materialized but this new scientific objective was nonetheless thrilling. Still, it took François Jacob considerable courage to start again from scratch, with biological material that was totally foreign to him. While challenges never scared this man of tremendous drive and restless impatience for experimental results, the change in the timeframe of the experiments, from the fast pace of bacterial genetics to the slow one of the mouse, was a harsh test. The years from 1970 to 1980 were particularly difficult as the genetic engineering tools to isolate genes were developed for mammals in 1979 only. The model François Jacob proposed to account for development posits a sequence gene expression in stages, the unfolding of which depends on signals originating in the cell membranes. Several interesting proteins, including uvomorulin which has since become epithelial cadherin or E-cadherin, were thus discovered. On the other hand, some avenues explored, such as the mouse T complex, proved disappointing.

In 1984, the first genes regulating early embryonic development were discovered in the drosophila, the homeotic genes that determine the animal's body plan. François Jacob followed close behind these discoveries, and searched for the corresponding genes in mice. The laboratory he headed was a pioneer in gene inactivation in this animal. From the drosophila to the human being, including the mouse, it was discovered that homeotic genes have a collinear organization on the chromosomes, mapped onto that of the segments of the body whose development they control. One could not imagine a clearer demonstration of the conservation of regulatory genes throughout evolution. The fact that these genes had been discovered in the drosophila, which allowed for much

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faster experiments than in mammals, certainly did not detract from the visionary nature of the experimental approach implemented by François Jacob. In fact, since the eighties, the bulk of the international community's efforts to understand vertebrates' embryonic development have focused on the mouse. As for teratocarcinoma cells, they are similar to stem cells, the study of which has driven a profound revival of biology over the last fifteen years.

François Jacob enjoyed intimate discussions in groups of two or three. When the group was larger, he often remained silent. While he expected quality conversations, he was perhaps even more demanding when it came to the quality of people. He liked neither flatterers nor over-confident individuals, and could put them back in their place with just a word or gesture of impatience. Conversely, he welcomed some with visible pleasure. Conversations, irrespective of the topic, always started with a question regarding the progress of the other person's research. Eager for new results, he asked questions and suggested correlations with other processes. At any moment, he could exclaim "what you're doing is fantastic!", expressing generous enthusiasm. François Jacob liked to argue. "He looked for people who could put up a fair fight and genuinely needed it", in Michel Morange's words. The conversation then became like a game: he liked to be challenged and, even more so, to be surprised by an idea. The dialogue had a peculiar form. François Jacob would stare at the other person, then utter a few sentences, and suddenly a comment would come up which would shed light on the debate from an entirely different point of view, as if it had been obvious from the start. In no way did he seek to block the course of the discussion, but conversing with him required a rare presence of mind. He spoke completely freely, unconcerned about whether his words were well received or not, and did not burden himself with any consideration he did not deem useful... he seduced one.

François Jacob hated dogmatism. According to one of his colleagues, Nadine Peyriéras, "he never used arguments of authority with his scientific colleagues". Although they carried out their research freely, according to those who engaged in the study of embryonic development with him in the 1980s, he clearly expected results. Always ready to get excited about a new piece of data, he would rush to the laboratory to assess for himself what could be expected of it. He was meticulous in his scientific writing, and encouraged and accepted all suggestions. Whilst fully endorsing his responsibilities, he was fond neither of commissions nor of "redundant committees", and had a real aversion to anything pertaining to administration.

François Jacob rarely spoke about himself, never discussing the pain he still experienced following his war injuries. One day, however, in the atmosphere of freedom of speech that reigned in the 1970s, someone publicly reproached scientific personalities for taking up the front row of the lecture theatre during seminars, to which he bluntly replied: "I need to stretch my leg".

François Jacob's scientific research went hand in hand with epistemological reflection, which he presented in three books: *La Logique du vivant: une histoire de l'hérédité* (1970), *Le Jeu des possibles: essai sur la diversité du vivant* (1981) [*The Possible and the Actual*, 1982], and *La Souris, la mouche et l'homme* (1997) [*Of Flies, Mice and Men*, 1998].<sup>15</sup> A few elements of this reflection can also be found in his magnificent autobiography: *La Statue intérieure* (1987) [*The Statue Within: An Autobiography*, 1988]. From *La Logique du vivant* to *Le Jeu des possibles*, François Jacob evolved towards a vision of science that challenged the idea that it could provide comprehensive knowledge of reality. On the other hand, this vision stressed the fact that, just like myth, science fulfils human beings' irrepressible "need for unity and coherence".<sup>16</sup> We can see here the influence of Claude Lévi-Strauss, whom he held in high regard. François Jacob described science as a construct, like a creation of reality, not its revelation. He applied to it the conclusions of his reflection on evolution. Like evolution, the scientific approach is subject to the range of possibilities, but also to contingency, which, for science, corresponds to its actors' ways of thinking that are linked to their era. He developed the idea that the unity and diversity of life forms go hand in hand, for, in his own mechanistic metaphorical terms, "evolution proceeds like a bricoleur who, over millions and millions of years, slowly alters his work, constantly making adjustments, cutting this bit off, lengthening that one, finding every opportunity to adjust, transform, and create".<sup>17</sup> In fact, François Jacob saw scientific research itself as bricolage by scientist-bricoleurs. Is this conception a relativist one or, on the contrary, does it tell of an intellectual requirement to identify the limits of knowledge so as to overcome them?

With short and polished sentences and the right words colliding, François Jacob's writing was at once precise, full of imagery, alert and powerful. It is hard to believe that, in his own words, he struggled to write. To conclude, we would like to convey the expression of his convictions in a short excerpt from his book *La Statue intérieure*:

*Man exudes projects. Oozes plans. Reeks of intention. Does not tolerate contingency. Accepts neither that the evolution of species is random, nor that the history of human beings*



François Jacob in 2012

*obeys any secret law. Some claim this history is directed by awareness of a goal. Others by blind fatality. But whether humans believe they are aware of a goal or not, whether they consider themselves active or forced to fulfil tasks of which they do not understand the ultimate reason, all want to see history flowing inexorably in a single direction. What humans seek to the point of anguish in their gods, their art, their science, is meaning. They cannot stand emptiness. They pour meaning onto events like salt onto food. They refuse that life takes off again randomly, over the course of events, with noise and fury. They forever want it to be directed, reaching towards a goal, like an arrow.<sup>18</sup>*

As though in echo of that work, he concluded *Le Jeu des possibles* with these words: "It is hope that gives meaning to life... hope one day to be able to change the present world into a possible world, which seems better".<sup>19</sup> François Jacob was a "Companion of the Liberation", the highest distinction of the Second World War, a laureate of the Nobel Prize in Physiology or Medicine, and a member of the Académie française. He made history, that of Free France and that of molecular biology. He filled his life with meaning and enlightened what is perhaps our humanity. He was a tremendous scientist, and a humanist.<sup>20</sup> ■

**Profs Christine PETIT and Philippe SANSONETTI**

*Source: La lettre, no. 38, June 2014*

- (1) F. Jacob, *La Statue intérieure*, (1970) Gallimard, 1990, p. 78.
- (2) *Ibid.*, p. 35. (3) *Ibid.*, p. 56. (4) *Ibid.*, p. 82-83. (5) *Ibid.*, p. 118. (6) *Ibid.*, p. 138. (7) *Ibid.*, p. 175. (8) *Ibid.*, p. 236. (9) *Ibid.*, p. 269. (10) *Ibid.*, p. 280-281. (11) F. Jacob, *Les Bactéries lysogènes et la notion de provirus*, Masson, 1954; preface by André Lwoff, p. V. (12) F. Jacob, *Travaux scientifiques de François Jacob*, Nadine Peyrières and Michel Morange (eds), Odile Jacob, 2002, p. 22. (13) *La Statue intérieure*, *ibid.*, p. 398. (14) *Ibid.*, p. 397. (15) F. Jacob, *La Logique du vivant: une histoire de l'hérédité*, Gallimard, 1970; *Le Jeu des possibles: essai sur la diversité du vivant*, Fayard, 1981; *La Souris, la mouche et l'homme*, Odile Jacob, 1997. (16) *Le Jeu des possibles*, *ibid.*, p. 48. (17) *Ibid.*, p. 72. (18) *La Statue intérieure*, *ibid.*, p. 256-257. (19) *Le Jeu des possibles*, *ibid.*, p. 131.

This text draws on Georges Cohen, François Gros, Michel Morange, Nadine Peyrières and Agnès Ullmann's accounts, collected with the help of Michèle Roa, to whom the authors are very grateful.

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## GILLES VEINSTEIN

# A Day of Tribute to Gilles Veinstein

**At the initiative of the Collège de France and the Centre d'études turques, ottomanes, balkaniques et centre-asiatiques (CNRS/EHESS – Collège de France), and thanks to the generosity of the Fondation Hugot, a day was dedicated to Gilles Veinstein (1945-2013) on Friday 7 February 2014, almost exactly one year after his untimely death.**

After Prof. Henry Laurens had presented the biography and career of Gilles Veinstein (Turkish and Ottoman History, 1999 to 2012), eight colleagues and friends from France as well as from Austria, Greece, the United Kingdom and Turkey discussed his contribution to Ottoman studies and to historical studies as a whole. They looked back at his teaching at the École des Hautes Études en Sciences Sociales (EHESS) and at the Collège de France, and then at his research and publications according to the major areas he covered and the themes he addressed.

While discussing the teacher and the researcher from different angles, the speakers highlighted a number of common threads both in the evolution of Gilles Veinstein's interests and in his practice as a historian. Early economic, commercial and social history work on the Ottomans' relations with the Black Sea and the Pontic Steppes gradually led him to broaden his geographical area of interest to the Greek and insular territories. He focused in particular on land issues and the ways in which the Ottomans' settled in conquered territories, as well as on the functioning of the State (particularly during wartime) and the judicial system, and on diplomacy.

He also studied religious questions, as a historian of the State and as a comparatist. In parallel, he grew increasingly interested in discourse analysis and self-representation, a concern that was inseparable from the extreme importance he gave to the diplomatic study of first-hand documents, his favourite source. He would go and find his documentation not only in the Turkish archive collections but also others across Europe. He was keenly aware of the weight of words, and his use of widely diverse types of documents enabled him to avoid the pitfall of mis- and over-interpretation.

Both in his books and his lectures at the Collège de France, Gilles Veinstein demonstrated his exceptional gift of synthesis and clarity. He was able to situate the subjects he discussed in relation to the main trends of historical reflection in general, and then to the state of Ottomanist research, before returning to them open-mindedly. He based his work on documentary



Gilles Veinstein during his Inaugural lecture in 1999 © Jean-Pierre Martin

facts, even if they contradicted an appealing theory that showed a desire to demonstrate rather than to know and understand. Several speakers recalled how Gilles Veinstein put an end to the debate on the Ottoman *ciftlik* by returning to the facts, which he analyzed with subtlety and meticulously.

Gilles Veinstein's many articles demonstrate the same qualities and methods, never asserted but systematically applied. Based on a tangible case, the historian's gaze explored much broader horizons, embedding the study of an institution or of an event in a context or an evolution. The conclusion then offered a fine and original analysis of the nature of the Ottoman State and society, through which the core subject of the article revealed phenomena and trends of prime importance.

As a result, Gilles Veinstein was renowned as a historian whose horizons exceeded the field of Ottoman studies – a field which he contributed significantly to opening up. ■

**Nicolas VATIN**

Source: *La lettre*, no. 39, March 2015

## Programme

### Introduction

Henry Laurens, *Collège de France* and Nathalie Clayer, *CÉTOBAC*

### Morning session chaired by François Hartog, EHESS

*Listening to the Sources. Gilles Veinstein's Teaching at the École des hautes études en sciences sociales*

Nicolas Vatin, *CÉTOBAC, EPHE*

*Gilles Veinstein's Lectures at the Collège de France*

Olivier Bouquet, *Université Paris VII*

*Gilles Veinstein's Work on South East Europe*

Oliver Schmitt, *University of Vienna*

*Gilles Veinstein in Greek and Insular territory*

Elizabeth Zachariadou, *Honorary member of the Institute of Mediterranean Studies, Rethymno*

### Afternoon session chaired by Alexandre Popovic, CÉTOBAC

*With an Attention to Detail: Gilles Veinstein's Contribution to the Study of the Ottoman State*

Colin Imber, *Emeritus Professor at the University of Manchester*

*Ottoman Society in Gilles Veinstein's Work*

Suraia Faroqhi, *Bilgi Üniversitesi, Istanbul*

*Gilles Veinstein's Contribution to the Study of the Ottoman Economy and Trade*

Edhem Eldem, *Bosphorus University, Istanbul*

*Within and Beyond Ottoman Studies: Religious Questions*

Nathalie Clayer, *CÉTOBAC-EHESS*



**Nicolas VATIN**

Director of the Institute of Arab,  
Turkish and Islamic Studies,  
Collège de France

# Tribute to Jean-Pierre de Morant (1933-2014)

Head of Cultural Affairs and External Relations  
of the Collège de France from 1972 to 1998

**When an institution or a society – or both in the case of the Collège de France – must say goodbye to one of its most loyal supporters, the words it chooses are fitting for the circumstances.**

Fitting? This holds true only if they indeed are so, but not if they are spoken with their full meaning. Commitment, dedication, wisdom, competence, availability, firmness and courtesy, authority and discretion are all words which suddenly recover their full impact when referring to Jean-Pierre de Morant. All these words, and many others, attest to the loyalty of our memory of him.

Ultimately, they can all be summed up by a single word: passion, the passion for the Collège de France. Jean-Pierre de Morant put remarkable philosophical and literary culture at its service, open to the world all the way to Asia. But that is not all. Destined for a career in one of the most prestigious State institutions, Jean-Pierre de Morant forewent it fully and definitively – I will use the term again – to put himself at the Collège de France's service. Countless times over the years, those involved in daily life at the Collège de France, or who came to discuss situations or project of interest for the Collège's external relations, witnessed this man's exceptional qualities. He was a perceptive leader, who was wholly inspired by a higher interest of which he made himself a spokesperson throughout his life, and as such was unanimously listened to and respected.

Jean-Pierre de Morant not only paid careful attention to what we call current affairs. He also played a decisive role in advising, supporting and informing the Collège de France when it had to find new resources for its internal functioning and its teaching and research activities. Be it the creation of the Governing Board (*Conseil d'Établissement*), the extensions of the rue d'Ulm or of the École Polytechnique [to create the Cardinal-Lemoine site], or the lectures given outside Paris, first in France and then in Europe and beyond, Jean-Pierre de Morant was present and active in discussing the proposals submitted to the Faculty.

Of the many initiatives owed to Jean-Pierre de Morant at the Collège de France, the programme to renovate, modernize and extend the premises of the Marcelin-Berthelot site remains engraved in the very walls of the institution. When the time came to name the new teaching rooms, the first one being the lecture theatre, it was decided that it would be

named after the sister, confidante and advisor of our founder, Marguerite de Navarre – a name suggested by none other than Jean-Pierre de Morant himself. ■

**Prof. André MIQUEL**

Source: *La lettre*, no. 39, March 2015



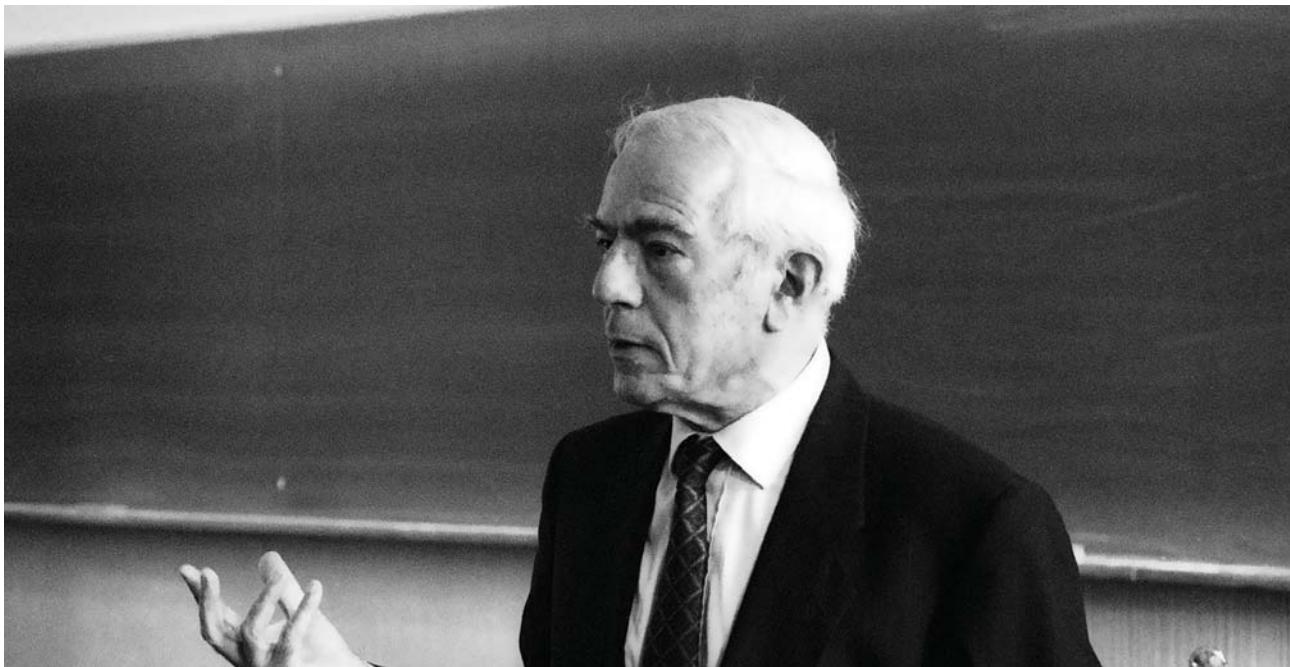
Jean-Pierre de Morant in 1998

**Prof. André MIQUEL**  
Emeritus Professor of  
Classical Arabic Language and  
Literature (1976-1997),  
Collège de France Administrator  
(1991-1997)



# Tribute to Maurice Agulhon (1926-2014)

Chair of Contemporary  
French History  
from 1986 to 1997



**The school teacher's son. This was how, in an autobiographical essay published in 1987, a year after his election at the Collège de France to the History of Contemporary France Chair, Maurice Agulhon summed up his childhood – a childhood which he had spent not so much in a village as in a school, that of Pujaut, in the Gard, where his parents were both teachers.**

Both were staunchly secular, left-wing and fervent pacifists. Both were protestant and had a private and strict faith. Their family ancestries however exemplified the dividing line of Christianity that had split the Provence region since the Protestant Reformation: the Huguenot Cévennes on his father's side, and the Catholic Midi on his mother's side, before she crossed the religious boundary.

"They did not like history, that I am sure of", wrote Maurice Agulhon, pointing out that for his pacifist parents, history was but a detestable tale of patriotic chauvinism, bloody wars and horrifying violence. And yet he chose history after completing his studies that led him from the Lycée Frédéric Mistral in Avignon, which he attended throughout his secondary education, to the *classes préparatoires* of the Lycée du Parc in Lyon which he entered in 1943.

He decided to be a historian when he was admitted to the École Normale Supérieure in 1946. This choice was sup-

ported by the teachings of Joseph Hours, the history professor of the *khâgne* preparatory course in Lyon. Hours was a Christian democrat resistant who introduced the new themes of the *Annales* in his lessons and made his students enjoy and respect politics, both inside and outside the classroom. Agulhon dedicated his most famous book, *Marianne au combat* [1979], to him. Of Hours he said, in 1987, "that he [was] the historian who had most profoundly influenced the history that he was then doing".

At the Rue d'Ulm, Maurice Agulhon joined the Communist Party and was an activist in the École Normale Supérieure and fifth arrondissement's cell. He remained a member of the Party until the late 1960s and has long reflected on the reasons for this disciplined and devoted commitment. There were the same reasons that many people his age, time, and background, shared, drawn as they were to a party that claimed to represent the Resistance movement, the nation and Republican democracy, and demanded rigorous moral

intransigence. Agulhon described the more secret reasons for his commitment as the search for a surrogate family, once removed – “freed” as he wrote – from the protective but constraining affection of his parents.

Choosing activism had its intellectual consequences, making him prefer contemporary history as his research field and Ernest Labrousse as his mentor, even though Labrousse was a member of the despised S.F.I.O. However, his history was economic and social, his references were Marxist and his historiographic horizons were very broad.

It was therefore with Labrousse that Agulhon submitted a thesis subject proposal on the Republican tradition in Provence, after passing his *agrégation* in 1950 and being appointed to the Lycée de Toulon and then the Lycée Thiers in Marseille as a *khâgne* professor. The fact that, at the time, many scholars were researching the history of the French *départements*, and that thesis subjects on the Bouches-du-Rhône and the Var after 1851 had already been submitted, forced him to amend the subject of his thesis, which he defended at the Sorbonne in 1969 as “A Popular Movement in the Days of 1848: history of the Var populations in the first half of the nineteenth century”. The rapporteur was Pierre Vilar, who had succeeded Ernest Labrousse, also a member of the thesis jury.

By 1969 Maurice Agulhon had already authored another thesis and had introduced into historians’ vocabulary the notion of sociability, which remains associated with his work. In 1957, after a three-year secondment at the CNRS, he became Pierre Guiral’s assistant at the Aix-en-Provence Faculty of Letters. He was exploring the reasons for which traditional Provence, both urban and rural, had readily embraced republican democracy, and posited that the lively civil society life in Provence was the crucible of the republican political preference. The nineteenth-century local associations, societies, circles and barrack-rooms undoubtedly had deep roots that Maurice Agulhon found in the penitent brotherhoods of the Old Regime. Through a subtle prosopographical analysis, he showed that during the eighteenth century, the same men had gone from religious brotherhoods to Masonic Lodges, which was a new way of conceptualizing the secularization processes and transfers of sacredness that marked the Enlightenment era. The study was defended as a PhD thesis in Aix-en-Provence in 1966 and was published by a small local publisher under the title of *La Sociabilité méridionale*. It drew the attention of André Latreille, a columnist in *Le Monde* at the time, and was republished more widely two years later as *Pénitents et franc-maçons de l’ancienne Provence. Essai sur la sociabilité méridionale*, in an Éditions Fayard series edited by François Furet and Denis Richet. Daniel Roche, with whom I have written this tribute, dedicated a warm review to it in the *Revue historique*.

Having become an assistant lecturer, then a lecturer, and after defending his PhD thesis, a professor, it was at the University of Aix-en-Provence that Maurice Agulhon took part in the May '68 events. As head of the SNESup branch, he fought for a democratic university reform and, he added,

for “the fall of the Gaullist government”. This activism did not go so far as to shake his *habitus* since, as he confessed, “during those days, despite the heat, I always came to the faculty wearing a jacket and tie”. The government did not fall, but the Faure Act democratized universities and, from then on, Maurice Agulhon was an advocate of the new academic procedures.

This first period of his life ended with the fragmented publication of his great work in three books published in 1970 and 1971: *Une ville ouvrière au temps du socialisme utopique. Toulon de 1815 à 1851; La Vie sociale en Provence intérieure au lendemain de la Révolution*; and, the most famous of the three, *La République au village*. This work marked what Maurice Agulhon called his “historiographical move”, taking him from Labroussian history, that of the prices of structures and of conjunctures, to the exploration of the collective mind. It is no coincidence that the conclusions of *La République au village* ended with a citation by Michelet and an explicit reference to “cultural history”. In 1972, Maurice Agulhon was elected professor at the University of Paris I. As a Parisian, he henceforth became Marianne’s historian.

Maurice Agulhon’s arrival in Paris marked a change of direction in his work. Regarding the “scientific justification” of his application to the Sorbonne, some of his friends were surprised that one could leave Aix-en-Provence to go “bury themselves in Paris”. He thus noted: “through research more easily scaled up to national level, I wanted to come to test the systems I had constructed in a provincial microcosm that was perhaps a little too specific. In short, as professional sportsmen put it, I wanted to move up to the national league”.<sup>1</sup> He began this “translation from the particular to the general” by accepting two commissions from publishers. He first wrote a two-volume synthesis on twentieth-century France for Éditions Nathan. Then, more importantly, in 1973 he wrote *1848 ou l’apprentissage de la République (1848-1851)* for the “Nouvelle histoire de France”, a new series published by Éditions du Seuil. This book was to be his best-seller (nearly 100,000 copies sold). Answering Pierre Nora’s call, he also contributed *Les Quarantes-huitards* (1975) to the “Archives” series of the publishers Julliard and Gallimard.

Not long after 1968, Maurice Agulhon contributed to giving this “forgotten and depreciated revolution”, in his own words<sup>2</sup>, its place in French history, and revived the old “Society of History of the 1848 Revolution and of the Nineteenth-Century Revolutions”, which he presided in 1975 and 1981. It was a sign of the times that he then felt the need to justify at length his application of the term revolution to the February 1848 events, at a time when the star of 1917 still shone bright for many.

Those years of teaching at the Sorbonne also afforded him the opportunity to develop further his hypotheses on the speed of acculturation to democratic and republican ideas in the rural world, which he had presented in *La République du village*. He did so in the re-edition of the book, and in a significant contribution to *L’Histoire de la France rurale* edited by Georges Duby.<sup>3</sup> But most importantly he started to become

the historian of the republican idea through its symbols. In his thesis research, he had often noticed Republican statues erected on Provencal village squares, and had made it a habit to photograph and to index them. Gradually he had come to see them as “a national more than a regional subject”. The hobby thus became a historical problem, as he put it.<sup>4</sup> This is where his research on Marianne began, which he launched in 1979 by publishing *Marianne au combat. L'imagerie et la symbolique républicaines de 1789 à 1880*.

This work, of a pioneering nature as regards its method and its subjects, was to flourish fully after his election at the Collège de France – where he taught for eleven years, from 1986 – with the publication of another two volumes: *Marianne au pouvoir. L'imagerie et la symbolique républicaines de 1880 à 1914*, and then *Les Métamorphoses de Marianne. L'imagerie et la symbolique républicaines de 1914 à nos jours*.<sup>5</sup> With these books, Maurice Agulhon provided a perceptive explanation of the conflicts and convergences that gradually led the French to recognize themselves in the Republican idea, through a study of the variations of the Marianne busts which an 1884 law had made compulsory in every town hall.<sup>6</sup> This work led him to the figure of de Gaulle, who is central to the volume *La République* (1990) of the prestigious history of France published by Hachette, which he concluded, following Georges Duby's, Emmanuel Leroy-Ladurie's and François Furet's contributions. Whereas he initially saw the Croix de Lorraine as competing with Marianne and de Gaulle as a “Mariannophobe”, he ultimately painted a more nuanced picture of them. He was thus breaking with all the caricatures, which were still prevalent at the time<sup>7</sup>, of de Gaulle as the one who had definitively brought the right into the Republic. He also incorporated into this Republic the values of the State and the nation, which had previously been largely excluded from it. He was thus one of the first, in turn, to perceive the meaning of the consensus that was starting to form among the French around the figure of the General.

Through the subjects that he studied, Maurice Agulhon was always interested in the politics of his time. But he did so in his scholarly and objective way, with equanimity, never again joining a political party after saying his farewells to communism. He simply called himself a “socialist of the most moderate wing”<sup>8</sup>, still however joining forces with the left wing historians which, at the time of the 1789 bicentenary, crossed swords with interpretations of the events inspired by François Furet. Ultimately, he was more of a free spirit. It is therefore not surprising that in 2005 he signed the famous appeal, “Freedom for History”, launched by those (including his colleagues Jean Leclant, Jean-Pierre Vernant and Paul Veyne) concerned about the excesses of memorial laws, of which the so-called 1990 Gayssot Act constituted the first part.

► Extract from Fang Guancheng's book *Yuti Mianhua tu* (Illustrations of Cotton Production), 1767, Institute of Advanced Chinese Studies, Collège de France.

I will cite the terms that he endorsed:

*History is not a religion. The historian accepts no dogma, respects no interdict; knows no taboos. He can disturb.*

*History is not moral. The historian's role is not to praise or condemn, but to explain.*

*History is not a slave to current affairs. The historian does not map contemporary ideological systems onto the past and does not introduce today's sensitivity into the events of the past.*

*History is not memory. The historian, following a scientific approach, collects the memories of people, compares them with one another and with documents, objects, traces and established facts. History takes memory into account; it does not amount to it.*

*History is not a legal fact. In a free state, it is neither for parliament nor for the judiciary to define historical truth.* ■

**Prof. Roger CHARTIER (first part)  
and Prof. Pierre ROSANVALLON (second part)**

Source: *La lettre*, no. 39, March 2015

(1) « Vu des coulisses », in Pierre Nora (ed), *Essais d'égo-histoire*, Gallimard, 1987, p. 47.

(2) *Les Quarantes-huitards*, Gallimard, 1976, p.10.

(3) *L'Histoire de la France rurale*, Vol. III: De 1789 à 1914, Georges Duby and Armand Wallon (eds), Éditions du Seuil, 1976.

(4) « Vu des coulisses », *op. cit.*, p. 41.

(5) Respectively in 1989 and 2001.

(6) Which also led him to contribute to the first volume of *Lieux de mémoire*, edited by Pierre Nora, Gallimard, 1993, a beautiful contribution on “the town hall”.

(7) See his *Coup d'État et République* (Paris, Les Presses de Sciences Po, 1997), in which he presents a first report on his reflection on the Gaullist phenomenon.

(8) « Vu des coulisses », *op. cit.*, p. 57.

► The Collège de France's Administrator and Professors are sad to announce the death of three of their colleagues: **Edmond Malinvaud**, Chair of Economic Analysis (1987-1993), on 7 March 2015, **Georges Blin**, Modern French Literature (1965-1988) on 14 May 2015 and **George Le Rider**, Chair of Economic and Monetary History of the Hellenistic Orient (1993-1998), on 3 July 2014. We will pay tribute to them in forthcoming issues of *La lettre du Collège de France*.



**Prof. Roger CHARTIER**  
Writings and Cultures  
in Modern Europe  
**Prof. Pierre ROSANVALLON**  
Modern and Contemporary History  
of Politics



# FACULTY FACTS AND DATA

2013/2014

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**Vice-Administrator:** [John SCHEID](#),

Religion, Institutions and Society in Ancient Rome

**Secretary:** [Marc FONTECAVE](#),

Chemistry of Biological Processes

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- Yves BONNEFOY**, Comparative Studies of the Poetic Function (1981-1993)
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**Nicole LE DOUARIN**, Molecular and Cellular Embryology (1988-2000)

**Jean-Marie LEHN**, Chemistry of Molecular Interactions (1980-2010)

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**Georges LE RIDER**, † (3 July 2014)

Economic and Monetary History of the Hellenistic Orient (1993-1998)

**Emmanuel LE ROY LADURIE**, History of Modern Civilization (1973-1999)

**Jacques LIVAGE**, Chemistry of Condensed Matter (2001-2009)

**Edmond MALINVAUD**, † (7 March 2015)

Chair of Economic Analysis (1987-1993)

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# Renewal of the Fondation de l'Orangerie Sponsorship

**The Fondation de l'Orangerie for Individual Philanthropy is lending its support to two major Collège de France projects: Salamandre, a platform providing access to the institution's archives, and the research project on artificial synthesis in the field of renewable energy, led by Prof. Marc Fontecave, Chemistry of Biological processes, since 2008.**

Following the completion of the first phase of the development of the portal Salamandre, with over 35,000 documents that have been put online, the Fondation de l'Orangerie has renewed its support to the Collège de France to pursue digitization and to afford the general public the widest possible access to its heritage and scientific archives.

**Interview with Nathalie Sauvanet, Managing Director of the Fondation de l'Orangerie for Individual Philanthropy and responsible for the philanthropy offering of BNP Paribas Wealth Management.**

**Could you present the Fondation de l'Orangerie for Individual Philanthropy to us?**

**NATHALIE SAUVANET** The Fondation de l'Orangerie for Individual Philanthropy was created in 2008 at the initiative of François Debiesse, manager of BNP Paribas Wealth Management, the private banking branch of the BNP Paribas group that supports its clients in their asset management. Since 2008, it has also been advising them when they wish to support a philanthropic cause financially. The Fondation de l'Orangerie, created for this purpose, federates the energy of our respective clients who do not necessarily have the desire, the means or even the time to initiate their own action or foundation.

By creating the foundation, we sought to provide our clients with additional support in a process involving far more than management expertise. In particular, we wanted our action to complement and not to compete with that of existing NGOs and other funding organizations. The Fondation de l'Orangerie has encouraged new donors to come forward. ▶



**François Debiesse,  
President of the Fondation  
de l'Orangerie for  
Individual Philanthropy:**

"When I decided to create a department of philanthropic expertise within a private bank, my aim was threefold:  
- to advise and support our clients in their philanthropic intentions, as I had sensed both their demand and their needs in this respect;  
- to help our clients to serve the general interest through these actions;  
- and thereby to add a new dimension of responsibility to our practise of private banking.

I am proud of this partnership and glad that it functions so well. The Collège de France's projects fully match the purpose of the Fondation de l'Orangerie to "help preserve and transmit knowledge and heritage".

What other place in France represents such intellectual heritage and embodies such a degree of excellence in both research and the transmission of knowledge? This institution is to my mind unique, as it is both a formidable place of memory of multiple forms of knowledge, and an exceptional laboratory where tomorrow's France, society, world and people are being prepared."



**Nathalie SAUVANET**  
Managing Director  
of the Fondation de l'Orangerie  
for Individual Philanthropy

# INRIA and the Collège de France are renewing their partnership

**In November 2009, the Collège de France in partnership with INRIA created the Chair of “Informatics and Digital Sciences”, for a period of five years.**

This creation, a strong symbol of recognition of informatics, is owed to the support of Pierre Corvol, the Collège's Administrator at the time, and that of the professors, particularly Pierre-Louis Lions (Partial Differential Equations and their Application, 1992). Great scientists working in France or the United States have successively held this Chair, and thus enabled us to discover some of the facets of informatics and its applications.

Gérard Berry, the first Chairholder, started off in 2010 by considering ways of “Conceiving of, Modelling and Mastering Computing”. This was a great inauguration for a Chair whose successive incumbents have successfully articulated societal issues to the state of the art in digital sciences. Gérard Berry defined the question in very broad yet precise terms, investigating the notions of computability, parallelism and modelling. As an experienced teacher, he then took this inaugural lecture to various audiences in different countries and in different languages.

In 2011, informatics security specialist Martin Abadi temporarily left Silicon Valley for the Collège de France. Core to his teaching were computer security issues, in the era of the Web and of the generalization of open systems. Questions of identity, anonymity and private data protection were discussed, and the general models of security, protection techniques and mechanisms, along with their claims, limits and flaws, were demonstrated.

In 2012 Serge Abiteboul presented another facet of digital science research: data science, a crucial subject in view of the growth and “massification” of data. In 2013, Bernard Chazelle came from Princeton to highlight algorithms' potential in the development of other sciences (physics, biology, etc.). Finally, on 10 April 2014, Nicholas Ayache completed the five-year cycle by describing the “virtual patient” and the challenges of so-called digital medicine, a sub-branch of informatics research that combines high-level medical research with imaging, modelling and simulation.

► When it came to defining the foundation's purpose, our idea was to draw inspiration from the primary purpose of a private bank, that is, preserving and transmitting heritage, and to make that the basis for the Foundation de l'Orangerie's mission: the preservation and transmission of heritage and knowledge.

## How do you choose which projects to support?

**N. S.** The deliberately very broad definition of our foundation's objective allows us to support initiatives in all domains – health, culture, and education –, with a specific approach: the preservation and transmission of knowledge and heritage. Thus, for instance in the field of health, we do not finance the construction of a building but we will support a nurses' training programme.

We then have a strict selection procedure and criteria. Our primary criteria of course relate to the nature of the project, its audience and its impact. But we are also attentive to the sound governance of the organization carrying out the project and to its professionalism, which are crucial to the project's success and to the follow-up we carry out on behalf of our donors.

Once a programme has been identified, it must be presented and validated by the three colleges that make up the Fondation de l'Orangerie: the college of founders, that of independent experts and the college of donors.

## How do the Collège de France projects you have chosen to support meet your donors' expectations?

**N. S.** There is real history between the Fondation de l'Orangerie and the Collège de France. One of the very first projects supported by the Fondation was the digitization of the Claude Lévi-Strauss Archives. On that occasion, we sensed the donors' involvement. It was in particular one of the donors' commitment that encouraged us to select this project, which also perfectly matched the objectives we had set ourselves to preserve and to transmit knowledge. Once again, our donors' conviction and involvement allowed us to support the Collège de France in this vast and ambitious enterprise of digitizing and disseminating its archives through the dedicated platform, Salamandre. ■

**Interview by Julie BÉRET, Cultural Affairs and External Relations Division**

Source: *La lettre*, no. 38, June 2014



Gérard Berry, Designing, modelling and mastering computation in informatics (2009/2010)

In view of the quality of the Chairs and the success of their lecture series, the Collège de France and INRIA have decided to renew their partnership for a three-year period, thanks to the strong support of Serge Haroche, the current Collège's Administrator, Pierre Corvol, now president of the Fondation du Collège de France, and several professors. We hope that these three years will see one of the great female scientists of our fields have the honour of delivering an inaugural lecture [The Chair is currently being held in 2014/2015 by Marie-Paule Cani, who specializes in 3D Digital Design and was the first woman appointed to that annual post].

And the next generation is taking over: in 2011 Sylvain Arlot, a junior researcher of the Willow Project team, delivered one of the two Peccot courses, awarded to mathematicians under the age of 30. Jonathan Touboul, of the Mycenae project team, is pursuing his work with the Centre for Interdisciplinary Research in Biology (CIRB). With a transdisciplinary approach, he is contributing to shedding light on the functioning of cortical areas of the brain, thereby furthering our understanding of its normal and pathological behaviours.

Gérard Berry has now been elected to hold one of the Collège de France's permanent Chairs. In 2012, the Collège de France decided to create a new Chair of "Algorithms, Machines and Languages", and its incumbent is none other than the first annual Chair of "Informatics and Digital Sciences". INRIA is delighted with this initiative and would like to thank the Collège de France warmly.

We hope that the existence of these Chairs linked to informatics and digital sciences, in the prestigious institution that is the Collège de France, will help to introduce them into the syllabi of the French education system. While we are proud that an "Informatics and Digital Sciences" area of specialization exists in some scientific high-school senior year courses, we should strive to have such teaching offered everywhere and to everyone. The world is becoming digital, said Gérard Berry; it is therefore crucial for our country to provide everyone with the main keys to this new world. The same goes for France's place in the digital world, be it from a societal, scientific or economic point of view. ■

#### **Michel COSNARD**

*Source: La lettre, no. 38, June 2014*



Martin Abadi, Computer Security (2010/2011)



Serge Abiteboul, Data Sciences: From first-order logic to the Web (2011/2012)



Bernard Chazelle, Algorithms and Science (2012/2013)



Nicholas Ayache, From Medical Imaging to the Digital Patient (2013/2014)



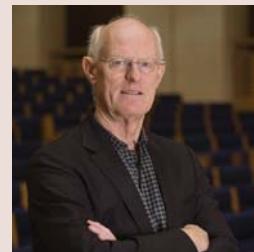
**Michel COSNARD**  
CEO of INRIA (Institut National  
de Recherche en Informatique et  
en Automatique)

# Tony Cragg

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## AT THE COLLÈGE DE FRANCE

### *Twelve Works to Discover*



*Tony Cragg, invited to the Collège de France's Chair of Artistic Creation in 2013/2014, gave a lecture series on the theme "Sculpture and Language", which is now available at [www.college-de-france.fr](http://www.college-de-france.fr), on the Tony Cragg's page.*

*In addition to his lecture series, the artist lent twelve of his works to the Collège de France. They were exhibited in its main courtyard and lobby during the year, until June 2015.*

## INTERNATIONAL VISITING PROFESSORS 2013 / 2014

### VISITING PROFESSORS

#### BELGIUM

**Prof. Dominique LAMBERT**, University of Namur (Thomas Römer), February/March 2014: 1. Entre «création» et «commencement»: Georges Lemaître et des débats philosophico-théologiques autour du big bang; 2. Le catholicisme face au darwinisme: une approche historique et critique.

**Prof. Emmanuelle DANBLON**, Université Libre de Bruxelles (Carlo Ossola and Alain Berthoz), March 2014: L'Homme rhétorique pour une conception humaniste de la raison pratique.

#### CANADA

**Prof. Susanna BRAUND**, University of British Columbia (John Scheid), June 2014: 1. Le cas étrange du livret latin de l'*OEdipe Roi* de Stravinsky; 2. La signification du choix de la forme métrique dans les traductions; 3. Le phénomène des traductions partielles: le cas de l'Énéide et des bucoliques de Virgile; Tableau et spectacles: l'appréciation de Sénèque par les dramaturges européens des XVI<sup>e</sup> et XVII<sup>e</sup> siècles, surtout Garnier, Dryden et Lee.

**Prof. Frédéric LAUGRAND**, Université Laval, Québec City, Canada (Philippe Descola), April/May 2014: 1. Des prédateurs et des proies ou comment les Inuits et leurs animaux défient nos approches ontologiques; 2. La revitalisation de la chasse à la baleine et la crainte des petites bêtes dans l'Arctique central canadien.

#### GEORGIA

**Prof. Zurab MAKHARADZE**, Otar Lordkipanidze Archaeological Research Center, Georgia National Museum (Frantz Grenet), February 2014: Les tumuli riches de l'âge du Bronze ancien en Géorgie.

#### GERMANY

**Prof. Helmut MÜLLER**, German Archaeological Institute, Munich (Denis Knoepfler), October 2014: Pergame hellénistique et romaine: cinq siècles d'histoire éclairés par l'étude des inscriptions. 1. Les débuts d'une cité grecque de l'Asie Mineure occidentale; 2. Pergame capitale des rois Attalides; 3. Pergame sous la domination de la République romaine; 4. Pergame à l'apogée de l'Empire romain.

#### GREAT BRITAIN

**Prof. Eugene ROGAN**, Saint Anthony's College, Oxford (Henry Laurens), June 2014: The Young Turks and the Destruction of the Armenian Community in the First War.

#### GREECE

**Prof. Nicolas ROUGERIE**, Researcher, LPMMC, CNRS, and Grenoble University, Claude-Antoine Peccot Foundation Lecture Series, February/March 2014: Théorème de Finetti et Limites de Champ Moyen.

**Prof. Emanuele GRECO**, Italian School of Archaeology at Athens (John Scheid), February/March 2014: 1. Athènes: histoire archéologique des espaces publics à la chute des tyrans; 2. À la recherche de l'agora de Sparte; 3. Le débat en cours sur la «colonisation» grecque en Occident; 4. De Sybaris à Thrioi.

#### ISRAEL

**Prof. Shaul SHAKED**, Hebrew University of Jerusalem (Frantz Grenet), April 2014: Une communauté juive Khorasan avant la période mongole d'Après une nouvelle trouvaille de manuscrits.

**Prof. Oded LIPSCHITS**, Tel Aviv University (Thomas Römer), October 2013: The Royal Garden of the Answer to the "Riddle of Ramat Rahel".

#### JAPAN

**Prof. Yoichi HIGUCHI**, Member of The Japan Academy (Anne Cheng), June 2014: Parcours de la notion d'«individu au Japon»: observations par un juscomparatiste sur ce mot-clé pour comprendre l'histoire intellectuelle dans un univers extra-occidental.

#### NETHERLANDS

**Prof. Bob BECKING**, Utrecht University (Thomas Römer), December 2013: Paleoclimatology and Ancient Israel, Two Examples: David and the Exile.

## VISITING PROFESSORS

### SWEDEN

**Prof. Ingela NILSSON**, Uppsala University (John Scheid), November 2013: 1. Les amours d'Ismène et d'Isménias - «roman très connu». A Byzantine Novel in 18th Century Paris; Talking with Dead Authors: from Lucian to Boileau via Byzantium.

### TURKEY

**Prof. Edhem ELDEM**, University of Bogaziçi (Henry Laurens), February 2014: L'Empire ottoman, la Turquie et la question des modernités.

### UNITED STATES

**Prof. James HUDSPETH**, Rockefeller University (Christine Petit), October 2013: 1. Senses and Sensitivity: An Introduction to the Neuroscience of Perception; 2. How the Ear's Works Work: The Operation of the Inner Ear; 3. Making an Effort to Listen: The Active Process of the Cochlea; 4. Getting in Tune: Frequency Selectivity and Synaptic Transmission in the Ear.

**Prof. Sriram SHAstry**, University of California, Santa Cruz (Antoine Georges), March/April 2014: Theory of Extremely Correlated Fermions, 1. General Theory; Large Dimensions; 3. ARPES in Correlated Matter, the Significance of Kinks and Asymmetric Line Shapes.

**Prof. Emiko OHNUKI-TIERNEY**, University of Wisconsin (Philippe Descola), January 2014: 1. How Do Flowers Kill?: Communicative Opacity in Political Spaces; 2. Symbolism and Political Economy: "Rice as Self" in Japanese Culture and Society.

**Prof. Glen W. BOWERSOCK**, Institute for Advanced Study, Foundation Michonis, September 2013: Les anges paëns de l'antiquité tardive.

**Prof. Edward A. LEE**, Berkeley University, California (Gérard Berry), December 2013: Cyber-Physical Systems: A Fundamental Intellectual Challenge.



## NEW LECTURE SERIES PLURI-ANNUAL LECTURE SERIES

# 2013-2016 Lecture Series Jean-Louis Cohen (New York University)

**The launch in May 2014 of the lecture series delivered by Visiting Professor Jean-Louis Cohen from New York University, opened a new chapter in the history of teaching at the Collège de France, namely that of the Pluri-Annual Visiting Professorships.**

The new system increases the Collège de France's freedom of action: it can now invite professors and ask them to teach for relatively long periods of time, even if they choose not to give up the permanent position they hold in another institution, which would prevent them from occupying a permanent Chair. These professors can now sometimes teach at the Collège de France for several years.

A professor's teaching can indeed be developed over two or three years. The Collège de France's existing Annual Chairs do not always allow for this, since, like permanent Chairs, they are governed by civil service rules, which, for example, set an age limit on professors' right to teach. Visiting professors are not subject to these rules that forbid us, for example, from inviting distinguished personalities over the age limit to provide continuous teaching at the Collège de France. Moreover, the teaching delivered by Annual Chairs may not exceed one year, which may be too short for developing a broader teaching project. Annual Chairs are tailored to focusing on a specific problem or a current research trend, not to elaborating a broader research theme. Hence, Pluri-Annual Visiting Professorship positions potentially offer French or foreign colleagues the opportunity to devote themselves to a detailed study of one aspect of their research, which their permanent activities would not allow them to do to the same extent. ■

**Prof. John SCHEID**

*Source: La lettre, no. 38, June 2014*



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**Jean-Louis Cohen is an architect, a historian, and the author of many studies on architecture and cities from the nineteenth century to the present.**

After obtaining a PhD in the History of Art, and accreditation to supervise research, from the EHESS, he headed the architectural research programme of the Ministère de l'Équipement (1979-1983) before holding a research Chair at the École d'Architecture Paris-Villemin (1983-1996). He was then Chair of History of Cities at the Institut français d'Urbanisme, Université Paris 8 (1996-2005), and in 1994 was appointed Sheldon H. Solow Professor in the History of Architecture at New York University's Institute of Fine Arts. In 1997 the Ministry of Culture entrusted him with the creation of the Cité de l'Architecture et du Patrimoine, where he headed the Institut Français d'Architecture and the Musée des Monuments Français until 2003. Jean-Louis Cohen has designed and curated many exhibitions, including *The Lost Vanguard*, at the New York Museum of Modern Art (2007), and *Scènes de la vie future* and *Architecture en uniforme*, at the Canadian Centre for Architecture in Montreal (1995 and 2011). At the Georges Pompidou Centre, he was in charge of architecture for *Paris-Moscou* (1979) and scientific adviser for *L'aventure Le Corbusier* (1987). His exhibition *Le Corbusier, an Atlas of Modern Landscapes* was presented in Barcelona and Madrid in 2014, and he curated the French Pavilion at the Venice Architecture Biennale.

Jean-Louis Cohen's lecture series in 2014 considered the configurations of architecture in France from the early twentieth century, in the European context, and in relation to colonial policies. Central to the reflection were the tensions between institutions and professions, and between aesthetics and uses. The hypothesis proposed was that the structures constituting modernity in the French context, including in the colonies as laboratories, were all marked by the recurrent convergence of extremely powerful public policies, and by France's "constructive disposition", which Sigfried Giedion identified in 1928. Many episodes were marked by it, including for instance the programmes of the Loucheur law, those of the three reconstructions (1918, 1940 and 1945), and those of the high-density housing policy. The two wars were far from being periods of stasis, and the borders were porous: while models, forms and techniques from England, Germany and the United States were continuously received, France also exported its experiments way beyond its metropolitan territory. ■

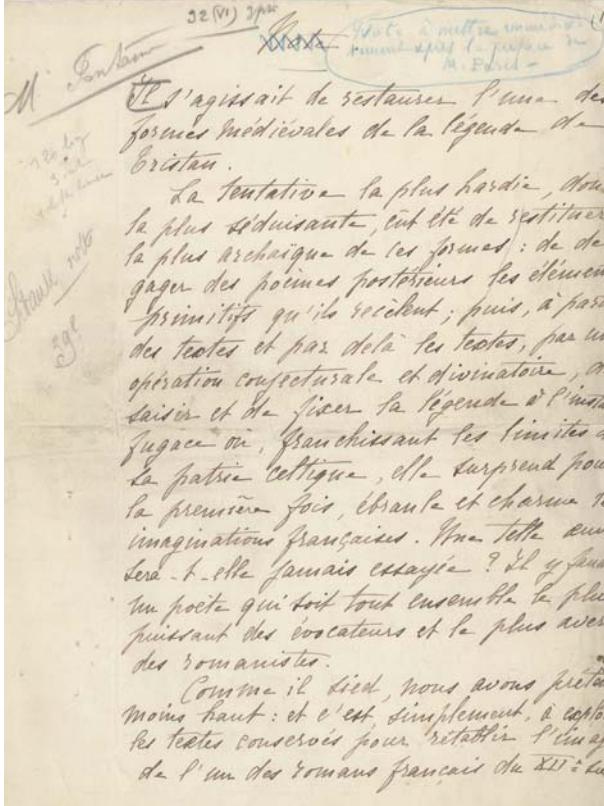
### Jean-Louis Cohen's lecture programme, 2014

- 21 May: Architecture, Modernity, and Modernization
- 27 May: Social Reform and Modernity
- 04 June: War and Reconstruction
- 11 June: High-Growth Languages and Techniques
- 18 June: The Modernization Programmes
- 25 June: Catharsis and Renewal

### Symposium, Monday 23 June 2014 Modern Architecture, Promise or a Menace?

**Prof. John SCHEID**  
Religion, Institutions and Society  
Ancien Rome  
Collège de France  
Vice-Administrator





Manuscript of additional notes for *Tristan et Iseut*, n.d.,  
Collège de France Archives

### The archive collection of Joseph Bédier (1864-1938) recently returned to the Collège de France Archives.

Joseph Bédier, who was elected Chair of Medieval French Language and Literature in 1903, left a considerable body of documents to the Collège de France, of which he was the Administrator from 1929 to 1936. The public already knew Joseph Bédier when he presented his candidacy for the Chair left vacant by his master Gaston Paris (1872-1903). His edition of *Tristan et Iseut* three years earlier had earned him a fine reputation, and his theses (particularly *Les fabliaux*, 1893, reed. 1895) did not go unnoticed in the world of philological research. The Bédier archive collection, which the Collège de France owns, represents about five linear meters.

The successive inventories reveal hundreds of letters and thousands of draft ages, in which lectures and book manuscripts are hardly distinguishable from one another. The reader witnesses the genesis of complex and singular work. Added to this are Bédier's lectures, particularly those he delivered abroad as a lecturer at the University of Freiburg or as a speaker in numerous American universities, where he was a genuine "travelling spokesman of French literature", as his biographer Alain Corbellari called him (*Joseph Bédier, écrivain et philologue*, Geneva, Droz, 1997).

His archives allow for the comprehensive study of the philologist, through his multiple responsibilities, from his Freiburg lectures to his work as the Collège de France's Administrator. They offer as much insight on the man as on his work. We get a sense in them of the strength of his commitment, particularly during the Great War. The fact that the author readily headed to the trenches to gather first-hand accounts attests to his perfectionism and to his unrelentless search for truth, both in this context and in medieval texts. He also displayed these qualities beyond his field of study, be it for the publica-

# The Bédier Archives: at the sources of philology

tion of *Histoire de la littérature française illustrée* (in collaboration with Paul Hazard) or in his studies on Chateaubriand, Pascal, Boileau or Racine.

Bédier was at ease debating and readily demonstrated his singularity, though with a certain humility. *Les Fabliaux* already contradicted most philologists' arguments. We can follow him preparing the ground, answering his opponents without swaying, whilst continuously correcting himself: in fact, the ratio is three drafts to a manuscript. His style, which is sometimes polemical, is deliberately jousting. The one whom, among the candidates to the Collège de France, Michel Bréal [Comparative Grammar, 1866-1905] considered as possessing "a high degree of literary sentiment" (Faculty Meeting of 15 August 1903), built a rigorous method, which some thought that he had lacked in his younger years. He opposed earlier theories (that of Karl Lachmann) and unpacked the most innovative ones, following Dom Henri Quentin's method of critical editing of ancient texts. More controversial were his heated conversations with Pio Rajna in 1910, though they also attested to a chivalrous sense of honour (the feature on the "Réponse à Pio Rajna" ("Reply to Pir Rajna") published in *La Revue du Midi* is evocatively titled "Defence against an uncalled for reproach").

The archives reveal the patient construction of a methodical work. Like an ultimate tribute to his master, Bédier broke away from the teaching of Gaston Paris [Medieval French Language and Literature, 1872-1903], who nevertheless carried on supporting him, to open a new path in the philological study of medieval texts. Hundreds of very well preserved letters constitute another major element of the collection and map out Bédier's relations with the cultural world of the day. He was at the heart of the intellectual circles of the first half of the twentieth century, a position that was consecrated by his election to the Académie française in 1920, where he succeeded Edmond Rostand. Bédier's considerable legacy is now accessible for research purposes in a single place. His archives (the inventory of which is available online at: <https://salamandre.college-de-france.fr>), his work and works devoted to him can all be found in the Bibliothèque générale, which is part of the Documentary Networks and Partnerships Division. ■

**Christophe LABAUNE**

Source: *La lettre*, no. 38, June 2014



A symposium dedicated to Joseph Bédier was held at the Fondation Singer-Polignac, on 22 and 23 May 2014.

**Christophe LABAUNE**  
Archivist, Documentaries Networks  
and Partnerships Division



# Small Tales about a Chinese Catalogue

**Since the time of Enlightenment philosophers and missionaries, Chinese studies and books produced in China have been well received in Europe, including at the Collège de France, where Jean-Pierre Abel-Rémusat held the Chair of Chinese and Tartar-Manchu Language and Literature from 1814 until 1832.**

Interest in Chinese writings and documents at the Collège de France did not wane. In 1970, the Institute of Advanced Chinese Studies (IHEC), officially founded in 1920 and completed in 1927 by Paul Pelliot (another Collège de France sinologist who held the Chair of Language and History of Central Asia, between 1911 and 1945, and the sinologist Marcel Granet, naturally found its place alongside the four other institutes (Japan, Korea, India, Tibet) that make up the Far East Institutes (Instituts d'Études Orientales [IEO]). Throughout this glorious history many books and a few treasures were accumulated and recorded over the years in a bilingual catalogue on index cards. Some are adorned with beautiful writings; others, less so, probably the work of Westerners. These were often students, who transliterated the Chinese into Latin characters according to the rules of the École Française d'Extrême-Orient. This "narrative from the inside" (内傳, *neizhuan*) of a catalogue packed with adventures could be prolonged, but these few lines are only intended to present its penultimate developments.

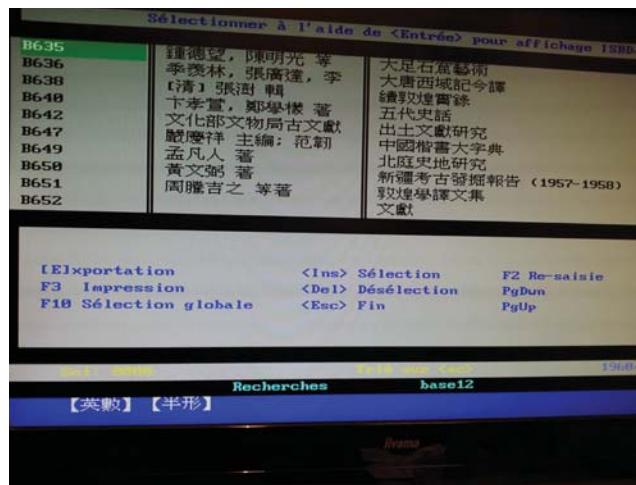
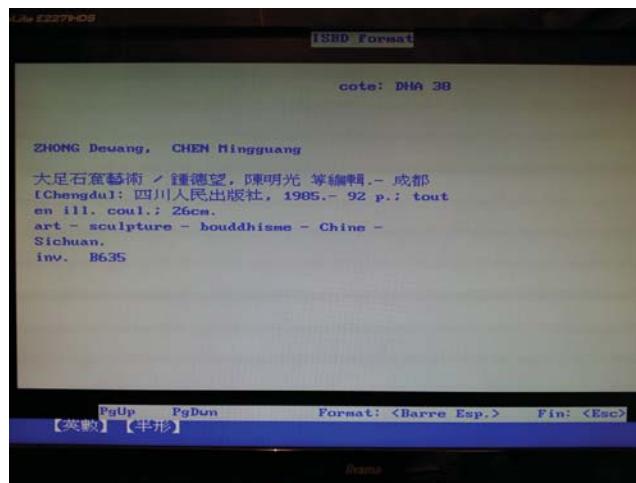
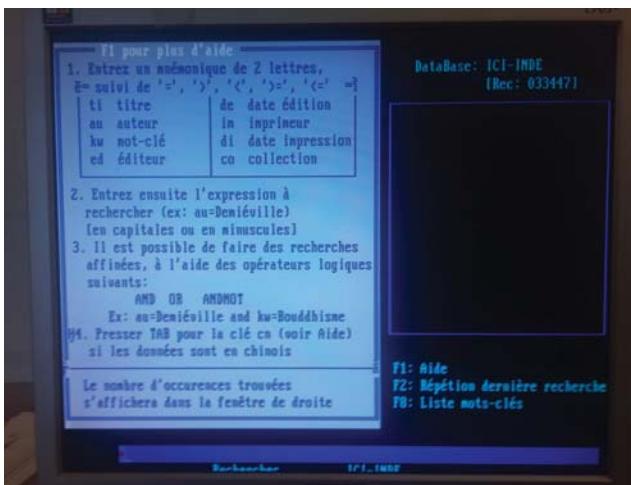
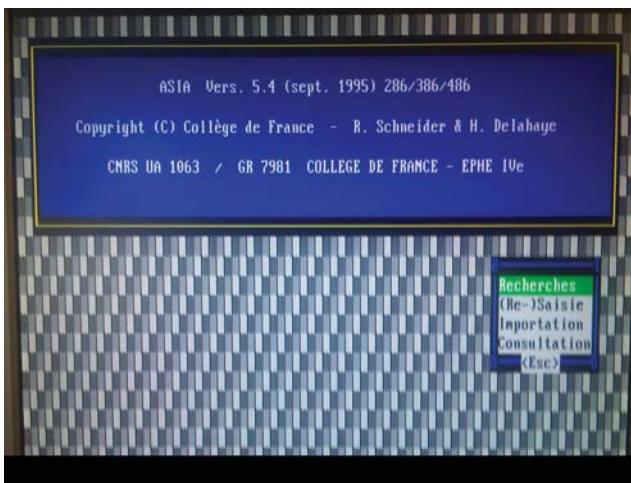
When information technology started to be used seriously in the humanities during the eighties, the presentation of Chinese, Japanese and Korean (CJK) characters in the management of Western libraries and of scientific information raised a particular technical challenge. The market for the modernization of tools for research on the Far East was deemed "marginal", and the issue aroused little empathy among computer experts and librarians used to previous practices, who were apprehensive about this new, perhaps exotic, environment. Problems included deciding between traditional Chinese characters and those simplified by the writing reform, between several encoding standards for each of them, and several possible transcriptions and formats. Unicode was still just a project on paper and Internet was in limbo. A common denominator had to be found, and the most upgradeable, most sustainable and cheapest solution had to be adopted.

From autumn 1983, the US network RLIN in Stanford published its first bibliographies in CJK characters. The resources mobilized to do so, including human resources, were largely

out of the reach of French libraries. The personal computer technology nevertheless made its way forwards: prices dropped and, shortly after 1985, it became possible to envisage that reduced engineering means, and technicians sufficiently well-versed in the oddities of these languages, would allow for a tailored application to be programmed at local level, and at a lower cost.

This was achieved, though not without a struggle. The first computerized bibliographical records that included Chinese characters – immediately printed out, just in case –, appeared in 1989 on a black and white screen at the IEO. This was owing to the Asia programme, which was to evolve through four versions during its twenty years in existence. Initially, it served only to record new entries in the IHEC catalogue, before it was adopted by the four other institutes.

Asia was full of disadvantages, and the earliest versions were at times temperamental. Users sometimes had to be crafty, and deal with bugs. Without a local network, the application could run only as a single-user version, which required coordination in the collection, reviewing and the compilation of the bibliographic records. Likewise, indexing fields based on the first word only soon raised issues. Since Chinese authors' surname often precedes their first name, Asia was programmed so that they would automatically be entered into the index in this way. However, given the reverse custom in Western books, the index search was falling upon the authors' first names. The index entry therefore had to be written in the Chinese way with the surname first, thus bending the rules used for indexing Western books. There were other deviations from the customs of the Unimarc cataloguing format, but on the whole this new programme was a revolution. We were becoming modern. On a European scale, we were among the very first to offer bibliographical records with their original scripts in addition to the *pinyin* transliterations. The 5,000-records mark was soon reached, but at least another 150,000, if not more, remained to be done, given the Chinese taste for text collation and collection. Some of these *collectanea* included hundreds of titles that all required content fields. This was dizzying and a little demoralizing.



Thus began a period of intense search for financial resources. *Audaces fortuna juvat!* They came from the CNRS project Catalogue Collectif des Ouvrages (CCO), and, of course, from the Collège de France too. Although this was nonetheless too little, the enterprise gained momentum during the nineties. Towards 2005, Asia was nearing 70,000 records with Chinese. There were as many in the other four catalogues, where Japanese with Japanese characters and Korean with Korean characters had made their appearance in 1993, the year in which records started to be derived from Japanese CD-ROMs – another modern technology.

In the meantime, the Internet had also gained momentum. Yet until 1995, still no European counterpart institution had uploaded their library catalogue. Then appeared the tool, the providential solution developed by the CCO: a server with the bibliographies of associated laboratories that would allow not only for full records to be displayed, but also for Latin, Chinese, Japanese and Korean characters all to be used for querying. This was a European first, which caused a sensation at that year's symposium of the European Association of Sinological Librarians (EASL) in Zurich.

Those seem like distant times, and adventure seems to have somewhat disappeared from the picture. In 2009 the IEO catalogues were paired with another program, Aleph, which is net-

worked and includes all the Collège de France Libraries. This is heavy-weight software, as refined, precise and reliable as an atomic clock, which can effortlessly and normatively process books in Tibetan or in Devanagari and, generally speaking, all the documents that were unsuited to Asia's rustic processing.

The IEO have contributed over 200,000 bibliographic records to the Collège de France general catalogue, and the retrospective catalogue of the IHEC is nearing completion. Some of its references are extremely rare, and few theses on classical sinology can be written without their authors having recourse to its services. These are the latest developments, but technology has yet not said its final word. There will be other changes. Sooner or later the IHEC catalogue will join another, vaster and more universal catalogue. We hope that younger librarians will find their share of adventure. A lot can still happen but for now, Asia has left and has taken a generation with it. It feels like being aboard an old sinking ship. ■

**Hubert DELAHAYE**

Source: *La lettre*, no. 38, June 2014

**Hubert DELAHAYE**  
Far East Institutes,  
Collège de France



# A Collection of the Collège de France Institute of Advanced Chinese Studies

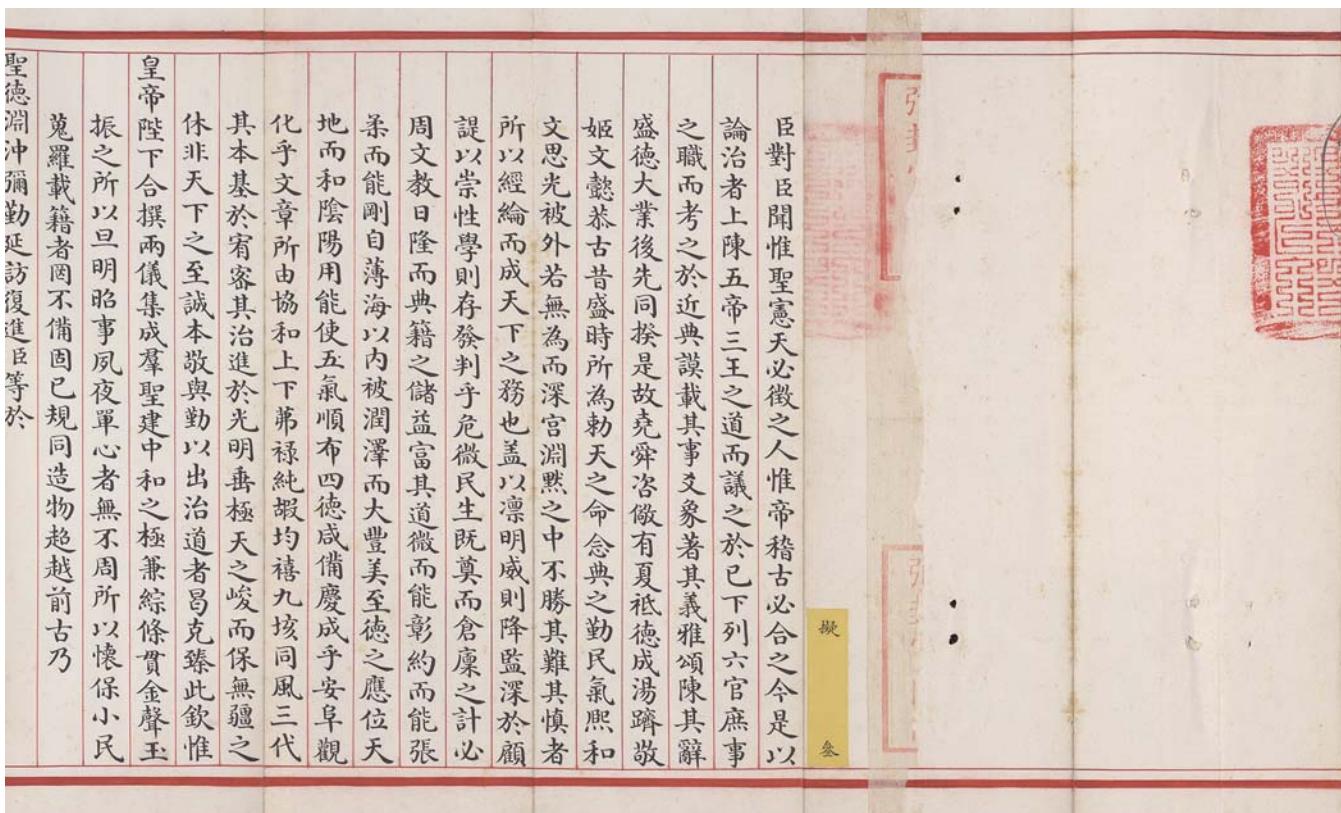
**The library of the Institute of Advanced Chinese Studies holds 33 original papers from the Palace Examination (dianshi 殿試) dating from the Qing Dynasty (1644-1911).**

The Palace Examination was first established under the Song Dynasty (960-1279) by the Taizu Emperor 太祖 (r. 960-976). This new examination followed the Metropolitan Examination, set up by the government, and was designed to bind the empire's future civil servants more closely to the Emperor himself. Under the previous Tang Dynasty (618-907), the laureates of the Metropolitan Examination (the last and most difficult examination, which took place after those at the prefectural and provincial levels) remained very close to their examiners and were often obligated directly to them. Strong factionalism resulted from this, which the Emperor controlled only with great difficulty. This new examination would leave successful candidates indebted to the Emperor for their titles and posi-

tions, thus imposing on them loyalty to the Emperor and the dynasty. The technique seems to have proven efficient, even though the Emperors' more autocratic style from the Song Dynasty onwards also contributed to the greater loyalty shown by high-ranking officials.

Under the Ming (1368-1644) and the Qing Dynasties, the Metropolitan Examination was followed by the Palace Examination and officially held every three years. However, they were actually many additional sessions. Under the Qing Dynasty, Palace Examinations took place from 1652 to 1904.

The Palace Examination was held on the twenty-first day of the fourth lunar month in the Baohe Hall (Baohe dian 保和殿) of the Forbidden City in Beijing. The candidates had to write a dissertation answering four questions asked by the Emperor himself on current or administrative issues. From 1781 onwards, the papers had to be handed back by dusk. Each paper was reviewed and graded by eight examiners (this number sometimes varied). These examiners were high-ranking



Shen Qingzao's 沈清藻, 1775 examination paper. The candidate was successful and was ranked third (tanhua 探花)

officials. There were five grades: an empty circle meant 100%, i.e. an excellent paper; an inked-in circle meant 80%, a very good paper; a triangle meant 60%, a good paper; a line meant 40%, an average paper; and a cross meant 20%, a poor paper. Each examiner would write his name above the grade he gave. The grades were then added up to get the final score for each paper. The process lasted for three days, during which, to avoid any corruption, the examiners had to sleep inside the Palace. Among many hundred papers, they had to select the ten best, rank them and submit them to the Emperor. Intense disputes between the examiners surrounded the selection process: at the end of the Qing Dynasty, it was thus decided that only the papers awarded 100% by every examiner would be included in the top ten. At dawn on the twenty-fourth day of the fourth month, the top ten best papers were presented to the Emperor, who would read and rank them, according to the ranking suggested by the examiners or in a different order, if he so pleased.

The successful candidates received the title of doctor (*jinshi* 進士). The laureates were ranked into three groups. The first class (*yi jia* 一甲) was comprised of the top three successful candidates (respectively called *zhuangyuan* 索元, *bangyan* 榜眼 and *tanhua* 探花), who received the title of *jinshi jidi* 進士及第 and would directly enter the Hanlin Academy.<sup>1</sup> Successful candidates in the second class (*er jia* 二甲) received the title of *jinshi chushen* 進士出身 and would be awarded a position as a high-ranking official in a government bureau in the capital or an official post

in the provinces. Finally, successful candidates in the third class (*san jia* 三甲) received the title of *tong jinshi chushen* 同進士出身 and were given a position according to availability (they sometimes had to wait several years). That is why, from the reign of Emperor Yongzheng 雍正 (r. 1722-1735) onwards, an additional examination, the “Court Examination” (*chaokao* 朝考), was set up and took place at the Hanlin Academy, after the Palace Examination. The successful candidates would also be ranked in several classes, leading to different types of appointments.

Results were made public on the twenty-fifth day of the fourth month, during a ceremony called the “calling of the names” (*chang ming* 唱名), held inside the Forbidden City in the Taihe Hall (*Taihe dian* 太和殿), in the presence of the Emperor, the laureates and all the high-ranking officials of the capital. The following day, a banquet was offered to honour the laureates and thank the examiners. Three days later, on the twenty-eighth day of the fourth month, the new graduates would stand in line in front of the Gate of Perfect Harmony (*Zhonghemen* 中和門) and pledge allegiance to the Emperor by bowing down in the direction of the imperial residence and thanking the sovereign for the diploma and the banquet. The Emperor in person would then give each graduate official clothes, money and other gifts. On the first day of the fifth month, all new graduates would gather at the Confucius Temple, in the Imperial University, to pay their respects to the ancient sages. The Ministry of Rites would then ask the Emperor to have a stele erected inside the Imperial University, listing the names of all the successful candidates. New graduates were also allowed to erect an archway (*fang* 坊) in front of their residence. The local authorities or elites often paid for the expenses, happy to boast of a *jinshi* graduate from their locality.

Finally, the Office of Rites would publish a register including the Emperor's question, the papers of the first three graduates and finally the names and origin of all the successful candidates. This register was circulated throughout the empire. Some graduates would publish their paper at their own expense and have it distributed to their close relatives and acquaintances.

The original papers were archived at the Grand Secretariat. When they were transferred to the new Ministry of Education in 1909, copies of the examination papers of several famous officials were reported missing. It is a number of those missing papers that are now to be found at the Institute of Advanced Chinese Studies (IHEC) and in other collections, without, however, our being able to explain exactly how they entered the IHEC collection. ■

**Delphine SPICQ (Associate-professor at the Institute of Advanced Chinese Studies)**

*Source: La lettre, no. 39, March 2015*

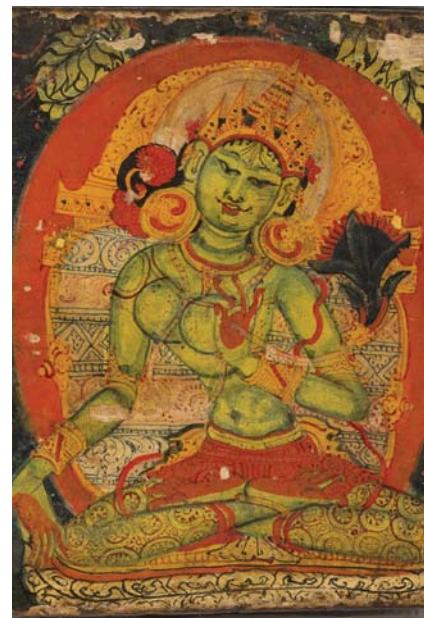
 The Collège de France Digital Archives are sponsored by the Fondation de l'Orangerie and its generous donors.

(1) The members of the Hanlin academy compiled and edited books, and drafted decrees.

# Restoration of a Treasure from the Collège de France Libraries

*The Aṣṭasāhasrikā-Prajñāpāramitā or Perfection of Wisdom in Eight Thousand Lines, India, 11th century*

One of the finest pieces of the Institute of Indian Studies heritage collections, an eleventh-century Buddhist manuscript illustrated with paintings of rare beauty, displayed very concerning signs of deterioration. Thanks to the restoration work funded by the Collège de France, this exceptional work has been saved and its full radiance recovered.



The library of the Collège de France's Institute of Indian Studies, a research library mainly dedicated to the most recent publications in this field, also preserves works of art and numerous manuscripts acquired through donations and legacies.

The oldest manuscript dates back to the eleventh century. It contains the text of *The Perfection of Wisdom in Eight Thousand Lines*, one of the main texts of Greater Vehicle Buddhism. It was gifted to the French Republic by the Nepalese Prime Minister in 1898, at the end of Sylvain Lévi's mission in Nepal [Sylvain Lévi was professor of Sanskrit Language and Literature at the Collège de France from 1894

until 1935]. *The Perfection of Wisdom* develops teachings that were unknown to Early Buddhism, also called Lesser Vehicle: the perfection of wisdom as a path towards salvation; in other words a gnosis based on the doctrine of vacuity, in which nothing can be asserted about beings, objects and ideas because their true reality, if it exists, lies beyond our understanding.

Like many treatises of the Greater Vehicle, this text in itself gave rise to a form of worship, for making or funding copies of it was an eminently pious and meritorious act. The Institute of Indian Studies' copy is among the most ancient known ones. Its presentation is typical of ancient Indian and South-



East Asian books: it is written on palm leaves bound by thongs threaded through each page, and protected by wooden boards which are often sculpted or painted. The wooden covers of the Institute of Indian Studies' copy show the five Jina (the cult's most important Buddhas) and four salutary Tārā goddesses, as well as certain scenes from Buddha's past lives.

The manuscript is one of the rare remaining testimonies of painting from eastern India (Bihar and Bengal) from the pāla era (eighth to twelfth centuries), which strongly influenced Nepalese and Himalayan art. Its history underlines one of the pathways of this influence, as it was probably produced in Patna or Bengal for a Nepalese devotee, or brought to Nepal by a monk or a traveller.

Its rareness is what makes this document so exceptional. The most ancient palm-leaf manuscripts have mostly disappeared in India, where they have been destroyed by insects, rodents, and the humidity of the monsoon periods. This one, preserved by the altitude and relatively dry climate of the Kathmandu Valley, was however in a poor condition: palm-leaves were stuck together, there were galleries of xylophagous insects and mud deposits, and the wooden covers were encrusted. Moreover, the dry air of our French libraries meant that the pages, which were dehydrated, could no longer be handled without crumbling. With the support of the Collège de France's Documentary Networks and Partnerships Division, the library of the Institute of Indian Studies commissioned an expert's assessment of the deterioration (report by M. Thierry Aubry of the BnF) and then contacted several restorers.

After examining the different proposed protocols, the manuscript was entrusted to the workshop of Marie Messager, a graphic art restorer, in partnership with the wood painting specialist Émilie Masse. One by one, each of the 203 palm-leaves, softened and flattened through humidification, was cleaned and consolidated with Japanese paper impregnated with cel-

lulose ether and set with wheat starch paste. The leaves were unstuck, and the ripped fragments adhering to the next palm-leaf were removed and set back in their original place.

After several preliminary tests with different solvents, human saliva rinsed with water was chosen to clean the wood covers, as it combines efficient action by the enzymes with a virtually neutral pH. Areas of the pictorial layer that had lifted were fixed with sturgeon glue. This delicate, long and costly process restored the radiance of the paintings, so that many formerly invisible details reappeared, for instance: the diversity of designs of the textiles, the finesse of the characters' contours, and the details in the architecture and landscape. Several strata of the pictorial layer can now also be distinguished, which will ultimately allow us to carry out a more precise study of the technique used to produce them.

A chemically neutral conditioning was designed specially, so that the manuscript could be handled safely using a system which separates the wooden covers from the palm-leaves. Once the building renovation currently underway at the Institute of Civilizations has been completed, the manuscript will be preserved in rigorously controlled hygrometric conditions.

The Institute of Indian Studies hopes soon to be able to restore another one of its treasures, namely a manuscript of the Śiva-dharma, a collection of texts partly unpublished and fundamental to the study of Śaivism, which unfortunately researchers cannot at present consult due to its poor state of conservation. ■

**Caroline RIBERAIGUA**

Source: *La lettre*, no. 38, June 2014

**Caroline RIBERAIGUA**  
Documentary Resources Manager,  
Institute of Indian Studies,  
Documentation Centre of the Oriental  
Institutes, Documentary Networks and  
Partnerships Division



The Kangyur  
of Welkhyung Gompa  
shortly after  
its rediscovery

# On the Canon Bönpo of the Collège de France Institute of Tibetan Studies

**Like the Tibetan Buddhist Canon, the Bonpo Canon is comprised of two complementary collections: the Kangyur (*bka' 'gyur*), which contains teachings attributed to the Buddha Tonpa Shenrab (*sTon pa gshen rab*); and the Tengyur (*brTen 'gyur*) which, in theory, contains commentaries on these teachings, as well as whole cycles of additional instructions, biographies, rituals, etc. This double Canon long remained an elusive object of modern Tibetology.**

The first mention of it, for example by the Russian scholar George Roerich (1902-1960), left researchers at the time more than sceptical. Later references to it made by some travellers in western Tibet at the turn of the twentieth century – with some even claiming to have seen the Canon with their own eyes – also failed to dispel the doubts of specialists working on the Bon at the time. It was not until the end of the eighties for a version of the Bonpo Kangyur to make an “official” appearance in the Nyarong region (eastern Tibet, currently the province of Sichuan). This version was prepared by Mongyal Lhasay (*sMon rgyal lha sras*, 1938–), a leading figure of the Bonsar movement, based on the manuscripts brought back from the Nagchukha region (*Nag chu kha*, eastern Tibet) by the great tertön [the revealer of treasures] Sang-ngak Lingpa (*gSang sngags gling pa*, 1865-1959?) to his monastery in Welkhyung Gompa (*Dbal khyung dgon pa*). Sang-ngak Lingpa is one of the key figures in the history of the Bonpo Kangyur. He spent whole years collecting “reading authorizations” (*lung*) from the qualified patriarchs, so as to be able to initiate a movement of full and more or less regular transmission of the Kangyur, similar to traditional Buddhist practise. In the Hor region, he met Gagya Tendar (*ga rgya bstan dar*) who gave him a complete copy of the Kangyur, which Sang-ngak Lingpa took back to the monastery in Welkhyung Gompa.



Bon is considered to be Tibet's autochthonous religious tradition.

A distinction is made between:

1. **The Old Bon** (*Bon rnying*), which dates back to the pre-dynastic era and has disappeared

2. **The Eternal Bon** (*g.Yung drung Bon*), which is the classical Bon tradition (from the tenth to the eleventh century)

3. **The New Bon or Bonsar** (*Bon gsar*), which is a late syncretic movement dating back to the fourteenth century and is highly active in eastern Tibet.



The entire collection was perfectly preserved, thanks to it being hidden in a cave near the monastery throughout the Cultural Revolution (1966-1976). Its hiding place was kept a secret for decades; some people even paid with their lives for refusing to reveal its exact location. The discovery was eventually made official around 1989-1990, and the collection was immediately reprinted at Mongyal Lhasay's initiative. It was at last possible to say that the elusive object did indeed exist. In 1992, the Collège de France acquired a copy of this version, printed on brown paper in 192 volumes thanks to Anne-Marie Blondeau, who was then head of the Institute of Tibetan studies, through Prof. Per Kvaerne of the Centre for Advanced Studies of the University of Oslo. According to Lopon Tenzin Namdak Rinpoche, over ten versions of the Bonpo Kangyur have since resurfaced. One of them (in 178 volumes) was recently scanned and digitized at the Menri monastery in exile; this digital version should be available in coming years.

The history of the Bonpo Tengyur is yet more complex. To my knowledge, while there are at least three editions of it, none of them is printed in conformity with the official catalogues of the Tengyur compiled between the eighteenth and nineteenth centuries. The first one is comprised of 300 volumes; the second of 325 volumes (the edition owned by the Collège de France); and the third of 333 volumes. Each of them includes a considerable number of texts that strictly speaking do not belong to the Tengyur, to the extent that some prefer to call that body of texts bKa' brten, in other words a mix of the Kangyur and Tengyur. Note also that each of these versions contains an impressive number of texts belonging to the late Bonsar tradition, which should theoretically not be the case. ■

**Jean-Luc ACHARD (CNRS, CRCAO)**  
Source: *La lettre*, no. 39, March 2015

 The Bonpo Canon is digitized and available on the Tibetan Buddhist Research Center website at <http://tbrc.org/#!rid=W21872> and <http://tbrc.org/#!rid=W30498>



El Castillo  
(Chichen Itza,  
Yucatan, Mexico)  
Photographic plate,  
8.5 x 10 cm, n. d.

## The Louis-Capitan Collection The Teaching of American Antiquities at the Collège de France

**The digitized iconographic resources of the Collège de France Bibliothèque générale include a remarkable body of photographs and drawings that belonged to Louis Capitan (1854-1929). This collection is now available online on the Salamandre portal (archive catalogue and digital library of the Collège de France).**

Capitan, a physician by training and once a student of Claude Bernard, was interested in prehistory, archaeology and ethnography. His archives are a good reflection of this wide range of interests. After being a professor at the School of Anthropology, Capitan taught American antiquities as a *chargé de cours*, or teaching assistant at the Collège de France from 1908 to 1929, without losing sight of his research in the European and extra-European pre- and proto-historical fields.

Many researchers with diverse competences were called upon to identify each print of the collection. Éric Taladoire, emeritus professor in pre-Columbian archaeology at the University of Paris I-Sorbonne, spearheaded this collective work, generously sharing his advice and surrounding himself with a team of people able to understand both the origin and the nature of these images. This group, which devoted itself to the collection for several months, included junior and experienced researchers, both French and from abroad. They were mainly Americanists: apart from Éric Taladoire himself, in alphabetical order there was Rosario Acosta Nieva (UMR 8096), Alexandra Biar (PhD student, Paris I), Robert Cobean (Instituto Nacional de Antropología e Historia, Mexico), Lucie Dausse (PhD student, Paris I), Nicolas Goepfert (UMR 8096), Patrice Lecoq (Paris I), Leonardo López Luján (Instituto Nacional de Antropología e Historia, Mexico), Pascal Monge (École du Louvre), and Jane Walsh (Smithsonian Institution of Washington). Prehistorians such as Boris Valentin (Paris I), Gilles Tosello (UMR 5608) and Camille Bourdier (Toulouse II), as well as an Orientalist archaeologist Guillaume Gernez (Paris I), joined the team that carried out this identification work. The Louis-Capitan Collection is comprised of over 2,000 pictures from across America. Alongside Mexican and Andean Collections, a significant part of the collection concerns the American South-West and the cultures of the Mississippi Basin mound builders. Many high-quality archaeological objects are found alongside pictures of Mexican temples barely cleared of the vegetation that long covered them. The core sites of Mayan civilization are those photographed most extensively (Copán, Chichen Itza, Uxmal, Palenque, etc.). These are precious images, in so far as they depict some



Discovery of the  
monumental statue  
of Tlaloc, Aztec god  
of rain. Coatlinchan  
(Mexico).  
Photographic plates  
and stereoscopy.



of the monuments at the time of their discovery, before their restoration. Likewise, some reliefs appear *in situ*, before they were transferred to different archaeological museums. This collection reflects Capitan's teaching, which often concerned the everyday lives of the ancient inhabitants of America. The iconographic repertoire did not only include ceramics (particularly from the *Mochicas* in Peru); it also abundantly featured fabrics, jewellery, mortars, and axes. While Capitan did not always observe the principle of archaeological series, he definitely strongly emphasized material culture. Photographs also reveal his comparativist perspectives, which range from Bochiman paintings to early shots from Polynesia and Easter Island, etc.

In order to multiply and diversify the material he showed in his lectures, Capitan used glass plates to draw several figures or glyphs found in the main *codices* that provide information on the history of Ancient Mexico: the Mayan *codex* Troano, the Mendoza, the Ramirez, the Telleriano Remensis, etc. He also sketched, in black and white or in colour, types of housing, site maps, landscapes, and botanical or geological curiosities. This corpus of sketches sheds light on a little-known aspect of Capitan's interests: he retraced the itinerary followed by the Légion Étrangère during the French intervention, which culminated in the Battle of Camarón.

The Louis-Capitan Collection contains a few gems. For example, we find in it the images of an exceptional statue, found in Coatlinchan, representing Tlaloc, the Mexicas' god of rain, before it was moved to the Museum of Mexico, where it holds a place of honour at the entrance. There is also a previously unknown portrait of Adela Breton (1849-1923), one of Capitan's contemporaries, a great traveller who became an expert in Yucatan paintings, and a major figure among specialists on

the Mayan world. The collection furthermore holds a series of photographs illustrating the discoveries of the Mexican archaeologist Leopoldo Batres in the las Escalerillas street in Mexico, one of the first collections relating to the archaeology of the Aztec capital. Special attention should be paid to a few pictures devoted to the objects taken back to California by Léon de Cessac (1841-1891): these collections are nearly unique worldwide, and documents illustrating them are truly rare.

More generally, these photographic plates convey the state of Americanist science in the early twentieth century, at a time when Europeans still dominated the discipline, before passing on the torch to their American colleagues after the Great War. They help understand Capitan's work notes and other course and lecture preparations. They are also available on Salamandre, since they were moved from the IMEC to the archives of the Collège de France. ■

**Claire GUTTINGER (Documentary Networks and Partnerships Division)**

**Sarah REY (Lecturer)**

Source: *La lettre*, no. 39, March 2015



The Louis-Capitan Collection has been digitized with the support of the Fondation de l'Orangerie and its generous donors.

# The François-Franck Collection

## Studying emotions in the early 20th century



Charles-Émile François-Franck, Collège de France's Archives.

**The Collège de France archives hold a large collection of photographic plates devoted to the expression of emotions. These plates were initially erroneously attributed to Pierre Janet (1859-1947), Professor of Experimental and Comparative Psychology from 1902 to 1934. In 2011 they were digitized, to preserve them and to make them widely available.**

An in-depth study determined that they were actually produced and collected by Charles-Émile François-Franck (1845-1921), Chair of Natural History of Organized Bodies from 1905 to 1921, and then given to the Collège de France by the psychologist George Dumas (1866-1946). The 780 photographic plates are now online on Salamandre, the Collège de France's archive catalogue and digital library. The plates have been analysed and re-examined in light of recent research on the history of psychiatry and photography.

This collection was constituted initially for a series of lectures by François-Franck in 1900 and 1901: "The Expression of Emotions in a Normal and Pathological State", and "How articulated Language and Mimicry are related Emotions". In those years, he was standing in for Étienne-Jules Marey Chair of Natural History of Organized Bodies (1869-1904), already a precursor in the use of photography for medical purposes. François-Franck, a doctor by training like his senior, took a new direction when he turned to psychology at the beginning of the twentieth century.

These plates include photographs of "lunatics", mainly from the Villejuif asylum, along with anatomical charts, portraits of professional actors and of blind and deaf-mute persons, as well as copies of works of art. Facial features and postures, captured live, seem to have been a major area of interest of François-Franck, who often looked for the "secret" of emotions in art.

Psychiatry and art have been closely inter-related for centuries. Consider for instance the "monomaniac" portraits painted by Théodore Géricault in the early nineteenth century, at the request of Étienne-Jean Georget, a doctor practising at the Salpêtrière hospital. Charcot pursued this "optical" reflection by studying masterpieces representing pathologies to diagnose

them *a posteriori*. Likewise, François-Franck's archives bring together, for example, a copy of *The Vision of Saint Jerome* (ca. 1619-1620) by Guercino, the image of a double visual and auditory hallucination, and *The Money Changer and his Wife* (1514) by Quentin Metsys, to identify a simple character trait (avarice), and perhaps the start of a disease. François-Franck extended his visual curiosity to the inclusion, in this clinical and artistic repertoire, of pictures of animals as well as primitive artwork (Asian masks and Amerindian statuettes).

In April 2013, the return of the François-Franck paper archives, entrusted to the IMEC (Institut Mémoires de l'édition contemporaine) in 2000, was of great help in understanding and contextualizing these images. Many illustrated lecture notes and photograph albums annotated by François-Franck allow us to retrace the professor's experimental and teaching approach, as it was presented to the audience during his lectures.

These archives will be of interest not only to psychologists and psychiatrists wishing to return to the origins of their practices, but also to historians of confinement and insanity inspired by Michel Foucault's work. Specialists of the techniques and uses of photography will discover portraits inspired by the work carried out by Duchenne de Boulogne or Albert Londe, pioneers of medical plates. This collection will also command the attention of historians of late nineteenth-century theatre, since some of the images depict famous actors of the time, asked to mime certain expressions exaggeratedly. ■

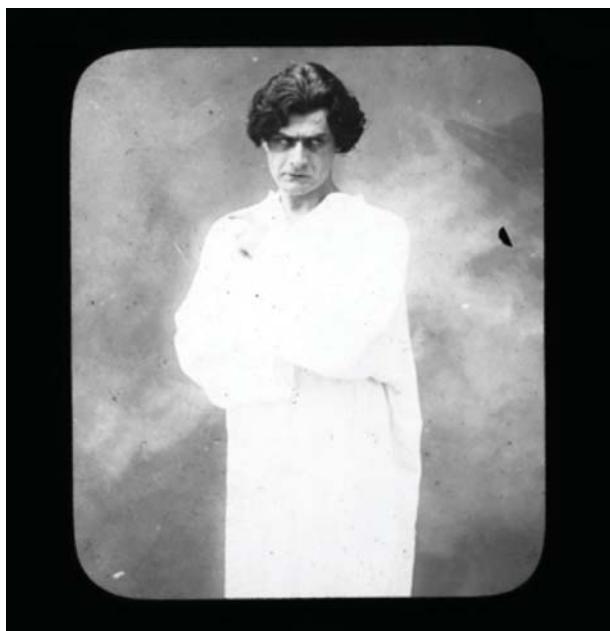
**Sarah REY**

Source: *La lettre*, no. 38, June 2014

- To begin to shed light on this collection, a study day attended by art historians, historians of science and philosophers was held at the Collège de France on 3 June 2014.
- The inventory of the François-Franck archives and the digitized plates are available on Salamandre (<https://salamandre.college-de-france.fr>). Most of the plates are freely accessible, but some of them can be consulted only for research purposes.



A "lunatic" photographed to illustrate François-Franck's lecture,  
Collège de France Archives



The actor Édouard de Max miming the emotion relating to command,  
Collège de France Archives

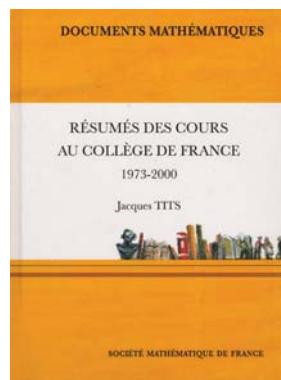
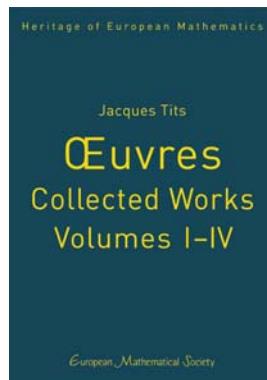
**Sarah REY**

Lecturer, University  
de Valenciennes  
et du Hainaut Cambrésis



## PUBLICATIONS JACQUES TITS

# Publication of Jacques Tits' Work



Jacques Tits, promoted to Officer of the Légion d'honneur in 2008.

Two major publications honour Jacques Tits' work. In November 2013, four volumes of his *Œuvres-Collected Works. Volumes 1-IV*, comprising all the articles he wrote between 1949 and 2006, were published by the European Mathematical Society. Also at the end of 2013, the Société Mathématique de France published his *Résumés de cours au Collège de France* (1973-2000). This volume is a collection of the abstracts he published annually in the yearbook *Cours et travaux du Collège de France*. It describes either the work of other mathematicians (particularly that of Grigory Margulis and Robert Griess), or their original results, many of which have not been published elsewhere.

These publications attest to the originality of Jacques Tits' ideas, and to their many applications. These ideas are rooted in his earliest work, carried out in Brussels around 1950, when he sought to translate into geometric language (his preferred language) some of the constructions of group theory, in Élie Cartan's and Hermann Weyl's vein. This led him to invent the notion of "building" (with constituents named "chambers", "apartments", etc.), which was to prove crucial for questions seemingly remote from the initial project. The classification of these objects kept him busy almost until the end of his teaching at the Collège de France, in 2000.

We also owe him magnificent isolated results, like the "Tits' alternative", which claims that a finite linear group only has two very different possibilities: it is either solvable (to the nearest finite group), or free non-abelian (to the nearest finite group). There is no middle ground! ■

**Prof. Jean-Pierre SERRE**

Source: *La lettre*, no. 38, June 2014

### Two Abel Laureates at the Collège de France

The Abel prize, created in 2002 and awarded by the Norwegian government, is considered to be the highest international distinction in mathematics. Two Collège de France professors have been awarded this prize. Jean-Pierre Serre, Chair of Algebra and Geometry from 1956 to 1994, received the Abel prize in 2003, the first year it was attributed, for "playing a central role in the elaboration of the modern form of several domains of mathematics like topology, algebraic geometry and number theory" (see *La lettre du Collège de France*, no. 8, July 2003, p. 15).

It was Jacques Tits' turn to receive this prestigious scientific award in 2008. The Abel prize was awarded to him and to US mathematician John Griggs Thomson, by King Harald V of Norway "for their work in the formation of modern group theory" (see *La lettre du Collège de France*, no. 23, June 2008, p. 19).



**Prof. Jean-Pierre SERRE**  
Emeritus Professor,  
Chair of Algebra and Geometry  
(1956-1994)

\*Following Jacques Tits' case, André Miquel, Collège de France Administrator from 1991 to 1997, aimed to open the Chairs of the Collège de France to foreign professors, which he was able to do in 1992.

## PUBLICATIONS

### INAUGURAL LECTURES Printed and Online

**Gilles BŒUF**, *La biodiversité, de l'océan à la cité*, Paris, Collège de France/Fayard, no. 241, 2014  
<http://books.openedition.org/cdf/3607>

**Tony CRAGG**, *Sculpture et langage*, Paris, Collège de France/Fayard, no. 238, 2014 <http://books.openedition.org/cdf/3585>

**Alain DE LIBERA**, *Où va la philosophie médiévale ?*, Paris, Collège de France/Fayard, no. 244, 2014  
<http://books.openedition.org/cdf/3615>

**Alain FISCHER**, *Médecine expérimentale*, Paris, Collège de France/Fayard, no. 248, 2014  
<http://books.openedition.org/cdf/3701>

**Frantz GRENET**, *Recenter l'Asie centrale*, Paris, Collège de France/Fayard, no. 239, 2014  
<http://books.openedition.org/cdf/3590>

**Pierre-Michel MENGER**, *La différence, la concurrence et la disproportion. Sociologie du travail créateur*, Paris, Collège de France/Fayard, no. 242, 2014  
<http://books.openedition.org/cdf/3611>

**Sanjay SUBRAHMANYAM**, *Aux origines de l'histoire globale*, Paris, Collège de France/Fayard, no. 240, avril 2014  
<http://books.openedition.org/cdf/3599>

**Jean-Marie TARASCON**, *Chimie du solide et énergie. Exemples et avenir d'une science millénaire*, Paris, Collège de France/Fayard, no. 243, 2014

**Philippe WALTER**, *Sur la palette de l'artiste. La physico-chimie dans la création artistique*, Paris, Collège de France/Fayard, no. 245, 2014 <http://books.openedition.org/cdf/3706>

### ELECTRONIC RE-EDITIONS

**Gérard FUSSMAN**, *Histoire du monde indien*, Paris, Collège de France, no. 96, 1985. <http://books.openedition.org/cdf/780>

**Alain PROCHIANTZ**, *Géométries du vivant*, Paris, Collège de France, no. 194, 2008. <http://books.openedition.org/cdf/3415>

### ONLINE ENGLISH TRANSLATIONS

**Antoine COMPAGNON**, *What is Literature for?*, Paris, Collège de France, 2014, <http://books.openedition.org/cdf/3314>

**Marc FONTECAVE**, *Chemistry of Biological Processes: An introduction*, Paris, Collège de France, 2014,  
<http://books.openedition.org/cdf/3336>

### PHILOSOPHY OF KNOWLEDGE at the Collège de France Online Collection

**Jean-Mathias FLEURY** (ed.), *Leibniz et le principe de raison. Enjeux théoriques et pratiques*, Collège de France, 2014,  
<http://books.openedition.org/cdf/3660>

**Claudine TIERCELIN**, *La métaphysique et les sciences. Les nouveaux enjeux*, Collège de France, 2014,  
<http://books.openedition.org/cdf/3684>

**Claudine TIERCELIN**, *The Pragmatists and the Human Logic of Truth*, Collège de France, 2014,  
<http://books.openedition.org/cdf/3652>

### LA LETTRE DU COLLÈGE DE FRANCE Printed and Online

La lettre du Collège de France, no. 38, June 2014, [www.college-de-france.fr/site/lettre-du-college-de-france/Lettre-n-38\\_1.htm](http://www.college-de-france.fr/site/lettre-du-college-de-france/Lettre-n-38_1.htm)

La lettre du Collège de France, no. 39, March 2015, [www.college-de-france.fr/site/lettre-du-college-de-france/Lettre-n-39.htm](http://www.college-de-france.fr/site/lettre-du-college-de-france/Lettre-n-39.htm)

### COLLÈGE DE FRANCE NEWSLETTER Printed and Online

*Collège de France Newsletter*, no. 8, 2013/2014,  
[www.college-de-france.fr/site/en-publications/newsletter-8.htm](http://www.college-de-france.fr/site/en-publications/newsletter-8.htm)

### OTHER PUBLICATIONS

**Alain BERTHOZ**, *La Vicariance. Le cerveau créateur de mondes*, Odile Jacob, « Sciences », 2014

**Antoine COMPAGNON**, *Baudelaire l'irréductible*, Flammarion, « Littérature & Essais littéraires », 2014

**Antoine COMPAGNON**, *1966, Annus mirabilis*, Gallimard, 2012

**Antoine COMPAGNON**, *Lire et relire Proust*, Cécile Defaut, publié avec le soutien du Collège de France, 2014

**Philippe DESCOLA**, *La Composition des mondes. Entretiens avec Pierre Charbonnier*, Flammarion, « Documents et essais », 2014

**Jean-Marie DURAND**, **Thomas RÖMER**, **Micaël BÜRKI**, *Comment devient-on prophète?*, Actes du colloque organisé par le Collège de France, Paris, 4-5 April 2011, Vandhoeck & Ruprecht, « Orbis Biblicus et Orientalis », 2014

**Michael EDWARDS**, *Le Génie de la poésie anglaise*, Les Belles Lettres, « Essais », 2014

**Serge HAROCHE** (Introduction), **Pierre ROSANVALLON** (ed.), *Science et démocratie*, Actes du colloque de rentrée du Collège de France 2013, Odile Jacob, « Colloque annuel du Collège de France », 2014

**Carlo OSSOLA**, *Érasme et l'Europe*, Éditions du Félin, « Le Félin Poche », Paris, 2014

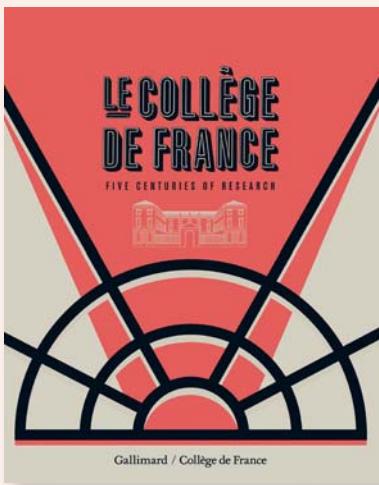
**Jesper SVENBRO & John SCHEID**, *La tortue et la lyre. Dans l'atelier du mythe antique*, CNRS Éditions, « Histoire antique », Paris, 2014

**Jacques THUILLIER**, *Une vie pour l'histoire de l'art*, Les écrits de Jacques Thuillier, tome I, Éditions Faton, 2014

**Jacques THUILLIER**, *La peinture française au XVII<sup>e</sup> siècle*, Les écrits de Jacques Thuillier, tome II, Éditions Faton, 2014

**Nathan WACHTEL**, *Des archives aux terrains. Essais d'anthropologie historique*, Seuil/Gallimard/EHESS, « Hautes Études », 2014

**Michel ZINK**, *D'autres langues que la mienne*, Odile Jacob, « Collège de France », Paris, 2014



► The book is available in French and in English  
<http://www.gallimard.fr/Catalogue/GALLIMARD/Hors-serie-Connaissance/ePub-Fixed-Layout/Le-College-de-France2>

As a haven for open discussion and investigation, the Collège de France has a special place in the academic world, both in France and abroad. Always in step with the evolution of knowledge, the institution has nonetheless remained true to the spirit of freedom and independence that has characterized it since it was founded in 1530. Over the years, its professors have brought this monument of knowledge into being; today, three of them have tackled the task of recounting its past and recording its present.

Antoine Compagnon, Pierre Corvol and John Scheid provide a behind-the-scenes view of a unique institution that continues to combine tradition and modernity.

#### **Antoine COMPAGNON**

Modern and Contemporary French Literature

**Pierre CORVOL** Experimental Medicine (1989-2012), Collège de France Administrator (2006-2012)

**John SCHEID** Religion, Institutions and Society of Ancient Rome, Collège de France Vice-Administrator

*Le Collège de France*  
*Cinq siècles de libre recherche*  
Éditions Gallimard/Collège de France  
May 2015, 176 p. 185 x 230 mm

The publication of the book *Le Collège de France. Five centuries of research* was marked by a round table with the authors, held on 27 May 2015, in the presence of Serge Haroche.

Discussions were preceded by a short film (Pathé cinéma) on Joseph Bédier's 18 June 1931 speech inaugurating the Collège de France's fourth centenary ceremonies. The authors then reviewed the origins of the partnership with Éditions Gallimard (the idea of publishing a book on the Collège de France had been put forward in 1993 by Marc Fumaroli), and the difficult choices they had to make in synthesizing the full richness of this centuries-old institution. The audience, including many professors, was invited to discuss with the authors the various topics covered by the book, for instance the Collège's "founding legend", the audience's role, and the unique documents relating to the Second World War that are kept in the Collège de France archives.

## The Collège de France Digital Campus in Chinese 法蘭西學院中文版的數碼校園

The Chinese version of the Collège de France website went online in April 2014.

Chinese-speaking users thus have access to a search engine in their own language and to content that is sub-titled and/or dubbed in Chinese. Content that has not yet been translated into Chinese is available in both English and French.

Content in Chinese includes: a presentation of the institution by Prof. Serge Haroche, Collège de France Administrator (text and video subtitled in Chinese); a presentation of the Institute of Advanced Chinese Studies and its library; a timetable of the lectures, symposia and seminars related to Anne Cheng's Chair (Intellectual History of China); videos, dubbed in Chinese, of the lecture series delivered by Anne Cheng from 2010, and the 2013/2014 lecture series by Pierre-Étienne Will (History of Modern China, 1991-2014), as well as videos of the symposium organized by Pierre-Étienne Will, in 2014, on "Jean-Pierre Abel-Rémusat and his Successors. Two Hundred Years of French Sinology in France and China". This represents a total of 81 hours of lectures.

The website home page provides links to the Collège de France's most recent lectures in all disciplines, which are translated into English.

The translation of the website into Chinese was possible thanks to the Bettencourt Schueller Foundation's generous support.

