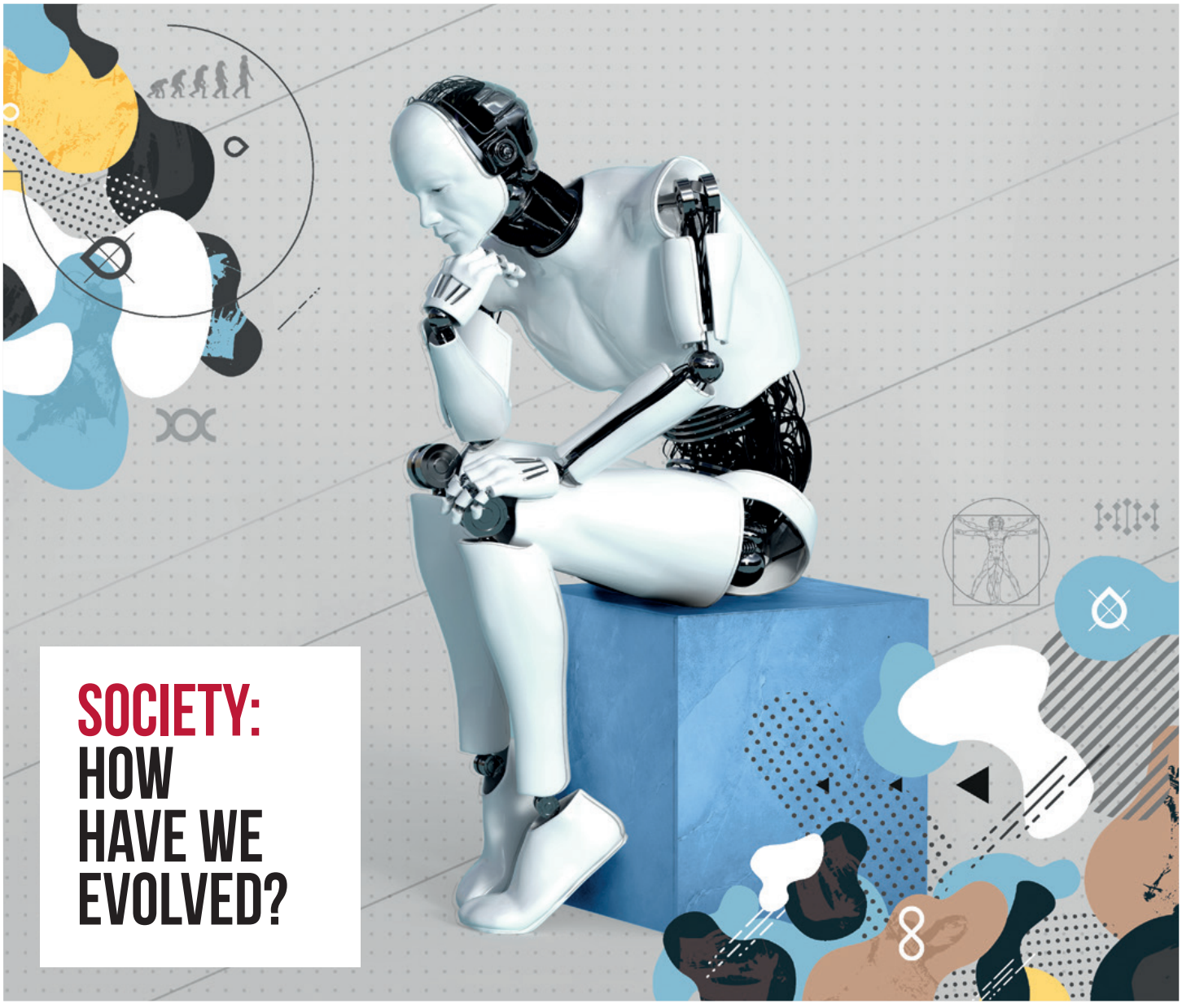
IAST CONNECT #9

Winter 2016

INSTITUTE FOR ADVANCED STUDY IN TOULOUSE



SOCIETY: HOW HAVE WE EVOLVED?

HIT OR RUN: SELF-DRIVING CAR ETHICS

POLITICS: THE ROLE OF SCIENCE IN THE FACE OF POPULISM

SLAVERY: SHADOWS OF THE PAST

The ambition to answer the hardest questions

It's not every year that an institute of the size and with the history of the IAST has an opportunity to welcome 13 new researchers from the very best universities in the world. These researchers will bring new ideas, unique vision, and deep knowledge to the Institute. They will participate in the constant exchange across disciplines that Toulouse encourages. You will find more information about our new members on pages 6-7 and I'm confident you will hear more about their transformative work over the coming years.

In this edition, I have the honor to introduce an in-depth dossier on Evolution and Society and how our common evolutionary past continues to define the many aspects of our daily lives. In my own work, I think about this issue a great deal – how must we live our lives today given our evolutionary history but our vastly different societies from those of our ancestors? This is one of several broad questions that IAST researchers try to answer every day and which IAST is uniquely suited to address. We know, given the connections across fields that define the strength of modern scholarship, that these questions are best answered when we study not only deeply, but broadly, and integrate our thinking across disciplines. These questions deserve to be answered collectively with all the social sciences participating in an open and free manner – in the way that the IAST makes possible.

In fact, it is when we consider some of the deepest questions about human nature and society that we recognize the important role of the IAST. It is vital to collapse interdisciplinary boundaries to do what is so hard to do but must be done – to learn to speak to others who think differently from us intellectually because we know that what emerges from such discussions and the research that results is infinitely exciting and likely to advance our thinking. It is this ambition to strive for innovative ways of conducting research that makes the IAST so indispensable today. I hope this issue will showcase the increasing relevance of the Institute for Advanced Studies in Toulouse and wish you pleasant reading that, I hope, will also change how you think about human nature in modern societies.

Mahzarin R. Banaji
• Harvard University
• Member of the IAST Scientific Council

IAST CONNECT #9
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- Commissioning editor: Paul Seabright
- Editor-in-chief: Jennifer Stephenson
- Production manager: Jean-Baptiste Grossetti
- Editorial contributions: James Nash
- Iconography: © Fotolia - © Studio Tchiz - © Wikimedia
- ISSN number in waiting
- Graphic design, layout: Agence Yapak, www.yapak.fr
- Environmentally friendly printing in France by Indika Iso14001 - Imprim'Vert - 25 chemin du Chapitre 31100 Toulouse - France - www.indika.fr
- Circulation: 2000 copies

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IAST in action

FLASHBACK TO RECENT EVENTS

FREEDOM AND CONTROL OF DIGITAL EXPRESSION

13 OCTOBER 2016

SOCIOLOGY, POLITICAL SCIENCE

Led by IAST researcher Jen Schradie, this conference supported by the Jean-Jacques Laffont Digital Chair saw some of the best specialists on digital movements detail their latest work.

INTERGENERATIONAL TRANSFERS AND THE GREAT RECESSION

16 SEPTEMBER 2016

ECONOMICS, BIOLOGY

Donald Cox (Boston College) studied private transfers during the Great Recession and his work suggests they have functioned like social insurance for some households, but not for all.

A REPRESENTATION OF DECISION UNDER RISK AND CERTAINTY

7 OCTOBER 2016

BIOLOGY, ECONOMICS

Agnieszka Tymula (University of Sydney) came to IAST to present her latest work on the scientific understanding of how individuals make decisions.

COLONIZATION AND CHANGING SOCIAL STRUCTURE: EVIDENCE FROM KAZAKHSTAN

30 SEPTEMBER 2016

ECONOMICS, HISTORY

Gani Aldashev (Université Libre de Bruxelles) presented his work on the Russian colonization of the kazakh steppes in the late 19th century and how it influenced the evolution of Kazakh institutions.

DOMESTIC VIOLENCE IN BRAZIL

12-13 SEPTEMBER 2016

ANTHROPOLOGY, ECONOMICS

IAST research fellow Jonathan Stieglitz presented the first results from a project aiming to decipher domestic violence in Brazil through a statistical analysis of the phenomenon.

IAST in the press

WHY DO WE TRUST OTHERS?

LE MONDE • ASTRID HOPFENSITZ

Astrid Hopfensitz talks about her work and behavioral economics in a video published by *Le Monde*. She specifically details her study of trust with the help of dedicated facial recognition software able to detect the emotions in people's faces. Astrid Hopfensitz can hence try to understand how we are more inclined to trust someone based on the emotion displayed. Astrid Hopfensitz is in charge of the Psychology program at IAST and the video is part of an ongoing series of researcher profiles.

ECONOMICS, PSYCHOLOGY

WOULD YOU BUY A CAR DESIGNED TO KILL YOU?

FINANCIAL TIMES • WALL STREET JOURNAL

JEAN-FRANÇOIS BONNEFON

Jean-François Bonnefon and his work on driverless cars have been featured in many media outlets worldwide, notably the *Financial Times* and the *Wall Street Journal*. His research at the crossroad of economics and psychology led him and his co-authors to study the moral ethics of driverless cars and more specifically if people would buy cars possibly designed to kill their passengers. You can read more on the experiment and its results on pages 16-17. The researcher even invites you to take part in the survey on its dedicated website: **moralmachine.mit.edu.**

ECONOMICS, PSYCHOLOGY

WHY RESEARCHERS DIDN'T ANTICIPATE THE RISE OF TRUMP OR THE BREXIT

LE MONDE • PAUL SEABRIGHT

IAST Director Paul Seabright wrote in *Le Monde* about the complexity and challenge of deciphering and fully understanding phenomena such as the US 2016 elections or the Brexit vote. The researcher argues that those political movements are very hard to understand because their underlying characteristic is seduction. According to Paul Seabright, institutions, if they're not regularly renewed in some way, tend to be the prey of new, more seductive, ideologies.

ECONOMICS, SOCIAL SCIENCES

Jean-François Bonnefon

Luke Glowacki

Astrid Hopfensitz

Paul Seabright

HOW GROUP VIOLENCE CAN HELP EXPLAIN ISIS

YALE NEWS • LUKE GLOWACKI

IAST newcomer Luke Glowacki's work has been featured in several articles in 2016 including the New York Times and the Washington Post. His studies, recently covered by Yale News, suggest that diminishing a leader's impact in a social group may prevent an original spark of violence. The researcher studies the evolution of violence starting from the very first massacre we have evidence of, more than 13 000 years ago, and tries to understand this behavior. According to his findings, the reason behind violence is mostly to be found at the community level. Humans are hard-wired to adopt their community's norms and many communities advocate violence. Luke Glowacki even suggests that the most important predictor of violence is the detection of a cultural system rewarding warriors with social benefits.

ANTHROPOLOGY

WHAT THE LOW US UNEMPLOYMENT NUMBERS ARE HIDING

LE MONDE • PAUL SEABRIGHT

While the unemployment rate in the US has drastically decreased over the past six years, from 10% in 2010 to less than 5% today, Paul Seabright points to research indicating that there are hidden phenomena behind this transition. The researcher states that while 67.3% of the American population aged over 16 was looking for a job in 2000, this number decreased to 62.4% in 2015, an historical low. A study led by Alan Krueger (Princeton University) showed that the people who disappeared from the job market are mostly young men who didn't go to college. The share of non college-educated young men who did not work for a full year more than doubled, from 10% in 1994 to more than 20% in 2015. Statistics seem to indicate that this hidden unemployment is part of the political force that led to the election of Donald Trump.

ECONOMICS, POLITICAL SCIENCE

Meet IAST's latest recruits

The Institute for Advanced Study in Toulouse welcomed no less than 13 new Research Fellows for this new academic year. Coming from a vast array of renowned universities and disciplines, the newcomers all work at the crossroads of disciplines and are looking forward to developing new interdisciplinary research projects in Toulouse.

Kofi Asante

Northwestern University

Kofi Asante is a sociologist who recently completed his PhD at the Northwestern University. His work, at the crossroads of history and sociology, is mainly about the formation of African states in the 50s.

SOCIOLOGY, HISTORY

Vessela Daskalova

Cambridge University

Specialised in behavioral economics, microeconomics and game theory, Vessela Daskalova works on social identity and bounded rationality in strategic interactions.

ECONOMICS, PSYCHOLOGY

Alice Baniel

Université Montpellier II

After completing her PhD at the University of Montpellier II, Alice Baniel joins IAST to continue her work on the evolution of social relationships and conflicts among primates.

BIOLOGY

Lee Dinetan

IMT

Lee Dinetan is a mathematician whose work in applied mathematics is linked to economics. He recently worked on optimal investment strategies in a Markovian environment.

MATHEMATICS, ECONOMICS

Nicholas Crawford

Harvard University

Mainly an historian, Nicholas Crawford is also working of economic issues as his main domain of interest is slavery and how it has been impacted by the evolution of international food trade in the British Caribbean.

HISTORY, ECONOMICS

Mark Dyble

University College London

As an anthropologist, Mark Dyble works on the way of life of the hunter-gatherers from an evolutionary standpoint. He specifically studies cooperation and social structure among those societies.

ANTHROPOLOGY

Luke Glowacki

Harvard University

Luke Glowacki is an anthropologist working on the biological and social traits allowing humans to solve problems collectively. He also works on violence and its causes.

ANTHROPOLOGY

Gaëtan Fournier

Tel-Aviv University

Gaëtan Fournier is an economist mainly working on game theory and its applications in economics and finance.

ECONOMICS

Lucas Novaes

University of California, Berkeley

Lucas Novaes completed his PhD in political science at the University of California, Berkeley. He works on the political representation of developing countries.

POLITICAL SCIENCE

Harilanto Razafindrazaka

Université Paul Sabatier

As an anthropologist, Harilanto Razafindrazaka works on the human population of Madagascar using both genetic, cultural and linguistic points of view.

ANTHROPOLOGY

Carlos Velasco

Princeton University

Specialized in political science, Carlos Velasco's work focuses on the relationships between institutions and their responsibilities. For example, he analysed political parties in Victorian Great Britain and bureaucratic performance in India.

POLITICAL SCIENCE, HISTORY

Vittorio Merola

Ohio State University

PhD in economics and political science, Vittorio Merola works on economic inequalities and the public opinion on the subject. More generally, he studies the interactions between economic factors and psychological mechanisms.

POLITICAL SCIENCE, ECONOMICS, PSYCHOLOGY

Lauriane Rat-Fischer

Oxford University

Lauriane Rat-Fischer is interested in the developmental and evolutionary mechanisms involved in the emergence of problem-solving behaviors. Her long-term goal is to map evolved traits and developmental influences that impinge on the cognitive capabilities that underlie physical intelligence, with an emphasis on tool-use.

BIOLOGY

Evolution and Society

An important part of IAST's scientific project is to study human beings as biological organisms that have evolved by natural selection. From cell to society, each level of human complexity can be better understood with reference to our evolutionary past. This is an organizing principle of IAST's biology program, directed by **Ingela Alger.**

An exciting new collaboration led by mathematician **Adrien Blanchet** is a striking example of IAST's interactive approach. Featured on the following pages, the MuSE project (Transversalité – IDEX) will combine his skills with those of biologists, economists, physicists and computer scientists to study emergent phenomena such as fish school dynamics, group decisions and human crowds.

A particular focus of this Evolution and Society dossier is the role of dispersal, information and kin competition in the self-organization of populations. With his experiments on lizards, **Jean Clobert** has helped transform our understanding of the role of migration in sustaining meta-populations. Using data from preindustrial Finland, **Aïda Nitsch** has conducted the first study of the effect of siblings on human dispersal and reproductive success.

Meanwhile, **Arnaud Tognetti** has combined economic games with genetic analysis to study cooperation and sexual selection. He has found that men are more cooperative in the presence of women and is now testing for similar behavior in sociable weaver birds in South Africa.

In fostering such diverse and original research, IAST hopes to enhance understanding of human behavior within the dialectically interacting processes that make up the living world. ▶

What guides the invisible hand?

• ADRIEN BLANCHET •
MULTIDISCIPLINARY STUDY OF EMERGENCE PHENOMENA - MUSE

Can the swirling grace of a flock of starlings or a shoal of herring be reduced to the motion of each individual? How do ant colonies solve geometric problems? Why can't we see the swarm within a bee? From snowflakes to currency fluctuations, emergent phenomena exhibit qualities that are impossible to detect within their component parts. The study of emergence promises to reveal the interplay of dynamic processes that create the wonders of the living world and confront humanity with its most pressing concerns. With the advance of biotechnology, climate change, megacities and the age of information, the 21st century is already producing unforeseen patterns that will reshape our understanding of evolution and society.

Itself an emergent property of the clustering of brilliant minds in Toulouse, IAST is now home to an ambitious new attempt to study this elusive subject. Led by mathematician **Adrien Blanchet**, the Multidisciplinary Study of Emergence Phenomena (MuSE) will study self-organization in social and economic systems, drawing on the latest advances in biology, economics, physics, mathematics and computer science. It brings together four world-class laboratories in Toulouse and obtained IDEX funding earlier this year – an important first step toward constructing a long-term international project.

Self-organization is a major component of a wide range of collective behaviors in social insects and vertebrates. As ecologist **Jean Clobert** has shown in his experiments on lizards (see pages 12-13), the collective integration of individual knowledge can allow a species to adapt to and colonize new environments. Offering a fresh perspective on meta-populations, his work demonstrates the complex group dynamics which emerge from individual interactions.

"Economics and biology have distinct approaches to under standing societies, while physicists have powerful mathematical methods. We aim to combine all these disciplines."

"Whenever you have a multitude of individuals interacting, there often comes a moment when something new emerges: a pattern, a decision, a structure or a change in direction."

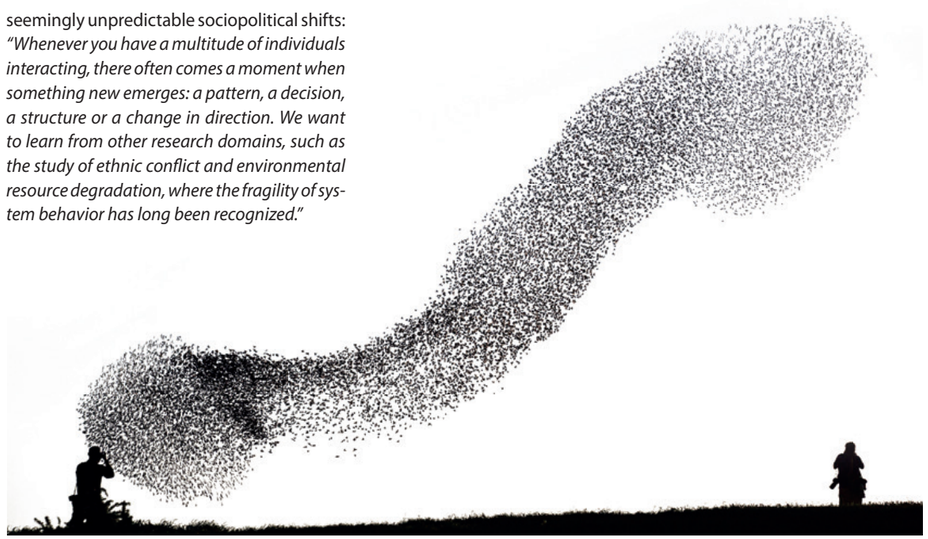
Emergent phenomena are also familiar to economists: Adam Smith's *"invisible hand"* is a metaphor for the self-organization of the market. *"It is well known that decentralized decision-making in markets can lead to efficient outcomes and information aggregation,"* explains **Adrien**. *"But the same basic principles can also have dramatic consequences, such as stock market panics, the propagation of false information and stampedes. The potential of urban populations and internet-based technologies to exacerbate such events will be an important theme of the project."*

In the wake of the 2008 crisis, the MuSE project is inspired by the need to rethink ideas about the behavior of financial systems. But it's not just economic phenomena that need explanation, says **Adrien**, it's also large and seemingly unpredictable sociopolitical shifts: *"Whenever you have a multitude of individuals interacting, there often comes a moment when something new emerges: a pattern, a decision, a structure or a change in direction. We want to learn from other research domains, such as the study of ethnic conflict and environmental resource degradation, where the fragility of system behavior has long been recognized."*

"And the thousands of fishes moved as a huge beast, piercing the water. They appeared united, inexorably bound to a common fate. How comes this unity?"
— Anonymous, 17th century

IAST regularly hosts events that bring together leading economists and biologists, and MuSE researchers will take full advantage. *"Economics and biology both study the behavior of living beings,"* says **Adrien**, *"but they have distinct approaches to understanding societies. Macroeconomic models tend to allow for complex individual behavior and mainly study static equilibria and steady states. But this comes at the cost of disregarding population heterogeneities and dynamics, which biologists tend to study by focusing on simple individual behaviors. At the same time, physicists have developed powerful mathematical methods to study the dynamics of particle systems. The MuSE project aims to combine insights and methods from all these disciplines."*

The emergent potential of this project mirrors the intellectual buzz that has been created around the IAST hive, says **Jean-Marie Lozachmeur**, director of the Groupe de Recherche en Economie Mathématique et Quantitative: *"The IAST aims to develop an international network of cutting-edge interdisciplinary research, and to encourage the transfer of knowledge to aid decision-making in the public and private sectors. This exciting project fits the brief perfectly, an 'emerging opportunity' to bring new impetus to multidisciplinary collaboration in Toulouse."* ■



MEET THE RESEARCHERS

Frédéric Amblard (UTC) is an associate professor in computer science at Toulouse 1 Capitole and member of the Cooperative Multi-Agent Systems research team.

Adrien Blanchet (IAST) is a mathematician specialized in partial differential equation and optimal transport. Since arriving in Toulouse in 2008, he has focused on applications of mathematics to economics and social sciences.

Paul Seabright (IAST director) has already worked with evolutionary biologists, sociologists, neuroscientists and anthropologists. His book The Company of Strangers has been influential in persuading economists to heed the lessons of modern biology.

Clément Sire (LPT) is an internationally recognized theorist in out-of-equilibrium statistical physics and the former head of the Laboratoire de Physique Théorique.

Guy Theraulaz (CNRS) is a leading thinker in quantitative social ethology and swarm intelligence, with a particular focus on collective behavior in social insects. He is also interested in distributed algorithms such as collective robotics.

TAKING SHAPE

Initial research areas for the MuSE project:

1. Emergence of collective decisions. Clement Sire and Guy Theraulaz aim to extend their research into the crucial moment when fish go from milling to schooling. The project will attempt to model the impact of Darwinian selection on this transition phase.
2. Optimizing individual decisions within a group. What happens when a group is confronted by several choices? The project hopes to identify the best use of public and private information to solve problems, such as guessing which box is the perfect fit for 500 marbles.
3. Collective decisions and information processing by pedestrians. How do we choose where to walk in a crowd? The project will study the way mimetic behaviors, physical interaction, past experience and other information sources affect pedestrians' decisions.
4. Emergence in potential games. Mean-field games offer a promising model in which the strategy of each agent interacts with the distribution of positions and strategies of other players. Applications include the labor and oil markets, portfolio management and academic production.

How do lizards learn from immigrants?

• JEAN CLOBERT •
MAKING SENSE OF META-POPULATIONS

From drifting plankton to airborne spiders, dispersal is essential to most species' survival. How will climate change and man-made threats to fragile ecosystems impact this crucial ability to colonize new habitats? Speaking at IAST's 4th Economics and Biology seminar, Jean Clobert outlined the tentative steps we have begun to take in understanding the intricate dance of dispersal dynamics. Along with brilliant newcomers in the field such as Aïda Nitsch (see page 14), his work sheds light on the complex processes that allow populations, including our own, to adapt and thrive.

As a young postdoctorate flitting between different countries, **Jean Clobert** wondered about the appeal of immigration. *"Humans have colonized the entire world by dispersing. Is it just a best-of-a-bad-job strategy, in which lower-quality individuals are forced to go elsewhere? This resident fitness hypothesis was one of the dominant views about animals when I started at Oxford. I couldn't believe it, especially looking at the success of human immigrants in the US, Australia and New Zealand."*

"There's some sort of imprinting of sociality: lizards born in low-density populations avoid crowded populations later."

Jean Clobert's work challenged prevailing ideas about meta-populations, a central concept in spatial ecology that explains how groups of the same species distribute themselves through the landscape and exchange individuals. In particular, he has demonstrated how dispersal helps meta-populations combat extinction. *"Every time I did an experiment, I discovered something new. Now, by comparing different species, we are developing a general theory for the animal kingdom, and it can probably also be applied to humans."*

As founder and director of the Station d'Ecologie in the foothills of the Pyrenees, **Jean** has built an innovative experimental center that has received extensive coverage in Nature Methods and Science. An integral part of its infrastructure is the metatron, a versatile structure of 48 enclosed patches, each 100m² and connected by S-shaped corridors. *"The metatron is somewhat unique. It allows us to manipulate different components of an ecosystem so we can study the interplay of dispersal, population density, habitat characteristics and environmental influences such as light, humidity and temperature. We are now developing an equivalent set-up for water ecosystems."*

"How were the butterflies able to say, 'I will not leave because something bad is happening elsewhere'?"

Spatial ecology has come a long way since 1965, when **Charles Krebs** erected a fence around a population of voles in Indiana. The voles dramatically increased in number, exhausted their resources then rapidly went extinct. Subsequently, many attempts to explain *'the fence effect'* have shown that higher population density often stimulates dispersal. Many insects such as aphids, for example, produce more winged offspring when density increases.


Jean Clobert, CNRS

ECOLOGY AND ECONOMICS

In his quest to find answers to the biggest challenges facing the natural world, Jean Clobert is excited about the avenues for scientific development opening up in Toulouse. Interactions with IAST members, particularly biology program director Ingela Alger, have already inspired ambitious research projects and a TSE masters program in ecology and economics which will begin in September 2017. *"Certain IAST economists were enthusiastic about our proposal to explore the parallels between human dispersal and local versus global economic exchange,"* Jean Clobert explains. *"There's much more common ground than we thought, in terms of game theory, methods, problems, and so on. We've started a true collaboration, in both teaching and research."*

Dispersers are expected to prefer low competition but, as **Jean** points out, a dense population is also an indicator of good-quality habitat. High densities may also prevent dispersal because of the high cost of social interactions (*'the social fence effect'*), or by reducing body condition. The importance of competition can also vary during dispersal and according to the spatial scale. In red deer, for instance, high densities lead to reduced emigration but longer distances.

For 27 years, **Jean Clobert**'s own research has focused on the finger-sized common lizard (*Zootoca vivipara*), which has easily monitored dispersal distances. His experiments on these movements have shown that population density and kin competition are part of a tightly knotted bundle of interdependent causes. Among these, one of the most intriguing elements in this still-unfolding story is the role of social information.

Studies of an endangered butterfly (*Proclossiana eunomia*) by **Michel Baguette**, who is also affiliated to the Station d'Ecologie, found that when individuals left damaged wetland habitat, their arrival did not increase dispersal rates in neighboring populations. *"It is difficult to understand that result,"* says **Jean**, *"without thinking that those butterflies have some knowledge of what is going on at the meta-population level. How were butterflies in the recipient population able to say, 'I will not leave because my habitat is good and something bad is happening elsewhere'?"*

Like Baguette's butterflies, the dispersal responses of the metatron lizards were dependent on information provided by immigrants. To **Jean Clobert**'s particular delight, population density had a positive effect on the lizards' dispersal only when groups were connected with others. And if immigrants arrived from low-density populations, this *"information"* sparked higher dispersal rates.

Jean demonstrated startling parallels in ciliate protozoans, which are extremely simple organisms. *"We don't yet know exactly how the mechanisms work,"* he admits, *"but it was quite amazing to find, in a very different species, that immigrants carry information that affects dispersal decisions in the recipient population."*

Lizards have different levels of *"social skill"*, says **Jean**, and sociality is just one of the many ways individuals can transmit information. His evidence shows a wide range of individual characteristics, including size, physiology and personality, can impact dispersal decisions.

"There is a triple interaction between the individual phenotype, the density of the recipient population and the density of the original population. For instance, there's clearly some sort of imprinting of sociality: those born in low-density populations seem to avoid crowded populations later on. Some comparison could be done with people born in towns or villages. So the information that immigrants carry can be quite compound and is translated into different decisions by individuals of the same population."

Undaunted, **Jean** wants meta-population theory to account for the interaction of individual variation and the environment. He aims to build a comprehensive array of lab research to describe individual phenotypes, from genes to behavior, and to measure their impact on ecosystems. The scale of the task is immense, but the implications for our understanding of evolution and society may be even greater. ■

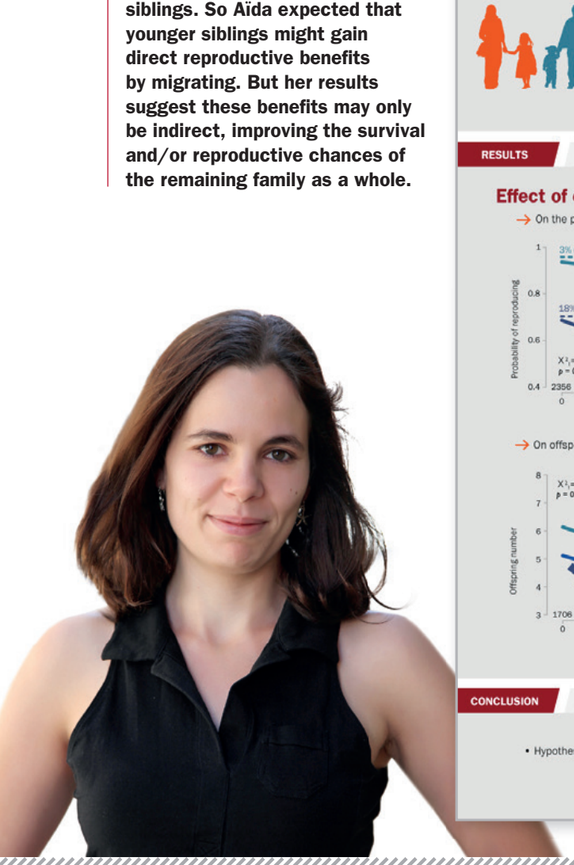
FIND OUT MORE

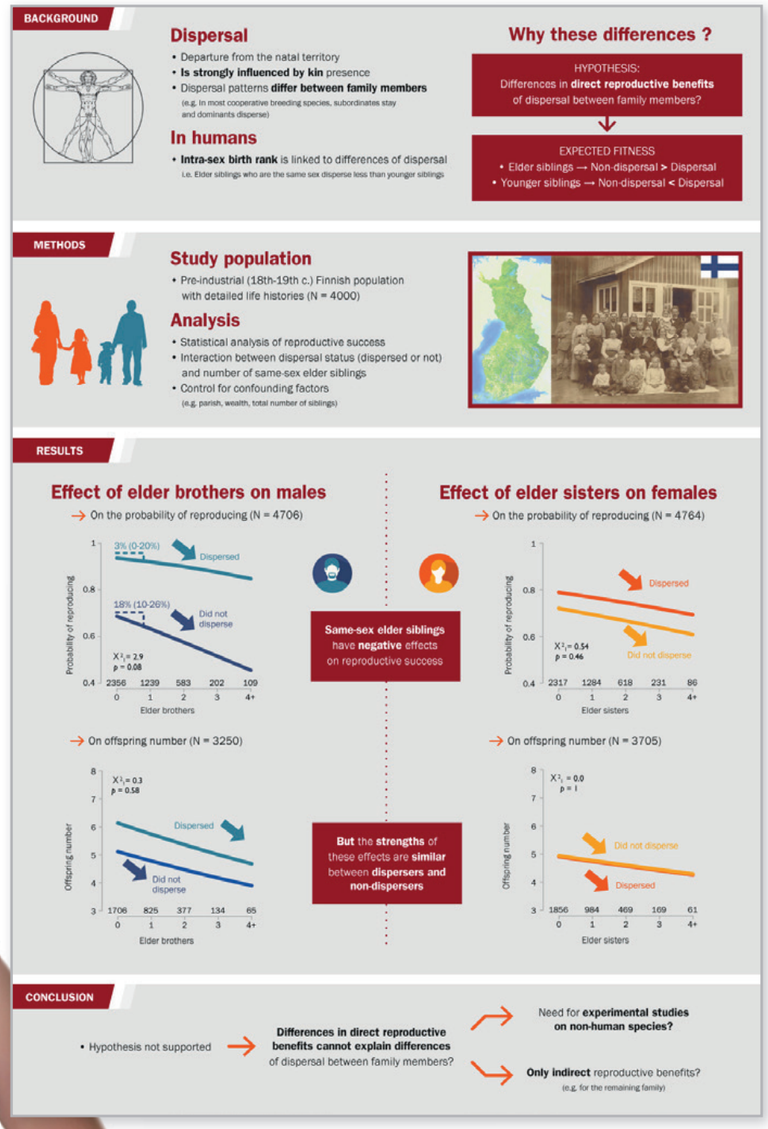
- For a comprehensive review of the field, read **'Dispersal Ecology and Evolution'** (2012), edited by Jean Clobert and other leading researchers.
- See also Jean Clobert's article on **'Informed dispersal'** in Ecology Letters (2009).

Dispersal strategy in humans

• AÏDA NITSCH •
SHOULD I STAY OR SHOULD MY SIBLINGS GO?

Aïda Nitsch presents findings from the first study to investigate simultaneously the influence of siblings and migration on reproductive success. Using church records from preindustrial Finland, she found that elder siblings improved an individual's chances of reaching sexual maturity. Reproductive success, however, was reduced by the presence of same-sex elder siblings. So Aïda expected that younger siblings might gain direct reproductive benefits by migrating. But her results suggest these benefits may only be indirect, improving the survival and/or reproductive chances of the remaining family as a whole.





Sex, selection and teamwork

• ARNAUD TOGNETTI •
ARE MALE HELPERS SHOWING OFF?

Cooperation in humans and other social species can be costly in terms of Darwinian fitness. For defense against predators, it can be extremely dangerous. So what explains this behavior? In a new research project, IAST biologist Arnaud Tognetti aims to study the importance of cooperation for mating success and to test whether helping is heritable.

The indirect fitness benefits of helping relatives are well established: kin cooperation can enhance the likelihood that a helper's genetic traits will be passed on. But the importance of direct benefits, especially social and reproductive ones, has also begun to receive more attention.

"Several observations suggest that cooperative males are sexually preferred."

In humans, there is increasing evidence that cooperation might be sexually selected. Tognetti's own work suggests that men signal their cooperativeness in the context of mate choice: in the presence of women, men are more cooperative and compete to be the most cooperative in a group. In other research, they are perceived as more attractive and report more sexual partners.

However, most studies of cooperation have considered relatively short-term consequences. **Arnaud** wants to extend this research to non-human species and investigate more robust fitness indicators such as reproductive success. *"Several observations suggest that cooperative males are sexually preferred,"* he says. *"In some birds, such as pied kingfishers or bell miners, some males act as helpers and provide care for offspring that are not their own, resulting in enhanced mating success."*

Arnaud is closely involved with a long-term project studying sociable weaver birds in South Africa. In this species, up to five males assist breeding pairs in feeding their nestlings. This behavior is likely to provide indirect fitness benefits as groups are usually formed by kin. *"But contrary to kin selection expectations, the feeding rate of helpers is negatively associated to their relatedness to the nestlings. This suggests additional direct benefits are possible such as increased reproductive success."*


Sociable weaver birds have a clever cooperating strategy

Weavers live in a communal colony structure. During the breeding season, breeders and helpers frequently visit the colony to feed the nestlings or to roost. *"These visits allow individuals to observe each other,"* says **Arnaud**, *"creating potential conditions for individual reputations to be established and for this information to be used by others."*

As well as measuring the feeding rates of helpers, Tognetti's team hope to identify which helpers become breeders. *"This data will determine whether the probability of mating is related to the helpers' investment in feeding."*

The observation that males are more cooperative when females are present has yet to be determined in non-human species. To test for this behavior among sociable weavers, **Arnaud** has been using recordings of bird calls to simulate the presence of females in the colony, and measuring the effect on helpers' feeding rates.

Arnaud will also examine the genetic basis of cooperative behavior in the social weaver. *"If helping is heritable, a cooperative mate could yield more cooperative offspring and thus increase the offspring's attractiveness,"* he says. *"In humans, a number of candidate genes (MAOA and DRD4) have been recently identified with altruism – but this possibility remains poorly explored in other social species."* ■

FIND OUT MORE

- See Arnaud's paper, **'Are cooperative men showing off?'**

Ethics ex machina

• JEAN-FRANÇOIS BONNEFON •
WHOSE LIFE SHOULD YOUR CAR SAVE?

The safer, cleaner and more efficient future promised by driverless vehicles appears tantalizingly close. In August, the French government allowed experimental use on the roads; in November, members of the public tested driverless minibuses in central Toulouse. But as important research by IAST psychologist Jean-François Bonnefon and his MIT colleagues has shown, there are thorny ethical dilemmas to be faced before driverless vehicles get a green light.

"Imagine a situation in which a driverless car is about to plow into a crowd of 10 people, but it could save them by veering into a wall, killing its own passengers," **Jean-François Bonnefon** suggests. *"The US participants in our studies said that, from a moral perspective, the car must save the greater number of lives. But when buying a car, they would prefer one that prioritizes the lives of its passengers."*

"Machines can make quick decisions that could drastically reduce traffic fatalities. But what values are we going to embed in the cars?" – Barack Obama

Recently published in the journal *Science*, Bonnefon's research has received extensive media coverage around the world, and more than two million people have participated online by judging crash dilemmas on MIT's Moral Machine (*see moralmachine.mit.edu*). Even the US president has joined the debate.

"We have machines that can make a bunch of quick decisions that could drastically reduce traffic fatalities, drastically improve the efficiency of our transportation grid, and help solve things like carbon emissions that are causing the warming of the planet," **Barack Obama** told *Wired* magazine in October. *"But what are the values that we're going to embed in the cars? There are gonna be a bunch of choices that you have to make, and who's setting up those rules?"*

Google self-driving car

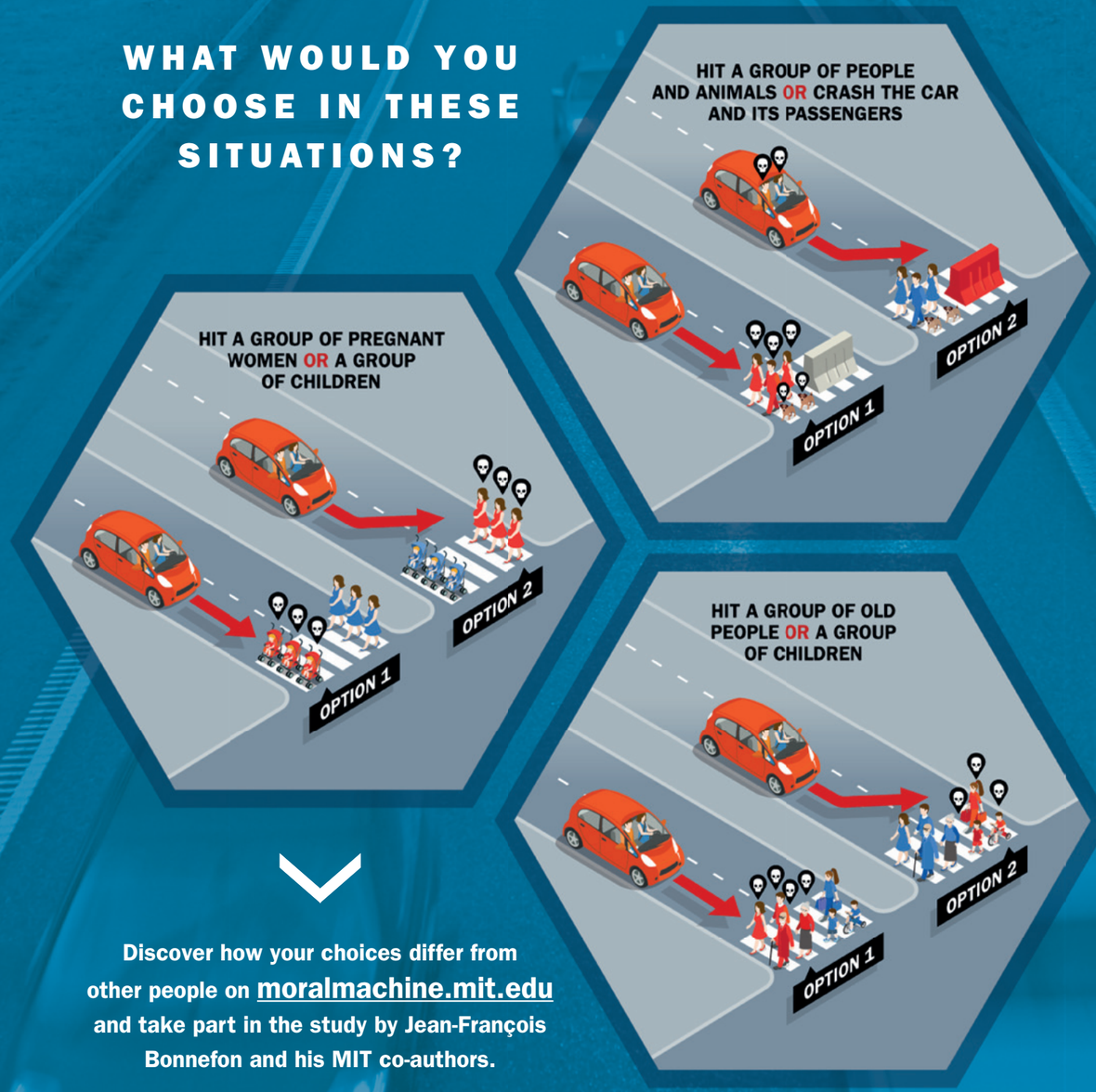
Jean-François fears the human brain may not be prepared to deal with such complexities but hopes his work will help people make better decisions. In a recent op-ed for *The New York Times*, he and his co-researchers praised Mercedes-Benz, despite its mixed messages, for speaking out on the subject. Widespread use of driverless cars will only happen, they argue, when people are comfortable with carmakers' solutions to ethical dilemmas.

"From a moral perspective, the car must save the greater number of lives. But when buying a car, they would prefer one that prioritizes the lives of its passengers."

"The sooner driverless cars are adopted, the more lives will be saved. But taking seriously the psychological as well as technological challenges of autonomous vehicles will be necessary in freeing us from the tedious, wasteful and dangerous system of driving that we have put up with for more than a century." ■

TEST YOUR MORALS:

WHAT WOULD YOU CHOOSE IN THESE SITUATIONS?



Discover how your choices differ from other people on moralmachine.mit.edu and take part in the study by Jean-François Bonnefon and his MIT co-authors.

Putting politics on the map

• ANDREW GELMAN & SIMON HIX •
TRANSATLANTIC TRENDS

The IAST Political Economy and Political Science conference aims to promote interdisciplinary research and methodological integration in the social sciences. Among the heavy hitters at this year's event, titled 'Mapping Political Preferences', were Columbia's Andrew Gelman, an acclaimed US statistician and scourge of bad science, and LSE's Simon Hix, whose expertise on British and European politics is in demand across the continent. They talked to IAST Connect about recent trends in the field, including the rise of Donald Trump and the fragility of the EU project.

Why don't journalists seek out political scientists as often as they interview natural scientists or economists, or treat them with the same deference? Is public perception changing?

AG: Yes, it's changing. There's now more awareness that US presidential elections are highly predictable based on the economy and presidential popularity, and off-year elections are predictable in part based on the desire of people to balance the government. Some ideas and concepts are fairly straightforward so maybe political scientists don't seem to offer technical expertise. But **Adam Bonica** [Stanford University] was here presenting his work on campaign contributions and aligning legislatures, and journalists do use that sort of thing.

Science and economics reporters often seem to have heroes that they like to promote. Political science doesn't seem to be so personality driven, and that's probably a good thing. **Bob Putnam** became well known with Bowling Alone but people didn't think of him as a Jesus figure like **Paul Krugman**. In the 70s and 80s, economists and business leaders had less prestige. There was no equivalent to Bill Gates or Steve Jobs. We're in a new Gilded Age.

> "The polls were reasonably accurate in indicating that people were willing to vote for Trump. It's just that it was hard to believe people really would."

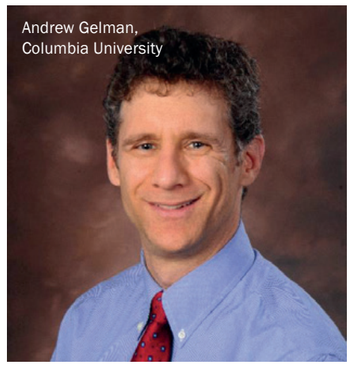
SH: In the US, the high-end media outlets have latched on to political science in the same way that about a decade ago they latched on to economics – *the New York Times* has got a whole political science team that does *'FiveThirtyEight'*, the *Washington Post* has bought 'The Monkey Cage'. We're slightly behind in Europe, but there's more and more data journalism. *The Guardian* has a data blog, and it's mostly economists and political scientists. The BBC now has a data editor.

> "Now economics is a much more pluralist, more porous discipline – they've realized that they don't have all the answers."

In the UK, and it's starting to happen elsewhere in Europe, researchers now have to demonstrate impact on the public debate. The paper I presented at IAST is looking at the debate about Brexit, right in the midst of a campaign. And this kind of thing gets reported in the press. You're interviewing me on the day that I was quoted in The Economist and The Times.

Is there enough science in political science? Do you see the right balance between quantitative and qualitative research?

AG: It's important to have a bridge, a connection between what comes out from the survey and individual survey responses. Quantitative work should make sense at an intuitive level. The statistical model of science is that you have some idea, you conduct an experiment, and if the result is statistically significant, you publish. That model seemed to be going OK for a while but now it's broken. Too many researchers use procedures which allow you to find statistical significance if you look at enough things in the data.



Andrew Gelman, Columbia University

Simon Hix, London School of Economics

SH: We used to talk about politics, not political science – people who studied politics knew about political ideologies, political theory, Marx, Locke and Hobbes, and they'd be pundits on the news. It's early days, but there's growing recognition of political scientists as scientists with a capital 'S', meaning they don't just tell us anecdotes, but about regularities from data.

> "There's growing recognition of political scientists as scientists with a capital 'S', meaning they don't just tell us anecdotes, but about regularities from data."

A lot of political scientists these days think of politics as a multi-dimensional space, a continuum with a political or economic left and right. We want to measure where voters and other actors are located in that space and understand how they move according to income, education, beliefs and so on.

> "The issue of a lack of legitimacy of the European Union is not going to go away, especially after the Brexit referendum."

What can be done to maintain public confidence in social science? What is the role of public intellectuals?

AG: We have to accept uncertainty. You have to have a realistic understanding of what you can get from a finite sample. A lot of work is based on small samples and effects that are hard to detect. That model won't work if every time you drill you're required to declare that you've found oil. You have to be able to accept the possibility of failure and the incentives aren't set up to do that.

SH: The social sciences went through about 30-40 years of being very insular. Economics was hit heavily by the failure to predict the 2008 crisis. Meanwhile, behavioral economists have said, *'Let's take psychology, sociology, some context from the lawyers and political scientists, and mix that in.'* Now economics is a much more pluralist, more porous discipline – they've realized that they don't have all the answers.

In the UK, the Economic and Social Research Council has appointed senior academics, not to do new research, but to be engaged in the public debate. We've committed to not take public positions on either side of the Brexit debate, but rather to correct misconceptions or misclaims, to bring facts and context.

Why were so many commentators taken by surprise by the rise of Donald Trump? What explains the recent success of populist politicians in the US and Europe?

AG: Trump seemed to be an outsider and people had implicit models that Republicans wouldn't vote for someone who was so unusual. I was surprised too, but US primary elections are very hard to predict: there are multiple candidates; the candidates tend to have very similar policies and ideologies; they have the same political party, so you don't have all the usual information to distinguish candidates; voters don't have a lot of time to make their decision; and turnout is highly variable. The polls for Trump were reasonably accurate in indicating that people were willing to vote for him. It's just that it was hard to believe people really would.*

SH: In a lot of European countries, and this is slightly different to the US, there is a growing geographic gap. There are the globalizing cities that generate growth in finance, represented by mainstream center right, and creative industries, represented by the mainstream center left. Then there are cities in industrial decline, which still have socialists as number one and now these populists as number two; and ageing rural populations, which have conservatives as number one and populists as number two.

The issue of a lack of legitimacy of the European Union is not going to go away, especially after the Brexit referendum. The whole project is based on output legitimacy, which is economic performance, and the EU is failing to deliver that. Even in periods of economic growth, we've seen a secular decline in support for the EU as people question its political accountability and direction, immigration controls and so on.

What are your impressions of your visit to IAST?

AG: It's been very lively and interesting. I've learned a lot from the presentations and discussions. It's a very good mix of people, ...

"This IAST conference has become a fixture on the map."

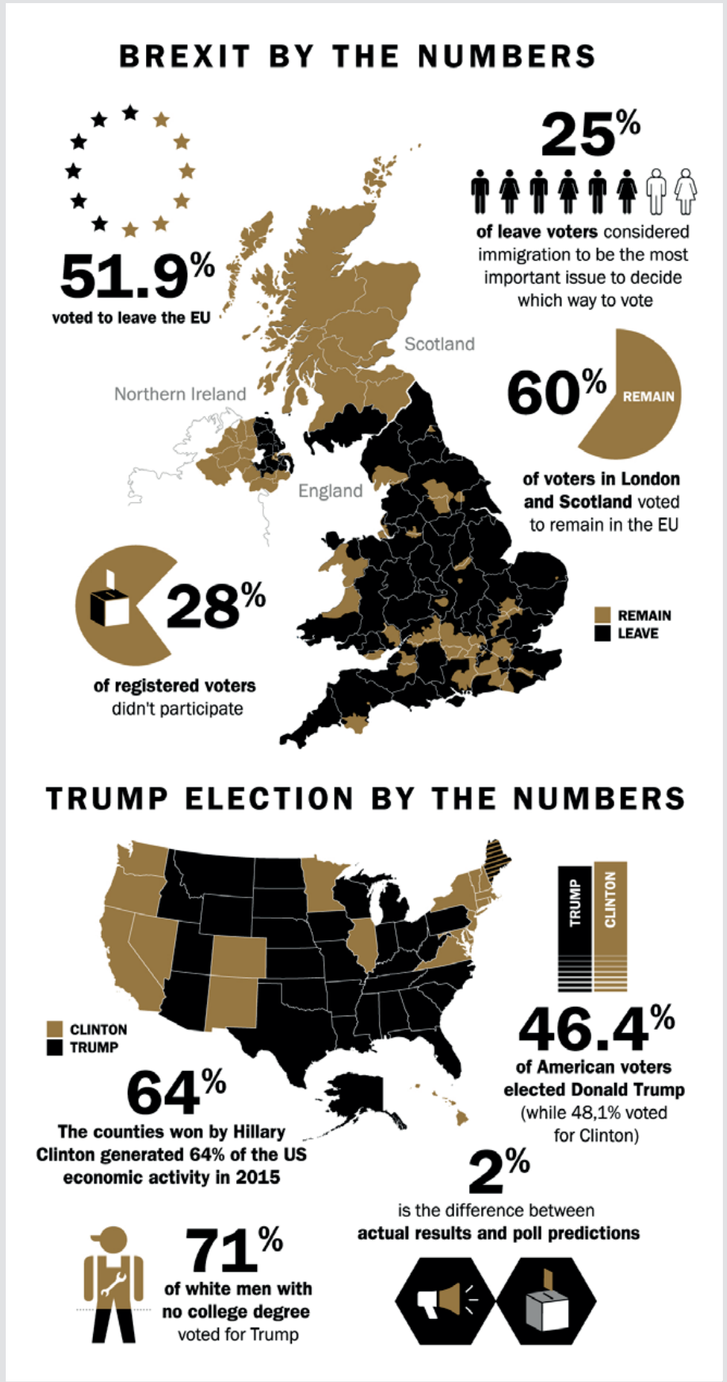
it's always good to have young people because they're working hard for ideas. I like the food here, but after we went to the Toulouse-Lautrec museum in Albi and the ramparts of Carcassonne, my kids said they'd had enough of medieval cities.

SH: This IAST conference has become a fixture on the map. It brings together top political scientists, political economists and methodologists and this is the sort of network we need in Europe. It's hugely useful to generate insights about where the field is moving and cutting-edge methodological issues. When you get an invite to Toulouse, you go, *'Yes, thanks, great!'*

FIND OUT MORE

Andrew Gelman is Professor of Political Science and Statistics at Columbia University. He is known for incisive commentary on *'The Monkey Cage'* blog on *the Washington Post*, as well as his own blog www.andrewgelman.com. He is the author of a number of books including *Red State, Blue State, Rich State*, Poor State, which shattered popular myths about the way Americans vote.

Simon Hix is Professor of European and Comparative Politics at the London School of Economics and Political Science, and the author of several books, including *What's Wrong with the European Union and How to Fix It*. For a video of his insightful response to the Brexit referendum, see: https://youtu.be/3p9hxtGltlU



The legacy of slavery

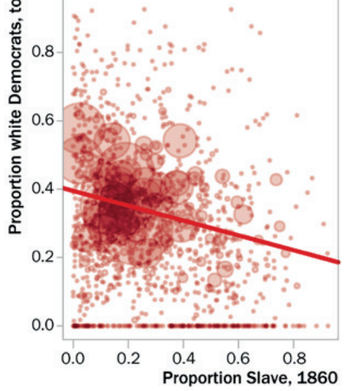
• MATTHEW BLACKWELL & MAYA SEN • SHADOWS OF THE PAST

The inauguration of President Barack Obama in 2009 raised hopes of a new post-racial America. But this dream remains out of reach as recent high-profile police shootings have stoked racial tensions. Speaking at IAST's Political Economy and Political Science conference, Harvard scholars Matthew Blackwell and Maya Sen showed that political attitudes today are still branded by the cruelties of slavery more than 150 years ago.


Matthew Blackwell


Maya Sen

"In our study, we found that whites who currently live in areas of the American South that had high shares of slaves in 1860 are more likely to identify as a Republican, oppose affirmative action, and express racial resentment and colder feelings toward blacks," said **Matthew Blackwell**. *"Our results are not predicted by existing theories, such as contemporary racial threat."*



For an explanation, these political scientists and their co-author, **Avidit Acharya**, turned to a growing literature in development economics on long-term institutional effects. They argue that to maintain control over the newly free African-American population, Southern whites faced incentives to reinforce existing racist norms and institutions. This amplified local differences in racially conservative attitudes, which have been passed down locally across generations.

"Slavery can seem a really long time ago to many Americans," said **Maya Sen**, *"but it's just the lifetimes of two 75-year-olds put together. A lot of early 20th-century institutions continued the suppression of African-Americans living in the South. Blacks were prevented from voting and suffered very restrictive poll taxes, property laws and anti-vagrancy laws. This 'Jim Crow' system wasn't really dismantled until the 1960s."*

"Southern whites strengthened their anti-black attitudes to justify their actions. And these ideas persist today."

"The whites involved in these institutions strengthened their anti-black attitudes to justify their actions," continued **Matthew Blackwell**. *"And these attitudes – that blacks are too lazy to work, or that we have to lynch blacks because they're violent – do not go away with a few Civil Rights laws in the 1960s. These ideas persist today."*

The researchers hope to continue examining long-term institutional effects on contemporary politics, and felt energised by their interactions with IAST members. *"The reputation of IAST precedes everything, we've been very impressed,"* said **Maya**. *"**Pauline Grosjean** has sent us her work on the persistence of violence in the South. And **Charlotte Cavaillé** made an excellent point about the role of less affluent classes in Southern white communities."*

"It's been great to have people talk to us from the perspective of their different disciplines," added **Matthew**. *"Someone who studies cognitive psychology and behavioral genetics suggested that racist attitudes could be hereditary. And **Jonathan Klingler** was pushing us to think more carefully about mechanisms. The range of feedback seems indicative of IAST's broad set of approaches and shared values. It was a lively room and fun to engage with, and this is a place that really encourages that."*

PERSISTENCE EFFECTS

Nathan Nunn and **Leonard Wantchekon** have shown that Africans whose ancestors were heavily raided during the slave trade are less trusting today. See **"The Slave Trade and the Origins of Mistrust in Africa"**.

Melissa Dell has found that areas of Peru and Bolivia that used forced mining labor in colonial times are less developed today and have shorter children. See **"The Persistent Effects of Peru's Mining Mita"**.

Nico Voigtlaender and **Hans-Joachim Voth** have linked anti-Semitic pogroms in medieval Germany to votes for the Nazis in the 1930s. See **"Persecution Perpetuated: The Medieval Origins of Anti-Semitic Violence in Nazi Germany"**.

Casting the net wide

• CÉSAR MANTILLA •
HOW TO REWARD SUSTAINABLE FISHING

After three vibrant years at IAST, César Mantilla returns this year to his native Colombia brimming with optimism, fresh perspectives and original research ideas. In a new position as assistant professor in economics at Universidad de Rosario in Bogota, he wants to spread IAST's interdisciplinary approach and bend the ears of policymakers on behalf of isolated fishing communities.

While in Toulouse, **César Mantilla** was able to pool his expertise in experimental methodology in the service of very different projects, reaching beyond his core interests in development and environmental economics. *"IAST has been an open door for me to do so many different things. I will really miss the opportunity to attend so many diverse seminars. In Rosario I will teach an introductory econometrics course and will advocate sharing this course with political scientists and epidemiologists. I also want to teach transversal courses in risk literacy, because this is relevant to all social sciences."*

In 2011, **César** began to work among fishing communities on Colombia's coasts, honing his methodological skills and fueling his fascination with social networks and cooperation dilemmas. In Toulouse, he teamed up with IAST psychology program director **Astrid Hopfensitz** and TSE development economist **Josepa (Pepita) Miquel-Florensa** to test ways of rewarding sustainable fishing.

Introducing fishermen to games with paper boats and rolling dice to simulate fishing yield, they studied the impact of price incentives on two communities on Baru Island, near Cartagena. The southern fishermen enforce technological restrictions on fishing to protect stocks; their northern neighbors use nets and have better access to markets.

"When we said, 'If you catch less, we will pay you more per unit,' it only worked in the group that was outside the marine protected area," says **César**. *"Our explanation is that the southern group have intrinsic preferences for preserving their resources because they depend on them. They have learned not to overextract and this social norm may be stronger than our monetary incentive."*

"If I could could bring something back to Colombia it would be French food and social awareness."

In these remote fishing villages, says **César**, information technologies can have positive effects. *"From the supply side, fishermen can communicate and bargain on prices with multiple intermediaries before landing, reducing waste. From the demand side, final consumers can now access market platforms such as buying clubs. Willingness to pay is higher, not only because the product is fresher, but also due to reduced social distance between the producer and the consumer. So there's some kind of 'warm glow' effect."*

THE DOMINO EFFECT

Some discoveries on Baru have come at cost to César's wallet. "The fishermen love playing dominoes, smashing them down on the table for luck. I lost all the time and had to pay for the drinks. They're extremely good at Bayesian updating – they know the distribution of dominoes on the table and in your hands. They are mostly illiterate but their numeracy skills are very high. I'd like to do an experiment to see if these skills could be extrapolated to other domains."

Stock-protection study on Baru island, Colombia

The Baru speciality is a fried cornbread arepa filled with egg and sea snails, which **César** insists is *"delicious"*. But that's not the only reason he hopes to continue his work in these communities. He wants to raise awareness of the difficulties they face, from overfishing to market access. *"I would be very happy if I was listened to in broader circles, to speak about the problems I have seen. Academics are respected in Colombia. It's not always for the right reasons, but if you ask the relevant questions and tackle them properly, you can be heard by those that are making the final decisions."*

Many of **César**'s questions have been inspired by his IAST experience. "I had a lot of interesting conversations with evolutionary anthropologists such as **Jonathan Stieglitz**, often about his experiences working in Bolivia; and **Heidi Colleran**, who is also interested in the 'tragedy of the commons'. It's been extremely useful to find out what they are doing and think about other types of questions.

"I've also become much more interested in political science. I've started to see that the division with development economics is very blurry: a lot of development economics research is focused on which policies work, but the first stage of this game is always political. And **Astrid Hopfensitz** *has influenced me to think about experiments from a more psychological perspective. With (IAST director)* **Paul Seabright***, I recently ran a field experiment in south China, using games to determine levels of trust between ethnicities."*

It's not just the IAST environment that **César** will miss. *"Colombian soups are great and I made my own arepas here, but if I could bring something back to Colombia it would be French food and social awareness."* At the same time, he's looking forward to returning to his family, teaching in Bogota, and the rough life and warm smiles of the fishing village. ■

FIND OUT MORE

See César's working papers on his website.

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Pyrenean Interdisciplinary Research Event (PIREN)

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SEMINAR
Alex Kacelnik
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