



Camillo De Lellis Appointed to Faculty

Using modern tools and innovative approaches to examine fundamental questions



Camillo De Lellis

Camillo De Lellis, a world-renowned geometric analyst with broad expertise in the calculus of variations, geometric regularity theory, and fluid dynamics, has been appointed to the Faculty of the School of Mathematics, effective July 1, 2018. De Lellis, currently Professor at Universität Zürich, succeeds Professor Emeritus Thomas Spencer, who has served on the Faculty since 1986.

An original and prolific mathematician, De Lellis has contributed profoundly to central problems of analysis and geometry. His use of modern tools and innovative

approaches in examining fundamental questions in the field have resulted in new and monumental insights that have advanced understanding within the mathematical community.

“Camillo is one of today’s leading analysts,” said Helmut Hofer, Professor in the School of Mathematics. “His contributions to major subjects in the field are among the most important achievements in recent times. His scientific leadership, innovative vision, great originality, technical strength, and exceptional

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Francesca Trivellato Appointed to Faculty

Revitalizing the study of economic, social, and cultural history of the early modern period

Francesca Trivellato, one of the foremost historians of economic, social, and cultural history of the early modern period, has been appointed to the Faculty of the School of Historical Studies, effective July 1, 2018. Trivellato, who is a former Hans Kohn Member in the School, is currently the Barton M. Biggs Professor of History at Yale University. She succeeds Professor Emeritus Jonathan Israel, who has served on the Faculty since 2001.

A leading historian of early modern Italy and continental Europe, Trivellato has made significant and groundbreaking contributions to our understanding of the organization and culture of the marketplace in the pre-industrial world. Trivellato’s original and imaginative research has revitalized the study of early economic history, and her influential work on cross-cultural trade intersects the fields of European, Jewish, Mediterranean, and global history, religion, and capitalism.

“We are extremely pleased that Professor Trivellato will be joining the School of Historical Studies,” said Patrick Geary, Andrew W. Mellon Professor in the

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Francesca Trivellato

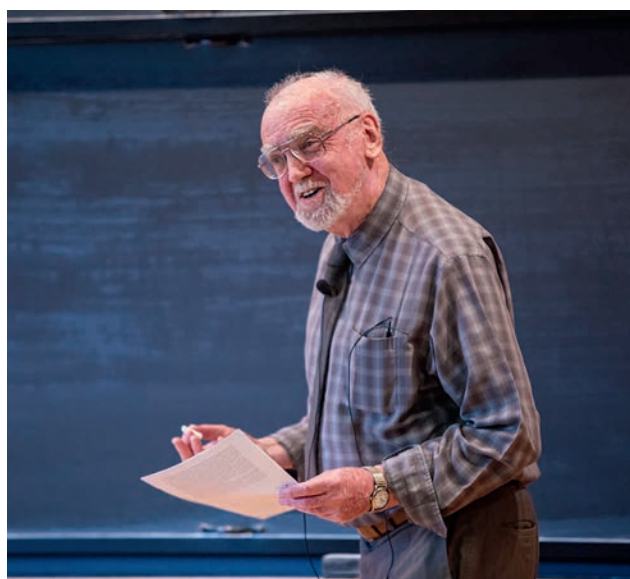
Robert P. Langlands Awarded 2018 Abel Prize

Far-reaching insights and a visionary program connecting representation theory to number theory

The Norwegian Academy of Science and Letters has awarded the 2018 Abel Prize to Robert P. Langlands, Professor Emeritus in the School of Mathematics. Langlands was cited by the Abel Committee “for his visionary program connecting representation theory to number theory.”

A set of overarching and interconnected conjectures collectively known as the Langlands program has had a deep influence across a broad sweep of mathematics and parts of theoretical physics. The origins of the program are found in a seventeen-page handwritten letter that Langlands wrote in 1967 to André Weil, a Professor at the Institute at the time, in which he proposed a grand unifying theory that relates seemingly unrelated concepts in number theory, algebraic geometry, and the theory of automorphic forms. A typed copy of the letter, made at Weil’s request for easier reading, circulated widely among mathematicians in the late 1960s and 1970s, and for more than four decades, mathematicians have been working on its conjectures.

“The Institute is incredibly proud and pleased that



Robert Langlands, Professor Emeritus in the School of Mathematics, at a “Beyond Endoscopy” conference held at the Institute in fall 2016, which centered on various aspects of functoriality beyond endoscopy

Robert Langlands has received the great honor of the 2018 Abel Prize in recognition of his visionary program,” said Robbert Dijkgraaf, Director and Leon Levy Professor. “Bob’s deep insights have inspired generations of mathematicians and yielded many profound breakthroughs. The course he charted will guide the future of mathematics and will undoubtedly lead to new surprising discoveries—a gift to the world, that keeps on giving.”

Peter Sarnak, Professor in the Institute’s School of Mathematics, added, “The Langlands program and its core conjecture (functoriality) were born out of concrete and far-reaching breakthroughs that Langlands achieved early on. Once he recognized these unifying themes, Langlands (and his students and his “school”) spent much of his time and effort developing fundamental tools (such as the trace formula) in order to establish many cases of his conjectures. These cases are all hard earned and have often proven to be the basis for spectacular works by others (a well-known example is Langlands’s base

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News of the Institute Community

Nanjing University has honored YVE-ALAIN BOIS, Professor in the School of Historical Studies, with the distinguished title of Chun-tu Hsueh Chair Professor.

The American Mathematical Society has awarded the 2018 Steele Prize for Lifetime Achievement to JEAN BOURGAIN, IBM von Neumann Professor in the School of Mathematics.

ANGELOS CHANIOTIS, Professor in the School of Historical Studies, has been awarded the degree of doctor honoris causa from the Aristotle University of Thessaloniki. Chaniotis has also authored *Age of Conquests: The Greek World from Alexander to Hadrian* (Harvard University Press, 2018). In addition, “A World of Emotions: Ancient Greece, 700 B.C.–200 A.D.,” an exhibition co-curated by Chaniotis at the Onassis Cultural Center New York, has won the Global Fine Art Awards’s 2017 Youniversal Award.

ROBERT MACPHERSON, Hermann Weyl Professor in the School of Mathematics, has received an honorary doctorate of science from the University of Chicago.

JUAN MALDACENA, Carl P. Feinberg Professor in the School of Natural Sciences, has been awarded the Lorentz Medal from the Royal Netherlands Academy of Arts and Sciences.

PETER SARNAK, Professor in the School of Mathematics, has received an honorary doctorate from King’s College London.

SABINE SCHMIDTKE, Professor in the School of Historical Studies, and HASSAN ANSARI, Member in the School, have coauthored *Studies in Medieval Islamic Intellectual Traditions* (Lockwood Press, 2017).

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Questions and comments regarding the *Institute Letter* should be directed to Kelly Devine Thomas, Editorial Director, via email at kdthomas@ias.edu or by telephone at (609) 734-8091.

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Articles from issues of the *Institute Letter* are available online at www.ias.edu/ideas.

To receive monthly updates on Institute events, videos, and other news by email, subscribe to IAS eNews at www.ias.edu/enews.

The American Numismatic Society has elected GLEN W. BOWERSOCK, Professor Emeritus in the School of Historical Studies, as an Honorary Life Fellow.

Liveright has published *Maker of Patterns: An Autobiography Through Letters* (2018) by FREEMAN DYSON, Professor Emeritus in the School of Natural Sciences.

JOAN WALLACH SCOTT, Professor Emerita in the School of Social Science, has been named a Chevalier de la Légion d’Honneur of France and has been awarded an honorary doctorate by the University of Edinburgh. Additionally, Scott has coauthored *Les Défis de la République: Genre, Territoires, Citoyenneté* (Les presses de Sciences Po, 2017), and Columbia University Press has reissued Scott’s *Gender and the Politics of History (Gender and Culture) Anniversary Edition* (2018).

MICHAEL WALZER, Professor Emeritus in the School of Social Science, has authored *A Foreign Policy for the Left* (Yale University Press, 2018), which was adapted from essays published in *Dissent*.

LORRAINE DASTON, Institute Trustee and Director of the Max Plank Institute for the History of Science, has been awarded the international Dan David Prize.

JESSICA FINTZEN, Member in the School of Mathematics, has been awarded the 2018 Friedrich Hirzebruch Doctoral Award from the German Academic Scholarship Foundation for her dissertation on the interplay between number theory and representation theory.

JEAN-BAPTISTE FOUVRY, Space Telescope Science Institute Hubble Fellow in the School of Natural Sciences, has been recognized for his dissertation with several distinctions, including the Chancellerie des Universités de Paris’s Aguirre-Basualdo Prize, the Société Française d’Astronomie et d’Astrophysique’s 2017 Thesis Prize, an honorable mention for the Société Française de Physique’s 2016 Daniel Guinier Prize, and publication in Springer’s *Recognizing Outstanding Ph.D. Research* series.

ALEKSANDR LOGUNOV, Schmidt Fellow in the School of Mathematics, and SCOTT SHEFFIELD, Member (2006–07) in the School, have received Clay Research Awards.

ASSAF NAOR, Member in the School of Mathematics, has received the 2018 Frederic Esser Nemmers Mathematics Prize from Northwestern University.

The Alfred P. Sloan Foundation has awarded 2018 Sloan Research Fellowships to LILLIAN PIERCE, von Neumann Fellow in the School of Mathematics, and former Members YAIZA CANZANI (2014–15), TYE LIDMAN (2015–16), SHUBHANGI SARAF (2010–11, 2011–12), ARUL SHANKAR (2012–13), and DAVID SIMMONS-DUFFIN (2012–17).

The Breakthrough Prize Foundation has awarded 2018 New Horizons in Physics Prizes to DOUGLAS STANFORD, Member in the School of Natural Sciences, and CHRISTOPHER HIRATA, Member (2005–07) in the School. Additionally, DAVID SPERGEL, Visitor (2014) and Member (1985–88), has received the 2018 Breakthrough Prize in Fundamental Physics. ZHIWEI YUN, Member (2009–10) in the School of Mathematics, has received the 2018 New Horizons in Mathematics Prize.

SHATEMA THREADCRAFT, Ralph E. and Doris M. Hansmann Member in the School of Social Science, has received many prizes for her book *Intimate Justice: The Black Female Body and the Body Politic* (Oxford University Press, 2016), including the American Political Science Association’s 2017 Race and Political Theory Best Book Award; the National Women’s Studies Association’s 2017 Sarah A. Whaley Book Prize; and the National Conference of Black Political Scientists’s 2017 W. E. B. Du Bois Distinguished Book Award.

YUAN-SEN TING, Martin A. and Helen Chooljian Member in the School of Natural Sciences, has been selected by NASA for its Hubble Fellowship Program.

AKSHAY VENKATESH, Distinguished Visiting Professor and Infosys Member in the School of Mathematics, has been awarded the 2017 Ostrowski Prize.

AGATA ZYSIAK, Member in the School of Social Science, has been awarded the 2017 Kazimierz Moczarski Award as well as the 2017 Bronisław Geremek Prize for her book *Punkty za pochodzenie. Powojenna modernizacja i uniwersytet w robotniczym mieście* (*Affirmative Action: Postwar Modernization and University in the Working-Class City*) (Nomos, 2016).

The American Astronomical Society has awarded the Helen B. Warner Prize to YACINE ALI-HAÏMOUD (2011–14), the Chambliss Astronomical Writing Award to KEVIN HENG (2007–10), and the Henry Norris Russell Lectureship to JOSEPH SILK (1975–76), Members in the School of Natural Sciences.

NORMAN BIRNBAUM, Member (1975–76) in the School of Social Science, has been awarded the Grand Cross of the Order of Merit of the Federal Republic of Germany.

CHAIM GANS, Member (2015–16) in the School of Social Science, has been honored with the Jordan Schnitzer Book Award in Philosophy and Jewish Thought from the Association for Jewish Studies for *A Political Theory for the Jewish People* (Oxford University Press, 2016).

HUGH GUSTERSON, Member (2014–15) in the School of Social Science, has received the 2017 Roy C. Palmer Civil Liberties Prize for *Drone: Remote Control Warfare* (MIT Press, 2016), which he wrote during his time at the Institute.

YITZHAK HEN, Member (2012–13) in the School of Historical Studies, has been appointed as Director of Hebrew University’s Israel Institute for Advanced Studies.

ALEXANDER LUBOTZKY, Member (2005–06) in the School of Mathematics, has been awarded the 2018 Israel Prize by the Israeli Ministry of Education.

KENDA MUTONGI, Member (2004–05) in the School of Social Science, has been awarded the 2018 Hagley Prize in Business History for her book *Matatu: A History of Popular Transportation in Nairobi* (University of Chicago Press, 2017), which she wrote during her time at the Institute.

NOAH SALOMON, Member (2013–14) and Visitor (2014) in the School of Social Science, has received the American Academy of Religion’s Award for Excellence in Analytical-Descriptive Studies for his book *For Love of the Prophet: An Ethnography of Sudan’s Islamic State* (Princeton University Press, 2017), which he completed during his time at the Institute.

Didier Fassin Receives NOMIS Distinguished Scientist Award

Didier Fassin, James D. Wolfensohn Professor in the School of Social Science, has been recognized with the 2018 NOMIS Distinguished Scientist Award, which is presented to exceptional scientists in support of their exploration of unconventional academic paths. The first social scientist to receive the award given by the Zurich-based NOMIS foundation, Fassin will use the award grant, nearly \$2 million over five years, to implement a project that will analyze contemporary crises from a global perspective.



Didier Fassin, James D. Wolfensohn Professor, during a Social Science seminar

“Didier is one of the most penetrating and enlightening thinkers of our time on issues spanning morality and immigration to punishment and our different valuations of life,” said Robbert Dijkgraaf, Director of the Institute for Advanced Study and Leon Levy Professor. “The Institute is delighted that Didier’s work has been recognized with the NOMIS award, which will enable him to further our knowledge of one of the universe’s most complex phenomena—human behavior and its societal meaning and consequences.”

Fassin’s project, “Crisis: A Global Inquiry into the Contemporary Moment,” will examine the ubiquity, in today’s world, of the notion of crisis, which has been applied to most domains of human life—social, economic, political, moral, and cognitive. It will analyze how this pervasive presence of the language of crisis signals something about the present that is both objectively identifiable and subjectively experienced. It will explore, through a multi-sited study conducted on five continents and mobilizing different disciplines, the multiplicity of the forms of, and responses to, crises. The aim of the project is to push further the frontiers of the social sciences, both geographically, through an opening toward a global perspective, and epistemologically, through the encounter with neighboring fields.

Appointed to the Faculty of the School of Social Science in 2009, Fassin is an anthropologist and a sociologist who has conducted fieldwork in Senegal, Ecuador, South Africa, and France. Trained as a physician in internal medicine and public health, he dedicated his early research to medical anthropology, focusing on the AIDS epidemic and global health. He later developed the field of critical moral anthropology, which explores the historical, social, and political significance of moral forms involved in everyday judgment and action as well as in the making of national policies and international relations. He recently conducted an ethnography of the state, through a study of urban policing as well as the justice and prison systems. His current work is on the theory of punishment, the politics

of life, and the public presence of the social sciences.

His most recent inquiry is a critical engagement with philosophical approaches to punishment, which was the subject of his Tanner Lectures on Human Values at the University of California, Berkeley, and to life, which was the topic of his Adorno Lectures at the Goethe University of Frankfurt.

Fassin earned his M.D. from Université Pierre et Marie Curie in 1982, completed his Master’s degree at La Sorbonne in 1986, and his Ph.D. at École des Hautes Études en Sciences Sociales in 1988, where he continues to serve as director of studies. He was the founding director of the Interdisciplinary Research Institute in Social Sciences at the National Center for Scientific Research in Paris.

He writes for the French newspapers *Le Monde* and *Libération*, and occasionally for the *Nation* and the *London Review of Books*. His recent books include *The Empire of Trauma: An Inquiry Into the Condition of Victimhood* (2009), *Humanitarian Reason: A Moral History of the Present* (2011), *Enforcing Order: An Ethnography of Urban Policing* (2013), *At the Heart of the State: The Moral World of Institutions* (2015), *Prison Worlds: An Ethnography of the Carceral Condition* (2016), *The Will to Punish* (2018), and *Life: A Critical User’s Manual* (2018). Among his awards are the Gold Medal of the Swedish Society for Anthropology and Geography 2015; the William A. Douglass Prize in Europeanist Anthropology 2010; and the Chevalier des Palmes Académiques 2007. ■

Mark Heising Appointed to Board of Trustees



Mark Heising

The Institute for Advanced Study has appointed Mark Heising to its Board of Trustees, effective October 28, 2017.

Mark Heising is founder and managing director of Medley Partners, an investment firm established in 2004 and located in San Francisco, California. Previously, Heising worked as a chip design engineer and subsequently founded VLSI Cores, which designed and licensed cryptographic integrated circuits. He holds six U.S. patents in cryptography, compression, and data communications.

Heising serves as director for Lam Aviation, Sion Power, Siva Power, and Nucleus Scientific. He also serves on the Board of Directors of the Bipartisan Policy Center, the Environmental Defense Fund, and the Heising-Simons Foundation. He earned a Bachelor of Science degree in physics and a Master of Science degree in electrical engineering and computer science, both from the University of California, Berkeley. ■

A Groundbreaking Ceremony for Rubenstein Commons

An essential resource for intellectual and social interactions on the Institute campus

The Institute for Advanced Study hosted a groundbreaking ceremony on March 14, 2018, for Rubenstein Commons, a new \$20 million campus building that will provide a necessary space for enhanced communication and collaboration among Faculty and scholars at one of the world’s leading centers for curiosity-driven basic research.

Rubenstein Commons, which is designed by Steven Holl Architects, is made possible by a gift from Institute Trustee David M. Rubenstein, philanthropist and cofounder and co-executive chairman of the Carlyle Group.

The groundbreaking ceremony was attended by David Rubenstein, architect Steven Holl, Princeton Mayor Liz Lempert, as well as Institute Trustees, Faculty, scholars, and staff.

“The Rubenstein Commons building underscores the importance and relevance of the Institute’s unique, independent, and cross-disciplinary environment for scholars,” stated Robbert Dijkgraaf, Director and Leon Levy Professor. “This building will provide scholars with new opportunities to question fearlessly, collaborate, discover, and create new lines of inquiry and knowledge that change our understanding of the world.”

“The Institute is a true national treasure, bringing together the greatest minds to solve some of the world’s greatest problems,” added David Rubenstein. “I am extremely proud to be associated with the Institute and its quest to make society better.”



Architect Steven Holl (left), Trustee David Rubenstein (center), and Director and Leon Levy Professor Robbert Dijkgraaf (right)

“On this special day, we celebrate the Institute’s rich academic history and its inspiring future, and move one step closer to the realization of this important piece of architecture. We hope the new generation of scholars will enjoy the Rubenstein Commons as it brings the community together with inviting spaces,” said Steven Holl.

The Commons is conceived as a welcoming and flexible environment for interaction among the permanent Faculty and visiting scholars, and will greatly enhance the Institute’s role as a convener of academic thought and activities across the sciences, humanities, and social sciences. The building will be located to the east of Fuld Hall to provide convenient access for resident scholars and short-term

visitors, and will feature a conference space, meeting rooms, and a lounge with a cafe. The Commons will also house office space and will be a venue for displaying images and materials that illustrate the Institute’s remarkable history, its extraordinary significance and influence throughout the world, and its exceptional scholarly community through exhibits, images, and archival materials. ■

Recommended Viewing:

Watch the remarks from Robbert Dijkgraaf, Director and Leon Levy Professor, Princeton Mayor Liz Lempert, architect Steven Holl, and Trustee David Rubenstein on the occasion of the groundbreaking ceremony: ow.ly/ub2a30jzWTT.

The Beginnings of Authoritarian Culture in the Arab World

The persistence and resilience of undemocratic government in Syria

BY KEVIN W. MARTIN

As recent events have demonstrated, one of the most significant phenomena of the Arab world's modern history is the persistence and resilience of undemocratic government. Syria has enjoyed the dubious distinction of leadership in this respect, its experience foreshadowing and/or exemplifying that of its neighbors. The pattern was established in 1949, when Syria experienced three coups d'état that installed a succession of military rulers. All of these coups were planned and executed by Army Colonel Adib al-Shishakli, who today is largely forgotten in Syria, and remains an obscure figure to all but a narrow circle of historians and political scientists outside the country. This is a considerable oversight, for after seizing power on his own behalf in December 1949, al-Shishakli effectively ruled Syria for much of the next five years, during which he wrought long-term changes in Syria's political culture and initiated a host of policies and practices subsequently adopted by Egypt's Gamal Abdul Nasser, Syria's Hafez al-Assad, Iraq's Saddam Hussein, and other authoritarian rulers throughout the region.

Al-Shishakli aggressively pursued an ambitious program of national development that aimed to transform Syria's political economy, governmental structure, and social relations. The resulting populist, corporatist, and authoritarian institutions and practices provided a legacy of undemocratic precedents as well as the institutional framework for the Ba'th Party and Hafez al-Assad's implementation of yet more transformative measures in the 1960s and 1970s.

More significantly, al-Shishakli's efforts to reorder Syrian political life included the abolition of existing political parties, and their replacement with a Pan-Arabist mass-mobilization organization, the *Harakat Tahrir al-Arabi* (Arab Liberation Movement). Focused on his person, this organization, along with a vastly expanded system of state-supervised print and broadcast media, was instrumental to the articulation of an authoritarian, state-guided public culture that was unprecedented in the Arab world. The most distinctive feature of this new public culture was al-Shishakli's cult of personality, an innovation that would have dire consequences for the future politics of Syria and the region.

Although this experiment occurred three decades prior to the appearance of Hafez al-Assad's personality cult, scholars have routinely characterized the latter as an unprecedented phenomenon in Syrian history. The scholarly consensus also presumes that the "leader cults" of post-WWII Marxist dictators—Stalin, Mao, Nicolae Ceaușescu, Enver Hoxha, and Kim Il-Sung—provided the only possible precursors for the elaborate leader cults of Hafez al-Assad and Saddam Hussein. In fact, al-Shishakli's cult provided the most obvious model for Assad's, which mimicked its predecessor in a number of significant ways.

Furthermore, the genealogy of modern personality cults is more complex and varied than conventionally assumed. The personal histories and interests of al-Shishakli's advisers and cult architects suggest a source of inspiration remote from the practices of Socialist regimes. All of the available evidence indicates that the cult was informed, at least in part, by the practices of American business and political culture. In keeping with the principles formulated by founding theorist of public relations Edward Bernays, al-Shishakli's advisers used his expanded apparatus of propaganda and persuasion to identify, exaggerate, or invent threats, enemies, "lacks," "absences," or problematic social conditions. Then they presented the "remedies" for these ills: the protection provided by al-Shishakli's leadership and his command of Syria's expanded and valorized armed forces, police, and security services.

Adib al-Shishakli was a veteran of the French Mandate-era *gendamerie*, the post-independence Syrian Armed Forces, and *al-Jaysh al-Inqadh al-Arabi* (The Arab Salvation Army), a multinational force created to combat Zionist paramilitaries in Palestine. Embittered by this last experience, al-Shishakli became convinced that the Arabs' humiliating defeat was attributable to the indifference, incompetence, and corruption of the Arab states' civilian politicians. This explains his role as the key actor in all five of Syria's post-independence military coups. In 1949, al-Shishakli commanded the forces that overthrew Syria's civilian government, the regime of General Husni al-Za'im, and that of al-Za'im's successor, General Sami al-Hinnawi. Al-Shishakli characterized this last intervention as a "correction" of al-Hinnawi's posture favoring union with the British-allied Hashemite monarchy in Baghdad. Twenty-one years later, Hafez al-Assad would use the same term to describe his coup against his "excessively" Leftist comrades in the Military Committee of the Ba'th Party.

Upon assuming control of Syria's government, al-Shishakli proposed a developmental program that encompassed the revision of Syria's civil and criminal codes, restructuring the system of land tenure, reformulating relationships between capital and labor, the founding of a national bank, expanded access to all levels of education, universal conscription, women's suffrage, a progressive tax code, the forced settlement of pastoralists, and a host of other measures designed to stimulate agricultural and industrial production, raise the living standards of peasants and workers, and increase state revenue. As many of these initiatives were inimical to the interests of Syria's entrenched political and economic elites, they could not be realized through conventional modes of politics.

Thus in November 1951, al-Shishakli overthrew the civilian figurehead government he had previously installed, dismissed its cabinet, dissolved parliament, banned most political parties, abolished the Supreme Court, suppressed influential newspapers, prohibited students, teachers, government employees, and trade unionists from engaging in political activity, and compelled schoolmasters, university professors, and the senior ranks of the civil and foreign services to take an oath of loyalty to his regime and person. Many of these measures would be reinstated by the series of Nasserist and Ba'thist regimes that subsequently ruled Syria.

Al-Shishakli then appointed a trusted surrogate as president, prime minister, and army chief of staff, while retaining for himself the office of Deputy Chief of Staff of the Syrian Armed Forces. Freed from civilian interference, al-Shishakli retrained, reequipped, and expanded Syria's armed forces, police, and security services, and executed politically motivated purges of these institutions, as well as the civil service, the judiciary, and most government ministries.

In addition, he focused considerable energy on the social and cultural spheres, where his regime's initiatives displayed an equal measure of statist, secularist, and xenophobic tendencies. As al-Shishakli attributed the influence of religious and ethnic minorities to French Mandate policies of "divide and rule," he now strictly regulated public speaking by leaders of minority sects, required that Muslims have equal representation on all bodies governing non-Muslim organizations, forbade the use of "foreign" names for places of lodging and entertainment, and mandated that all public events be conducted exclusively in Arabic. In addition, al-Shishakli ordered instructors at the

Homs Military Academy to institute a quota system minimizing the number of minorities (i.e., those who were not both Sunni Muslim and Arab) graduating from the institution, and dissolved the Syrian branch of the Muslim Brotherhood. Other decrees targeted practices and privileges long enjoyed by members of all faiths: publicly wearing garments identified with specific religious beliefs and practices was now subject to regulations, and the requirement of religious education was eliminated from the curricula of public schools.

Al-Shishakli displayed comparable ambitions in the economic sphere, pursuing classic "import substitution," corporatist, and infrastructural expansion policies with vigor. His distrust of Syria's traditional political elites prompted a turn to Damascus's emergent industrial bourgeoisie. Al-Shishakli enacted protectionist policies and restrictions on organized labor that encouraged these proto-industrialist entrepreneurs to merge their companies into monopolistic enterprises and invest the accumulated capital in constructing factories in newly established industrial zones, thereby making them partners in his efforts to construct an autarkic economic regime.

In early 1953, al-Shishakli discarded all lingering pretense by dismissing his appointed "President and Prime Minister" Fawzi Selu. He then promulgated a new constitution, which provided for the direct election of a president wielding executive power over a newly constituted Chamber of Deputies and all other state institutions. On July 10, 1953, in an ominous portent of Syria's subsequent history, a plebiscite approved the new constitution and "elected" sole candidate Adib al-Shishakli as President of the Syrian Republic by a reported 99 percent of the vote. Between 1971 and 2000, Hafez al-Assad was repeatedly "elected" president by identical means and with similar margins.

The primary agent of al-Shishakli's authoritarian public culture was the new Syrian Broadcasting Service, which supervised the rapid centralization, expansion, and technological enhancement of radio programming and broadcasting. With this instrument, the dictator initiated the region's era of media wars, castigating domestic opponents and the rulers of neighboring states during live broadcasts. Equally important was an increase in the number and variety of state-owned periodicals echoing the regime's narrative. Crucial in this regard were the magazines

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The al-Shishakli regime's appropriation of American political culture, exemplified in the above caricature, which accompanied the state-sponsored article "Luminous Pages from the Life of a Leader," was instrumental in creating and sustaining the dictator's leader cult.

al-Idha'a al-Suriyya (Syrian Broadcasting), and *Majallat al-Shurta wa al-Amn al-'Amm* (The Journal of the Police and Public Security). Despite the latter journal's title, it was conceived and marketed as a mass-circulation publication covering news, sports, and entertainment. Yet, most of the journal's content explicitly conformed to al-Shishakli's authoritarian program, including regular features exhorting "moral" and "orderly" behavior, celebrating the police and security personnel's bravery, professionalism, and benevolence, and expressing gratitude for al-Shishakli's principled and selfless leadership.

The earliest issues of the *Journal of the Police and Public Security* included articles by senior security personnel explaining new measures aimed at the regimentation of social life. One example declared that, in order to prevent "improper behavior not in keeping with Syria's progress," new regulations required employees of hotels, restaurants, nightclubs, theaters, and cinemas to register with the police, receive instruction in the craft of identifying "anti-social" types, and wear specially designed uniforms appropriate to their rank and place of employment. Early issues of the journal also featured excerpts from speeches in which al-Shishakli emphasized the essential role of security service personnel in Syria's survival and development.

Yet al-Shishakli was sufficiently sophisticated to comprehend that the knowledge and skills necessary for the professional management of his infrastructure of propaganda and persuasion would not be found in the armed forces or security services. Thus, he turned to those with various forms of modern expertise: academics, technicians, bureaucrats, and most importantly, experienced journalists and polemicists.

One of these experts, Fu'ad Shabat, Professor of Law at the Syrian University and Secretary General of the Interior

Ministry, published the article "The Taming of Freedom in Our Times." After a lengthy excursus on the various forms of individual and collective freedom known throughout human history, Shabat declared that, "freedom is important, but it must be regulated in order to elevate men above the level of the jungle."

Another expert expressing such views was Fu'ad al-Shayeb, an experienced journalist, radio correspondent, and government bureaucrat. Al-Shayeb played a crucial early role in raising al-Shishakli's media profile, persuading the dictator to emulate United States President Franklin Roosevelt's practice of making evening radio addresses in an intimate, conversational style. In fact, the hiring of journalists as close advisers, the expansion of press and information offices in government ministries, and many of al-Shishakli's other innovations in the fields of media and public relations closely echoed FDR's New Deal- and WWII-era efforts.

But al-Shishakli's inner circle included others who were proficient in English and avid followers of American politics and media. The most significant of these figures were Ahmad 'Isseh, Qadri al-Qal'aji, and Nazih al-Hakim, who enjoyed unparalleled access to and influence over al-Shishakli. Ahmad 'Isseh had more than fifteen years' experience as a journalist, editor, and publisher, including a stint as UPI correspondent in Damascus, when al-Shishakli named him Director General of Syrian Broadcasting in 1953. Qadri al-Qal'aji had comparable experience as a journalist, editor, and publisher in Syria, Egypt, and Lebanon. In 1952, he became the director of al-Shishakli's press office, and subsequently as his Private Secretary. Attorney and former press officer of the Syrian diplomatic service Nazih al-Hakim served as the dictator's public relations adviser. When al-Shishakli decided to assume the presidency, al-Hakim supervised a media campaign that included placing massive posters bearing the leader's image in public places and distributing untold numbers of similar photographs to schools, government offices, mosques, and businesses, an obvious harbinger of the Assad regime's more comprehensive efforts two decades later.

Finally, during the period of al-Shishakli's first three coups, he received the advice of yet another practitioner of "engineering" public opinion a la Madison Avenue, CIA agent Miles Copeland. Stationed in Damascus from 1947 to 1950, Copeland immediately cultivated a close relationship with al-Shishakli. In this and in subsequent assignments, Copeland gradually refined his professional specialization, employing the tools of advertising, public relations, management consulting, and psychological warfare to promote and sustain leaders perceived as "pro-American," i.e., anti-communist.

As he prepared to assume the presidency, al-Shishakli announced the formation of the Arab Liberation Movement, the institutional expression of his vision for a corporatist, single party, and authoritarian state. Employing quasi-fascist rituals, ALM rallies engendered countless radio broadcasts, journal and newspaper articles, photographs, and newsreels. For example, the *Journal of the Police and Public Security* described a June 1953 rally in Damascus as a "glorious festival" at which al-Shishakli's arrival prompted "the applause of hundreds of thousands" who had

"flocked to the capital from all corners of the country," and whose "throats echoed chants about the deeds of Syria's national hero and savior who gave them lives of freedom and happiness." [i] A portion of al-Shishakli's speech was repeated by the crowd, swearing "allegiance to the leader," "his principles," and "his Arabist goals." [ii] Media accounts of these orchestrated events, which asserted the voluntary participation of Syrians from all walks of life, clearly foreshadowed those produced on a grander scale after Hafez al-Assad's seizure of power.

This media campaign was overseen by Qadri al-Qal'aji and Nazih al-Hakim, via yet another new institution, the Directorate General of Propaganda and National Guidance. This ingenuously named body distributed illustrated booklets featuring edited transcripts of al-Shishakli's radio addresses to schools, libraries, bookstores, military installations, and government offices, and published adulatory essays accompanying these transcripts. A typical example of the latter, Qadri al-Qal'aji's "Adib al-Shishakli: The Life of a Nationalist Hero," appeared in *Syrian Broadcasting*. After recounting familiar tales of the leader's principled and courageous resistance to French tyranny and Zionist aggression, al-Qal'aji praised the "true apostle of Arabism" for overthrowing Syria's elected government, an act he characterized as a "national necessity" at "this critical juncture in the history of our homeland." [iii]

Similarly, the inaugural issue of the *Journal of the Police and Public Security* featured

AL-SHISHAKLI'S ADVISERS USED HIS EXPANDED
APPARATUS OF PROPAGANDA AND PERSUASION
TO IDENTIFY, EXAGGERATE, OR INVENT THREATS,
ENEMIES, "LACKS," "ABSENCES," OR PROBLEMATIC
SOCIAL CONDITIONS. THEY THEN PRESENTED
"REMEDIES" FOR THESE ILLS: THE PROTECTION
PROVIDED BY AL-SHISHAKLI'S LEADERSHIP

Director General of Police and Public Security Ibrahim al-Husseini's offering of thanks to God, the apostles, and the prophets for the divine favor bestowed upon Syria as it was guided "into its blessed renaissance" by the "leader-hero ... bearing a torch to light the way." [iv] By alluding to the ALM's symbol—a flaming torch held aloft—al-Husseini was deploying a principal metaphor in the leader cult's discourse. The torch and the leader's "voice" were symbols of agency,

employed throughout this discourse to portray al-Shishakli's leadership as the force endowing the people of Syria and the Arab world with the capacity to see and speak amidst the gloom and silence produced by foreign oppression.

Adib al-Shishakli's personality cult reached its apogee with the publication of issue #7 of the *Journal of the Police and Public Security*. Labeled the "leader issue," its contents were summarized as "noble aspects of the life of the hero who saved the country from chaos and provided hope for a free and happy life." Al-Shishakli was lauded as a "servant of the nation," a "warrior and conciliator," the "wise architect of the Arab Renaissance," the "virtuous helmsman" of Arabism, the "man who rescued the people from political chaos," and the "leader-commander-warrior-struggler" responsible for "introducing a new order" in Syria. [v]

In the same issue, Hind al-Qawwas, a prominent member of the ALM, contributed a lengthy and adulatory assessment of al-Shishakli's live radio broadcast explaining the major provisions of his draft constitution. According to al-Qawwas, the document would "restore" women's "usurped rights" and eliminate "forms of repression" that had "inscribed shame upon the brow" of Syria.

I sat listening to the national hero with admiration ... his deep voice undulating with warm national feeling. We who had an opportunity to witness this historic event experienced reverence and awe, and could hardly believe our eyes ... the great man was crying ... as the leader quietly departed the studio ... his sacred teardrops bathed and healed the wounds that imperialism, colonialism, and the disaster of Palestine made in our hearts. [vi]

Yet the most hyperbolic expression of al-Shishakli's cult was provided by Qadri al-Qal'aji, whose paean—"Luminous Pages from the Life of a Leader"—was accompanied by a caricature of al-Shishakli as the Statue of Liberty. [vii] This neat confluence of the ALM's logo—the flaming torch—and the cult's frequent, uncritical embrace of the visual language of American exceptionalism verges on kitsch. In this respect, the "aesthetics" of al-Shishakli's cult once again foreshadowed the patent absurdity of the Hafez al-Assad and Saddam Hussein cults.

In February 1954, an army rebellion led by many of the young officers al-Shishakli had favored with promotion compelled the dictator to flee Syria. These officers, in cooperation with prominent members of the old political elite, rapidly abrogated critical elements of al-Shishakli's governing system. Within days of al-Shishakli's departure, most of his senior government appointees and his close advisers and associates were dismissed from office, and many accompanied the dictator into exile.

Yet virtually all of the institutions of coercion and persuasion al-Shishakli had founded were retained and/or enhanced. This included the journals dedicated to his personality cult. The new General Manager of the *Journal of Police and Public Security*, attorney and senior civil servant Ihsan al-Qawwas, soon announced that, in response to "readers' desire," the journal's name had been

(Continued on page 6)

Celebrating Freeman Dyson's *Maker of Patterns: An Autobiography Through Letters*

Personal letters recount major advances of twentieth-century science

On April 13, the Institute for Advanced Study celebrated the publication of Freeman Dyson's *Maker of Patterns: An Autobiography Through Letters* (Liveright, 2018), a collection of letters he wrote to relatives between 1940 and the late 1970s. Throughout his seventy-year association with the Institute, sixty-five of them as a Professor, Dyson has embodied the Institute's purpose and mission, following his curiosity wherever it has led him and resulting in highly

original and important contributions to an astonishing range of topics, from quantum electrodynamics and number theory to adaptive optics. Dyson read several of his letters at the public event, followed by a discussion with Robbert Dijkgraaf, Director and Leon Levy Professor, the video of which may be viewed at ow.ly/HUBa30jzWYj. The following letter was the first reading by Dyson.



Freeman Dyson, Professor Emeritus in the School of Natural Sciences, read several of his letters at the Institute celebration, followed by a discussion with Robbert Dijkgraaf, Director and Leon Levy Professor, a reception, and a book signing.

Arrival at Princeton

September 14, 1948

A short ride from Philadelphia, across rolling downs and meadows, brought us finally to Princeton, which is a pleasant little old town, entirely supported by the university, and not in the least American-looking.

The university is a large collection of buildings, built in a solid gothic style in imitation of Oxford and Cambridge, in the centre of the town. The institute is a small building in the country, about a mile from the university, built in an unpretentious and utilitarian red brick. The pleasant surprise is that it is small and intimate, a good deal smaller than the physics building at Cornell. The institute is beautifully decorated and furnished. There is a lounge with the *Times* air edition and every other important newspaper and periodical, an excellent specialist library, a tea room, and private work rooms. I glowed with reflected glory as I walked past the doors bearing the names of Einstein, Weyl, von Neumann, and Gödel. I have been given a beautiful mahogany table in a beautifully carpeted room next door to Oppenheimer, where his five young physicists are put, to be near him and one another. I have not yet met my colleagues. When I visited the institute, there were more children there than grown-ups, Dirac with his family shortly leaving for England, and various other children playing cowboys and Indians, and von Neumann looking rather vague in the midst of the confusion. If I don't do well here, it won't be the institute's fault.

Recommended Viewing:

Watch Freeman Dyson discuss his new book with physicist and author Lisa Randall at the New York Public Library: ow.ly/SFsA30jEM1m.

AUTHORITARIAN CULTURE (Continued from page 5)

changed to *Sawt Suriya* (*The Voice of Syria*). Yet, al-Qawwas's editorial emphasized continuity rather than change. *The Voice of Syria* would, he pledged, "continue to fulfill the magazine's mission, achieve its objectives ... proclaim Syria's true message to the outside world, and combat the propaganda organized by its enemies in foreign countries." Thus, he expressed the hope that readers would "continue to think of this as their magazine, and feel that it was and will continue to be the voice of Syria, beloved Syria, emerging republic, and the true homeland of the Arabs, Arabism, and of the most glorious renaissance recorded in history." [viii]

In fact, other than the glaring absence of al-Shishakli, the journal's content displayed no discernable change. The same sports, entertainment, and *Police Gazette*-style crime features continued to appear, as did pictorials commemorating the sacrifice of police and security service personnel and warnings about the ever-present threat of Zionism and other sinister, "alien" forces. In fact, in this and other venues, the use of Madison Avenue-style techniques to stimulate anxiety, deployed so ably by al-Shishakli's team of media experts, continued unabated.

Furthermore, a flaming torch, the symbol of al-Shishakli's Arab Liberation Movement, and a constant feature of his regime's iconography and discourse, was now adopted as the journal's logo. This symbolic appropriation, along with the Orwellian choice of title to designate a journal published by the security services, signifies the ironic nature of Adib al-Shishakli's legacy: Syria, long deprived of the capacity to "speak" in international affairs, would now be "heard" through the pronouncements of its Public Security Police. And despite Syria's immediate nominal return to the status quo ante al-Shishakli, the dictator's regime had wrought seemingly irreversible changes in the country's political culture. The

armed forces and security services refused to relinquish their influence on successive governments. And the army's experience of executing al-Shishakli's coups, enabling his dictatorship, and then overthrowing him in collusion with his enemies, transformed the institution into an inherently political entity that would, largely through its own internecine conflicts, perpetuate and exacerbate Syria's instability over the following decade.

After a failed attempt (with U.S. assistance) to return to power in 1957, Adib al-Shishakli receded into obscurity in Brazil, where he was assassinated in September 1964. Yet, the most distinctive element of al-Shishakli's system, the leader cult, would linger in official memory, only to reappear in grotesquely exaggerated form decades later. ■

Kevin W. Martin is Willis F. Doney Member in the School of Historical Studies. He is exploring the reach of American "soft power" by analyzing Syrians' exposure to and perceptions of public diplomacy, propaganda, films, advertising, and new modes of urban leisure. Drawing upon an array of Syrian and American sources, he is also analyzing Cold War cultural exchange.

- i *Majallat al-Shurta wa al-Amn al-'Amm* 7 (July 1953), 2.
- ii *Majallat al-Shurta wa al-Amn al-'Amm* 7 (July 1953), 3.
- iii *Al-Idha'a al-Suriyya* 1 (September 1, 1953), 6–7, 27.
- iv *Majallat al-Shurta wa al-Amn al-'Amm* 1 (January 1953), 1.
- v *Majallat al-Shurta wa al-Amn al-'Amm* 7 (July 1953), 1.
- vi *Majallat al-Shurta wa al-Amn al-'Amm* 7 (July 1953), 20, 24.
- vii *Majallat al-Shurta wa al-Amn al-'Amm* 7 (July 1953), 10–11.
- viii *Sawt Suriya* 16 (April 1954), 2.

Dark Matter: Discerning What We Cannot See

What keeps together all the stars and galaxies with its gravity, but does little else?

BY VERA GLUSCEVIC

The field of cosmology has come a long way toward understanding the universe as a physical system: we've mapped its history and structure in great detail, we know what it went through since a few seconds after its birth until today, we understand what sources its light, and we have a grip on the math describing the laws of gravity that govern the cosmic structures we observe. Yet, most of its content is locked up within the “dark sector” we cannot see and do not yet understand.

When I was a graduate student at Caltech, Annika Peter, a senior postdoc at the time, made a descriptive comparison between the universe and a cupcake: “The dough that makes up most of it, that's the dark energy [the stuff that causes it to expand at an accelerating pace]. The icing is dark matter. And the sprinkles on top—that's all the ordinary matter that we know and love.” At the Institute, I study the dark matter “icing” that keeps together all the stars and galaxies with its gravity, but does little else—it does not seem to emit or absorb light, nor do its constituents seem to collide much with ordinary particles. Specifically, I design and apply new ways to probe this mysterious substance, using a combination of theoretical and analysis tools, and data from a variety of observations and measurements. Here, I will give a brief summary of the status of the field and explain some of my most recent work.

We know that dark matter makes up about 80 percent of the total matter content of the universe because we observe how its gravitational pull affects normal matter (“baryons”) in a wide range of astrophysical systems. In the local universe, we see nearby galaxies (and our own) spinning at a far faster rate than if only stars and gas held them together, implying the presence of an additional unseen source of gravity. More distantly, we observe that clusters of galaxies bend the trajectories of light coming from even more distant objects (the effect known as gravitational lensing), far more prominently than their luminous matter alone could. And from the very dawn of the cosmos, the cosmic microwave background (CMB) radiation—a relic light emitted when the universe was only 400,000 years old—would have far more directional irregularity, or anisotropy, if dark matter were absent or made up of ordinary baryons. Most importantly, these different pieces of observational evidence give a precise quantitative picture of how much dark matter there is, and how it is distributed—and all of them agree. Dark matter has been around since before the CMB was emitted, and today every galaxy lives within a heavy dark matter blob we call its “halo.”

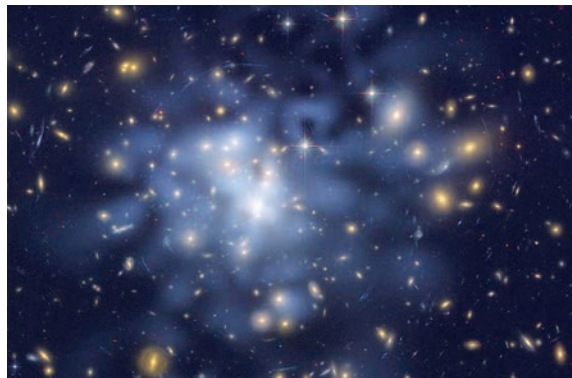
Leading theories of dark matter involve a new kind of fundamental particle, or particles (though there are more exotic proposals, for example, involving dark matter made out of “primordial black holes”... but I will only discuss particle physics models here). Many theories predict some amount of interaction between dark matter and the known particles. Mapping out the basic properties of dark matter constituents—their mass, charge, spin—and understanding how they interact (between each other and with baryons) is one of the main open quests in modern physics. Many avenues of probing dark matter have been explored to date. Some attempt to detect photons or electrons that would be produced if dark matter particles collide and annihilate in centers of galaxies, such as our own. Others search for traces of dark matter particle production in collider experiments (like the Large Hadron Collider). Traditionally, the most sensitive searches for dark matter particles have been so-called direct detection experiments.

Direct detection experiments look for rare collisions of dark matter with nuclei in experimental targets (large chambers with xenon, germanium crystals, etc.) in underground detectors. They rely on the idea that, as the Sun rotates around the galactic center, it sweeps its way through the sea of dark matter that is our own dark matter halo, subjecting the Earth—and the detectors in its underground labs—to a “dark matter wind.” As dark matter appears very small to baryons (in technical terms, the cross section for collisions between dark matter and nuclei must be very, very small, otherwise we would have already detected it), the extensive shielding of the experiments does not stop it, and the elusive particles pass straight through the earth and the detectors. Nearly always, this goes unnoticed, even though there are about a hundred million of them passing through each of us every second, if dark matter is ten times heavier than a proton (and even more if it is lighter)! Very rarely one might bump into a target nucleus and be detected that way. Current-generation experiments (e.g., LUX, Xenon, CDMS, PICO) have yet to make a detection. However, a new generation of bigger targets and more sensitive measurements is forthcoming, and direct detection of dark matter might be around the corner.

In light of this, part of my work at the Institute has focused on understanding,

by means of numerical computer simulations and analysis, what information we may learn from these experiments. One important conclusion I came to was that, even if the signal they see turns out to be as strong as possible (given that none of the current experiments have yet seen it), we might be able to measure the mass of a dark matter particle, but we will not be able to use this data to confidently confirm or falsify specific dark matter theories. The data will not have enough statistical power to address such interesting questions. We thus must search for alternative and complementary ways to probe the physical nature of dark matter.

That brings me to another important point about these traditional searches for dark matter particles: the nuclear measurements they are making cannot detect collisions with particles lighter than the proton. The absence of a signal to date might then simply be due to dark matter's mass lying below the current detection thresholds. As a cosmologist, I use cosmological and astrophysical observations, and in particular the observations of the CMB, in order to test fundamental physics. It was natural for me to turn to thinking about ways that the CMB measurements can be used to search for evidence of dark matter particle physics. Before I explain how, let me first give you a brief overview of what the CMB actually is, and what it can tell us.



The distribution of dark matter (tinted blue) in the galaxy cluster Abell 1689

NASA, ESA, D. COE, N. BENTZ, T. BROADHURST, AND H. FORD

Shortly after the Big Bang, the universe was a fairly uniform, dense, and hot mix of particles—photons, protons, electrons, and dark matter (and traces of other things)—all moving together. Protons and electrons were in a state of acoustic oscillation: gravity from dark matter clumps would pull them, and they would compress, heat up, and expand under the pressure of photons that were pushing on the electrons in the plasma; this expansion would in turn cool them down again, and the process would repeat. If you imagine oscillations of a ball hanging on a spring, the gravitational field of the Earth would be analogous to that of dark matter clumps in the early universe, and the restoring force of the photons is like the elasticity of the

spring. The two acting together make a ball oscillate up and down—or, in our case, the baryons compress and rarify in a cyclic way.

Once the universe expanded and cooled enough (to a temperature near that of a star's surface), the photons were set free to travel all the way to our present-day observatories—these are the CMB photons. And the image they depict in the sky—the tiny differences in their temperatures in different directions—reflect the processes that were happening in this early universe.

Now, if dark matter scatters off protons today, it was doing so even more often at early times, when the universe was tightly packed with fast-moving particles. As a result of these collisions, dark matter clumps collapsing under gravity would exert a friction force on the oscillating baryons—imagine dunking our ball on a spring into a bucket of water. The friction damps the oscillations, especially the high-frequency waves. The damping effect would be captured by the CMB light as an unusual lack of small irregularities—“smoothing”—in its temperature in the sky. In technical terms, the power spectrum of the CMB temperature (and polarization) would show a suppression on small angular scales.

While studying this effect, dark matter physicist Kimberly Boddy from Johns Hopkins University and I have very recently performed the first full cosmological search for evidence of dark matter particle collisions in the early universe, using data from the Planck satellite. In a series of studies, we probed particles as light as one thousandth of an electron mass (a million times lighter than the typical sensitivity threshold of direct detection experiments). We also used the so-called “effective theory of dark matter interactions” to systematically categorize all possible interaction theories and constrain them. We are now preparing to apply this analysis to state-of-the-art CMB measurements made by the Atacama Cosmology Telescope collaboration (based at Princeton), in order to further push the bounds on dark matter interaction physics.

So far, we haven't found the signal we are looking for. But a tremendous amount of data is imminently coming from galaxy surveys and from the next-generation CMB measurements that will make cosmological observations one of the main avenues for testing fundamental physics. With my recent work at the Institute, we were able to peer back at what fundamental particles were doing when the universe was only two years old ... we can now dare to imagine what happened even before. ■

Vera Gluscevic is a Member and Schmidt Fellow in the School of Natural Sciences whose research focuses on using cosmological and astrophysical observations in combination with other data sets to study new fundamental physics. In particular, she focuses on dark matter and dark energy, theory and analysis of the cosmic microwave background, dark matter direct detection, cosmic reionization, and 21-cm cosmology. She is a theorist-in-residence for the Atacama Cosmology Telescope and the Simons Observatory collaborations.

The Scientist as Antiquarian: History, Climate, and the New Past

How could the constant interaction between humans and nature not be part of history?

BY NICOLA DI COSMO

Half a century ago a French historian of rural Languedoc published a history of climate and people: climate changes, is subject to fluctuations, and (since history is about change) climate is the object of history.² Le Roy Ladurie's implied (if imperfect) syllogism captures perfectly the essence of the relationship between climate and history, natural and human systems, laboratory data and written sources.

To be clear, climate is neither nature nor environment. Climate is not even the weather. Climate is connected with and produced by the Earth's system, affected by the solar system, and its variations transform ecologies: dry to wet, cold to warm, and vice versa, in different degrees of intensity and duration. Until recently, climate variability was caused only by a series of interacting natural forces that determined the length of seasons, the amount of rainfall, and the temperature of the atmosphere at different latitudes. Human beings had to face the consequences of this variability, enjoying balmy days while preparing for poor ones, feasts and famines punctuating the life cycles of humanity. How could this constant interaction between humans and nature not be part of history?

And yet, until the publication of Ladurie's *Histoire du climat depuis l'An Mil*, historians paid scarcely any attention to climate variability. The past was confined largely to its human dimensions: social, economic, political, cultural, and intellectual. Even environmental history, coming of age in the 1980s, has been coy about climate. In a seminal article, Richard White, discussing the development of environmental history as a new historical field, mentioned climate only twice, both in relation to environmental determinism.³ Determinism and reductionism, meaning the belief that natural forces are ultimately responsible for much of history, and that historical explanation can be reduced to such forces, have been at once *bête noire* and whipping boy of historians at least since the early twentieth century, when Vidal de la Blache and Lucien Febvre criticized geographical and climatic determinism à la Ellsworth Huntington in favor of human choice and social response *vis-à-vis* environmental constraints. The debate goes on to this day. Historians are often accused of blindness to the vital connections between societies and natural resources, while scientists of various disciplines (from geography to the life sciences) are blamed for giving too much weight to non-human forces. Renowned biologists and economists such as Jared Diamond and Jeffrey Sachs have been entangled in similar controversies. However, the persuasion that geography (topography, natural resources, and climate) led to the rise and collapse of complex societies and civilizations seems too often based on a smorgasbord of presumed advantages that are weighted differently in favor of the end result: a teleological bias of which historians are keenly conscious.

In actual historical research, such lionization of nature has been partly validated and partly corrected by the rise of "big history." It is not surprising that within a history spanning a geological scale, from the Big Bang to the present, the greater story of Earth as a life-giving system dwarfs the total human past, even when such past remains a central concern. Most historians, working at a finer level of detail, and concerned with questions such as the rise of monasticism, the evolution of imperial bureaucracies, or the role of women in the industrial revolution, regard the reduction of causation to rainfall and temperature as irremediably daft. Today the resurgence of historical determinism (or "neo-determinism") is notable not just in the popular press, but also in some areas of the natural sciences, especially climatology. Hong Kong climate scientist David Zhang has recently made the explicit claim that the whole of history can be arranged in a succession of "dark" and "golden" ages determined uniquely

by climatic change.⁴ New data and methodologies are brought to bear to support a vision of the human past that can be interpreted in light of chains of causation ultimately triggered by natural forces. This theoretical orientation, no matter how impossibly naïve, is indicative of science's ability today to produce information about the past that is unprecedented in terms of quality and quantity, that captures environmental stressors at every latitude and at scales (annual and decadal) that are familiar to historians. Should historians take note?

With a wink and a nod to C. P. Snow, veteran environmental historian Donald Worster discussed already in 1996 the "two cultures" of environmental science and environmental history. Speaking of the growth of environmental

science, he prophetically stated: "[A] new door has begun to open, but where does it lead? It leads, I think, to a new picture of the human past that is unlike anything that you will find in the standard history books. It leads to a past wider in scope than any of our national territories [...] as old as the species itself, and yet as new as the automobile, or aerosol sprays, or the greenhouse effect."⁵ The article addressed growing concerns about the challenges of climate change, and the moral need to confront its global threat, but it also urged a greater collaboration between scientists and environmental historians.

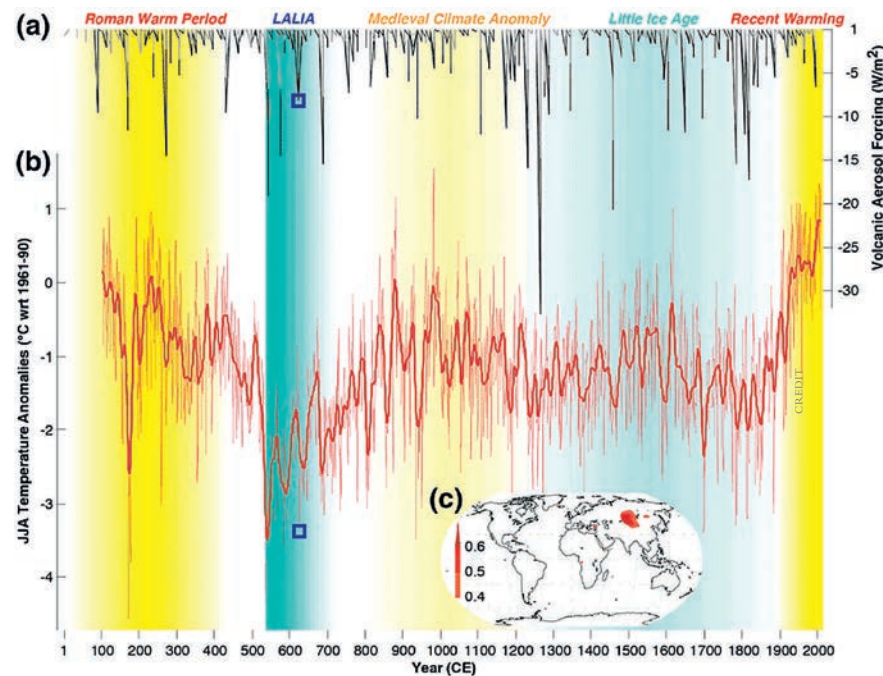
The same need seems to concern history *tout court*. Science can address a variety of questions that many historians routinely grapple with: How many people, plants, and animals can a given environment sustain? What is the impact of water availability on human activities? How does a society respond to natural catastrophes? It is significant that while the causes of peasant rebellions in China

were once attributed to the landlords' fiscal rapacity, now historians explore climate changes and their effects on agricultural production. Historians have also been interested in special times when climatic changes seemed to wreak havoc the world over. The climatic cooling of the seventeenth century—the coldest of the "Little Ice Age"—studied by Geoffrey Parker on a global scale, seems responsible for so much human misery, captured in records from China to England and from Japan to Mexico. But how would we know how bad it truly was, if not for climatic reconstructions?

A popular word in historical writing today is "nuance." Nuance is very much in the eye of the beholder, but if by a "more nuanced history" we mean a more detailed context, one that places the often stark contours of war, politics, and religion against a chiaroscuro backdrop of variable climate and changing ecology, we might obtain a "nuance" that actually helps us penetrate more deeply into the meandering tangles of historical currents. This consideration is immediately redolent of Fernand Braudel's *temps de l'histoire*, whereby the jittery concatenation of events is cast, interpreted, and narrated against the slower flow of social and environmental changes. Is that imagined relationship about differential-speed temporalities still tenable when science graphs show equally jittery timelines tracing climatic changes on a yearly basis?

It was over a hundred years ago that weather measurements through instrumental means became common in various parts of the globe, and weather stations began tracing climatic variations. In order to extend climatic reconstructions to the remote past, scientists have developed a variety of techniques that capture atmospheric changes. Paleoclimatologists mine ice cores, tree rings, speleothems (cave formations), lake sediments, paleosols, and other "natural archives" for proxies that yield clues about climatic changes. Spatially specific and chronologically accurate drought and temperature indices can provide a degree of precision that ideally will allow historians to compose an accurate climatic picture of the region and period of their concern. It is not uncommon today to read in history books how climate reconstructions are influencing

(Continued on page 9)



Climatic reconstructions from Di Cosmo et al., "Interplay of Environmental and Socio-Political Factors in the Downfall of the Eastern Türk Empire in 630 C.E."¹

ANTIQUARIAN AND SCIENTIFIC RESEARCH
PROVIDE KNOWLEDGE THAT CAN BE USED
AS BUILDING BLOCKS OF THE HISTORICAL
NARRATIVE, ANCHORING IT TO A
MATERIALITY AND A PROCESS OF CRITICAL
APPRAISAL THAT CONSTANTLY
SUPPLEMENTS, INTERROGATES, AND
REDEFINES THE LITERARY SOURCES.

historical interpretations, down to the recent *The Fate of Rome: Climate, Disease, and the End of Empire* by Kyle Harper.

That historians are learning more about climate science, and are willing to labor their way through a maze of unfamiliar scientific journals, could be taken as either humility or hubris. Be that as it may, the transfer of knowledge from one epistemological community to another, while a welcome development, should come with a thick “user’s manual.” Science-inclusive narratives may add an important dimension to historical knowledge and allow reinterpretations in light of better and denser data, but deterministic temptations still lurk in the background for a simple yet insidious reason: how much weight should be attributed to environmental data in historical explanations? Given that non-scientists’ uses of laboratory data are inevitably detached from both theoretical knowledge and technical means of production, it is questionable whether historians can eventually control the scientific narrative to the full satisfaction of readers and colleagues, not to mention the scientists.

Let us pause for a moment to consider another period in which the historical profession underwent a transformation that presents an uncanny resemblance to our “scientific turn.” In the seventeenth and eighteenth centuries the rise of antiquarian knowledge—from archaeological relics to genealogies, epigraphical evidence, and numismatics, among others—ushered in a new type of history. As Arnaldo Momigliano put it, “the antiquaries, by collecting much of their evidence outside of the literary sources, helped to make the need for new histories apparent.”⁶ The search for truth and authenticity in history could make use of a vast array of nonliterary evidence, drawn from “charters, inscriptions, coins, and statues”; such a knowledge allowed the antiquarian to “venture into old and new fields with a confidence that his predecessors lacked.”⁷ By the same token, might we not say that the twenty-first-century historian, armed with scientific data, can also produce new histories and venture to answer old and new questions with unprecedented assurance? It is a tempting analogy. Like antiquarian inquiry, the paleosciences offer specialized knowledge applicable to historical questions, expand the range of evidence, and provide new interpretative tools. Moreover, while both the paleoscientists of today and the antiquaries of old construct(ed) their versions of the past, neither writes/wrote history. The point of antiquarian and scientific research, and their game-changing force, is that they provide knowledge that can be used as building blocks of the historical narrative, anchoring it to a materiality and a process of critical appraisal that constantly supplements, interrogates, and redefines the literary sources.

Seen in the light of the antiquarian precedent, there is reason to believe that the contribution of the sciences of the past to historical research can help produce new histories. Yet, a word of caution is required. Scientific knowledge and antiquarian knowledge are different in fundamental ways. It is true that the antiquarians were often engaged in science, and that their methods, especially in terms of observation, collection, and classification of evidence, were not too far removed from those of the astronomer or entomologist. But science today, in its highly professionalized, highly competitive, and epistemologically dominant position, produces a quantity of data that historians, even if they acquired a general understanding of it, cannot easily control, and therefore cannot easily use. Science data are scattered across hundreds of publications, expressed in an unfamiliar language, and in constant and often controversial flux. How is the historian going to chart a path in such a jungle of scientific papers? Moreover, historians cannot produce data on their own, and therefore depend on figures and facts produced by scientists for very different purposes. Even though, like antiquarian research, science can assist historians with new and better evidence, chances are that historians can only use a tiny fraction of the available information, possibly not entirely relevant nor fully understood. Confidence is further eroded by instances in which science data are collected selectively by historians to provide a veneer of “hard evidence” to hypotheses founded entirely on different grounds.

Given these shortcomings, it is not surprising that the deployment of climate science for the study of the human past is often the result of collaborative research, whereby scientists, historians, and archaeologists join forces.

Experiments in this direction have been mushrooming for a while and present distinct advantages. First and foremost, scientists keep historians honest and informed about what science can and cannot do. Secondly, the data are checked professionally with regard to both the methods and the reasoning behind them. Moreover, collaboration between scientists and historians can produce data specifically designed to address questions asked by historians.

Surely many narratives can be enriched and transformed by science, but it is probably those corners of the human past least illuminated by troves of archival documents that will benefit most from the sustained exploration of paleoclimatic data. With difficulty, and only recently, the study of pre-literate societies has begun to move from the realm of ethnography, archaeology, and anthropology

to that of history thanks largely to the development of world and global history. Approaches to world history in which interpretation hinges on concepts such as connectivity, exchange, and transcultural communication—along with more traditional ones such as migration, crisis, and conquest—may be especially receptive to new evidence that might shed light on the historical role played by peoples who have otherwise left few traces. Central Asian nomads, such as Scythians, Huns, and Mongols, figure prominently in this history, given their continent-wide migrations, participation in “Silk Road” exchanges across Eurasia, and conquests of other peoples and regions.

Of late, the Institute has facilitated collaborative research among historians, archaeologists, and scientists on various projects that combine climatic, material, and textual evidence. Through relatively limited case studies—for instance, involving the Mongol and Turkic empires—rather than expansive narratives, collaborative research has yielded results that inspire a degree of

faith that scientific evidence may illuminate still obscure yet consequential areas of human history. Even more intriguing are cases involving catastrophic events about which climatic reconstruction offers undeniable proof while the written sources are silent. Data that show the exact degree of severity of an extended drought in medieval Mongolia, otherwise invisible in the literary sources, raise the question, for instance, of what the affected people might have done to counter the ill effects of the drought.⁸

As new data emerge, new conjectures can be explored, formulated, and verified, and it is exciting to see how the discovery of the palaeosciences by historians evokes the experience, centuries ago, of those who used antiquarian knowledge to change our perception and understanding of the past. ■

Nicola Di Cosmo joined the Institute as Luce Foundation Professor in East Asian Studies in the School of Historical Studies in 2003. His main field of research is the history of the relations between China and Inner Asia from prehistory to the modern period. His most recent works explore the use of proxy data from climatology and other palaeosciences in the study of the history of China and Central Asia, with special reference to early Eurasian nomads, the Mongol empire, and the Qing dynasty.

- (a) Ice core-derived hemispheric (light gray) and global (dark gray) estimates of volcanic aerosol forcing (Sigl et al. 2015). (b) Reconstructed June–August temperature means from the Russian Altai (Büntgen et al. 2016), with the smoothed curve referring to twenty-year low-pass filtering (dark red). The blue boxes indicate 626 C.E. and the colored background shadings suggest the timing of major climatic episodes during the last two millennia. (c) Spatial field correlations (1950–2011) of the Altai summer temperature reconstruction against the global “Berkeley” dataset (Rohde et al. 2013) of gridded 1° latitude/longitude June–August temperature means. From: Di Cosmo, N., Oppenheimer, C., & Büntgen, U. (2017). “Interplay of Environmental and Socio-Political Factors in the Downfall of the Eastern Türk Empire in 630 C.E.” *Climatic Change*, 145(3–4), 383–395.
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We Have to Go Beyond Identifying and Punishing Individual Men

The intertwining of power and gender in our culture and our psyches

BY JOAN WALLACH SCOTT

As controversy swirls in the wake of the revelations about the abuses of women by powerful men in the arts, politics, media, academia, restaurants, and elsewhere come to light, it is important to remember that we are dealing not with exceptional cases, but—as #MeToo demonstrates—with an enduring culture of masculinity. Women have the vote, but they are under-represented in legislatures; they have access to contraception and abortion, but those rights are under attack; they have been admitted to universities and to various professions, but they are consistently paid less than their male counterparts; even when they climb the ladders of corporate management, they hit glass ceilings again and again. Domestic violence plagues wives and mothers; impoverished single parents are most often female. And now we learn that workplace sexual harassment is a condition of employment for more women than we had ever imagined, women across the class and racial divides.

How can we reconcile this sorry state of affairs with the deeply held belief that women in the United States and Europe—the secular West—are the most emancipated in the world? How can we reconcile it with the polemic we often hear that it is the women of the non-Western world, particularly Muslim women, who are in need of liberation? “They,” we are told, are sexually repressed and so lack equality, whereas “gender equality,” and so sexual liberation, is a primordial value of the (Christian) secular West.

In *Sex and Secularism* I argue that, in fact, gender inequality is the story of modern Western nation states. It is an inequality that has persisted, despite genuine reforms and real improvements in the situation and status of women. As Vivian Gornick writes in the *New York Times Magazine* (December 17, 2017), there has been “insufficient progress” on the question of gender equality. “As the decades wore on, I began to feel on my skin the shock of realizing how slowly—how grudgingly!—American culture had actually moved, over these past hundred years to include us in the much-vaunted devotion to egalitarianism.” In conversation with me, Gornick attributed this delay to the hold of religion on our society, but I think that is to misunderstand the ways in which power and gender have been associated in our democratic, secular worlds.

The intertwining of power and gender is the product of history, but they are so deeply naturalized that it has been hard to disentangle. Religious justifications for the inequality of women and men gave way from the eighteenth century on to natural justifications; increasingly biology explained why women couldn’t be citizens. When women were barred from attending political meetings during the French Revolution in 1793, the reason given had nothing to do with God. Asked one legislator rhetorically: “Has Nature given us breasts to feed our children?” In a similar but kinder vein, Thomas Jefferson found that “our good ladies ... have been too wise to wrinkle their heads with politics. They are content to soothe and calm the minds of their husbands returning from political debate.”

These ideas have continued to the present day, albeit in new forms. Women have the vote, but as the testimony of the #MeToo victims makes clear, there is a psychological level that still underwrites inequality. Men assume that their masculinity is about the assertion of power (in politics, at work, in relationships), while women have internalized the sense that they can exercise only diminished agency, that their femininity is defined by their passivity. If second wave feminism sought to change that outlook, it seems not to have entirely succeeded.

That is because in our culture masculinity is synonymous at least symbolically with power; femininity with its lack. The source of that symbolic association is an old one—the body and the office of the king were one; his masculinity was at once assured and confirmed by his possession of the phallus (the symbol of power). The advent of democracy dispersed political power, creating great uncertainty about who could claim legitimacy. Men claimed it on the basis of the association of their masculinity with the king’s. In their thinking the phallus and the penis became one—a male body (however socially, economically, or politically deprived of real agency) became the sign of a certain power—power signified by the domination of women. Indeed, in some cases—as described in the *New York Times* by Shanita Hubbard, an aggressive masculinity compensates for social and economic deprivation.

The so-called natural differences between women and men (those declared immutable by scientists and social scientists in the nineteenth century and that are once again being insisted upon by evolutionary psychologists) underwrite this kind of thinking. So it was that the Scottish biologist Patrick Geddes opposed giving women the vote on the grounds of their physical difference: “The hungry, active cell becomes flagellate sperm, while the quiescent well-fed one becomes an ovum.” It followed that women belonged in the private, domestic sphere, men in the public/political realm. “What was decided among the primitive protozoa,” he concluded, “can not be annulled by an act of parliament.” According to this logic, if the differences are natural, then the inequalities that follow from them cannot be rectified; indeed they are not inequalities at all.

The arguments have changed since the nineteenth century and today sexual emancipation is often heralded as a sign of equality. But, as the unfolding revelations have shown us, this is not at all the case. The myth of women’s sexual liberation is denied by the demeaning treatment they receive in the workplace, but also in sexual encounters (as reports from college campuses demonstrate). There seems to be a persistent belief—deeply rooted in our psyches—that men achieve recognition of their masculinity, and so of their political and social power, by exercising domination over women.

If we are to seriously address the current crisis beyond identifying and punishing individual men as bad actors, we have to attend to this history and make apparent how deeply rooted it is in our culture and our psyches. Without that critical intervention—without attention to what might be called “the lessons of history”—the flurry of revelations about longstanding and long tolerated exercises of men’s power, however horrifying in their details, will not suffice to achieve what is required to permanently change the gendered power dynamics of our culture. ■

This article by Joan Wallach Scott, Professor Emerita in the School of Social Science, was first published by the History News Network. Scott joined the Institute Faculty in 1985, and has challenged the foundations of conventional historical practice, including the nature of historical evidence and historical experience and the role of narrative in the writing of history, from gender and questions of difference to underlying ideological systems. Her most recent book is Sex and Secularism (Princeton University Press, 2017).

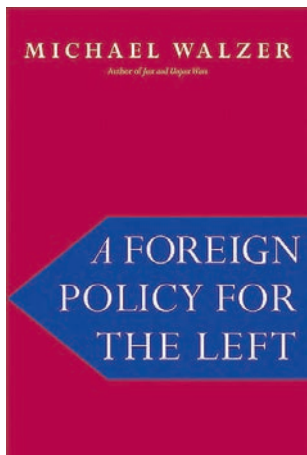


The #MeToo movement, which was founded in 2006 and proliferated in recent months due to a viral hashtag, galvanized survivors of sexual assault and harassment and brought conversations about the prevalence of sexual violence to the fore.

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A Foreign Policy for the Left, The Expanding Blaze, Sex and Secularism

Domestic society, pursuit of happiness, and the triumph of the Enlightenment over religion



The men and women of the left—socialists, social-democrats, and left-leaning liberals, all of us—are most at home in the homeland; our politics is focused on the character of domestic society. Though we claim to be internationalists—and we are, some of the time—we have never gotten a good grip on foreign policy or on security policy. This is, I want to argue, a highly principled failure. We do best with global issues when they are most like domestic issues, as when we oppose inequality, sweated labor, and anti-union practices abroad or work across borders against environmental degradation. Our record is not so good when the issue is the possible use of force. That is something most of us don't want to think about—or we just want to say no. Bernie Sanders's

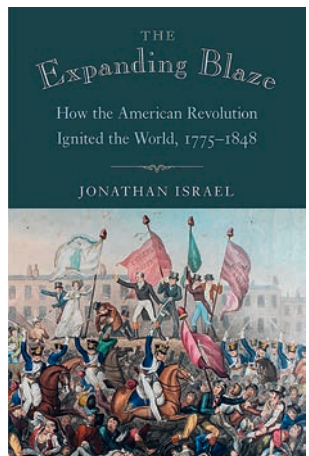
Democratic primary campaign of 2016 provides a near-perfect illustration of this position, though not the only one.

Like it or not, however, we live together with our fellow citizens in an anarchic society of states where the ability to make wise decisions about the use of force is essential to the safety of our own state, of states with which we have close relations, and sometimes of people far away who are in desperate trouble and need our help. Wise decision-makers opt for peace whenever they can, but sometimes for a cold war, sometimes for the use of force short of war, sometimes for the threat of war, and sometimes for the agony of war itself. Political wisdom isn't essentially militarist or pacifist (or anything in between). It requires a steady commitment to conciliation and compromise so long as these are possible, and a readiness to fight when fighting is necessary. The two are equally required. That combination has always been a problem for the left. . . .

There is a lot to be said for the default position. We should work in the place we know best to make things better. The improvement of humanity begins at home. This argument has special force for Americans, who live in an increasingly unequal society that is also a near-hegemonic world power. We need to be wary of adventures abroad that make our work at home more difficult.

Still, good leftists can't avoid internationalism. We will be engaged again and again in arguments about what we should do or what we should urge the United States to do to help people in trouble or comrades abroad. Sometimes there is nothing that the United States can do, at least nothing it is likely to do right. But even when we oppose American action in other countries, we can be active ourselves—providing moral, political, and financial support to men and women fighting in self-defense or in defense of others. There is no magic answer to the question, What should we do? But the ideological shortcuts I've just described, lazily adopted and rigidly held, have served us badly in the past and are almost certain to serve us badly in the future. Sticking with them means that we will get things right only by accident.

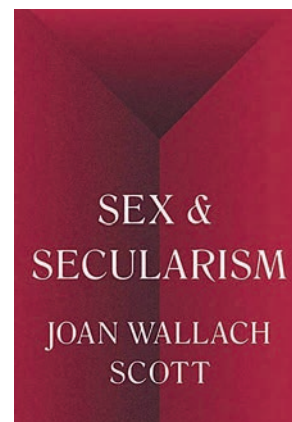
Political intelligence and moral sensitivity work much better than ideology, and they are what should guide our choice of comrades and our decisions about when and how to act abroad. Dictators and terrorists are never our comrades. We should embrace only those men and women who really believe in and practice democracy and equality. We should act abroad only with those who share our commitments and then, only in ways consistent with those commitments. This is the politics that I want to call left internationalism. —Michael Walzer, *Professor Emeritus in the School of Social Science*, in *A Foreign Policy for the Left* (Yale University Press, 2018)



The American Revolution created a new form of republic explicitly built on the principle of "liberty." Yet the United States that emerged in 1787 was predominantly undemocratic and by and large not geared to promoting the welfare of society as a whole. The Revolution contained two divergent tendencies within it, rooted respectively in moderate and radical Enlightenment, and this inevitably generated a conflict of attitudes, values, and institutions that could not easily be resolved. On the one hand there was the powerful Lockean legacy. But Locke had justified a revolution, the Glorious Revolution of 1688, led by an aristocracy on the basis of everyone's right to the pursuit of "life, liberty and property," assigning property a decisive role in the possession and organization of power and author-

ity. For Locke, the prime reason men enter into commonwealths placing themselves under government is for the "preservation of their property." Substituting the "pursuit of happiness" for "property" in the Declaration of Independence consequently had far-reaching implications regarding the purposes of the state and the scope of its responsibilities. Where in Locke property is the basis of social division into classes, Jefferson's

formulation marginalized the principle of social class. The landless could no longer be regarded as either so marginal or so subordinate as in Locke. Where Locke nurtured a negative conception of liberty, centered on protection of property, for Jeffersonians liberty was a positive, developmental concept to be upheld and advanced by the state and its agencies. Where in Locke, education is essentially a private matter geared to issues of property without any public role, in radical Enlightenment education is a public matter and something to which everyone has a right. Whereas in Locke, popular sovereignty extends only so far as the "compact" between people and the executive power, in the political philosophy of Franklin, Jefferson, Paine, and Price, the people share continuously in the exercise of government through elections, representation, and the right to free expression of opinion. In the constitution for the colony of Carolina that Locke drew up for the Lords proprietors of Carolina in 1669, and helped revise in 1682, for example, he took care to avoid erecting a "numerous democracy," slavery was retained, the Indians had few rights, and most colonists were left firmly subordinate to the great landowners, or "landgraves" as Locke termed them. Finally, Locke's toleration ruled out secularism, excluding atheists from toleration by the state and placing Catholics and Jews in a subordinate position in relation to the theologically tinted responsibilities of the sovereign. —Jonathan Israel, *Professor Emeritus in School of Historical Studies*, in *The Expanding Blaze: How the American Revolution Ignited the World, 1775–1848* (Princeton University Press, 2017)



Attention to secularism has again entered popular discourse as part of the "clash of civilizations" rhetoric. Of course, there is a long history of academic study of secularization, the processes by which European states are said to have brought organized religion under their control, introduced bureaucratic management and technical calculation into their governing operations, and justified their sovereignty in terms of republican or democratic theory, that is, as representatives of the mandate of those considered citizens, not as the embodiment of God's will. Secularism has been taken to be synonymous with these processes; the historical triumph of enlightenment over religion. But in its recent usage, it has had a simpler referent as the

positive alternative, not to all religion but to Islam. In this discourse secularism guarantees freedom and gender equality while Islam in synonymous with oppression.

Although some critics of Islam specify their target as political and/or fundamentalist Islam, most indict all of Islam in their condemnations. Thus, the idea of a "clash of civilizations," as articulated by the political scientist Samuel Huntington in 1993, posed Western Christianity against Islam in a conflict that, he maintained, "had been going on for 1300 years." In the article, he soon referred to Western Christianity simply as "the West," and although secularism was not denoted as such, it was implicit in the contrasts that he offered between freedom and oppression. As the phrase "clash of civilizations" gained prominence, especially after 9/11, secularism and gender equality became increasingly emphasized as the basis for Western superiority to all of Islam. So in 2003, the head of the French commission recommending a ban on Islamic headscarves in public schools explained that according to the principle of laïcité (the French word for secularism), "France cannot allow Muslims to undermine its core values, which include a strict separation of religion and state, equality between the sexes, and freedom for all." In the same year, the American political scientists Ronald Inglehart and Pippa Norris argued that "the true clash of civilizations" was about "gender and equality and sexual liberalization." The religious demands of Islam were said to deny both. Since then, the emancipatory effect of secularism on women had been so taken for granted that the American novelist Joyce Carol Oates expressed surprise at the criticism she got for tweeting that "the predominant religion of Egypt" was responsible for violence against women during the summer protests of 2013. It seems never to have occurred to her that misogyny of the kind responsible for the domestic violence that she often chronicles in her novels might be at issue, and that her comment be construed as Islamophobic, so self-evident did her opinion seem to her. Perhaps the most virulent attack on Islam in the name of secularism comes from a defiant French organization called Riposte Laïque ("Secular Retort"), which brings together groups from across the political spectrum to defend the republic from impending annihilation by the Muslim hordes. "When one is attached to the Republic, to democracy, to women's rights, to freedom, to secularism, one has the obligation to be islamophobic simply because Islam cannot tolerate emancipatory values." Here, by definition, secularism is associated with reason, freedom, and women's rights, Islam with a culture of oppression and terror. In this formulation culture is reason's other—reason assures the progress of history while culture protects immutable tradition. —Joan Wallach Scott, *Professor Emerita in the School of Social Science*, in *Sex and Secularism* (Princeton University Press, 2017)

How and Why Do We Write the History of the Social Sciences?

A historical excavation of meaning allows a better grasp of buried significations and connotations

BY GEORGE STEINMETZ

Why should we write the history and sociology of the social sciences? Some have suggested that putting science under the sociological microscope is self-indulgent and dangerously relativist. Others murmur that only those who can't do science study science. Ernst Wilhelm Eschmann, a Nazi sociologist, wrote in 1934 that a science that makes itself into its object of study, that studies "its relations and boundaries with other sciences, its epistemology, methods, and history," represents "the symptom of a profound sickness of an entire culture," a "pathology of scientificity."¹

Few nowadays would be inclined to agree with a Nazi scientist. Yet these criticisms should not go unanswered, especially in an age when scholars are insistently called upon to demonstrate the usefulness of their work. The historical sociology of social science is useful. It is a necessary part of all social science. Before outlining the usefulness of this apparently useless form of knowledge, and sketching some of the methods currently being used to carry it out, I will briefly sketch its emergence.

The social study of knowledge and science did, as Eschmann's comments suggest, emerge during a period of profound sociopolitical and cultural crisis in the first decades of the twentieth century. This period saw the stunning collapse of empires after World War I, the German economy's plunge into hyperinflation, the hydra-like rise of fascist movements in Europe, and the first signs of organized resistance to colonial domination in Africa and Asia. There was also a widespread "devalorization of objective and rational life which ... declares science to be bankrupt," as Gaston Bachelard observed in 1938.² The skepticism about science was an international movement, but it was stronger in Europe than the United States and especially powerful in Germany and the late Austro-Hungarian Empire. The precedents here included Karl Marx's critique of political economy as an expression of capitalist class interests and his more general argument that social existence determines consciousness. Nietzsche described scientific ideas as instruments of a will to power. Social class, political power, and religion were central explanatory factors in the nascent sociology of knowledge. Discussions among participants in the Budapest "Sunday Circle," who included György Lukács and Karl Mannheim, circled around the idea of the dependence of knowledge upon social position.³ A number of social scientists and historians in Weimar Germany (Ernst Grünwald, Karl Mannheim, Max Scheler, and Alfred Weber) developed the approach that came to be known as the sociology of knowledge.⁴

A key development in this intellectual movement was the turn to analyzing the physical and natural sciences sociologically. The idea of explaining science sociologically had also emerged before World War I. In *Elementary Forms of the Religious Life* (1912), Émile Durkheim traced the basic epistemological categories of thought, and modern science, including time, space, number, cause, and force, to religious social practices and structures. George Sarton created the journal *Isis*, dedicated to the history of science, in 1913; this was followed by *Osiris* (1936) and *Journal of the History of Ideas* (1940). But the history of science was not "established in academic departments, centers, and programs in Europe and North America" until the 1950s and 1960s. The early historians of science were less oriented toward explaining science sociologically than to celebrating its inexorable march toward perfection and linking it to "something called 'the modern mentality,'" whose home was in the West.⁵ Some of these founding narratives of the history of science were also ambivalent about the destructive aspects of

scientific modernity, as Lorraine Daston points out, but this did not lead their authors to a full-fledged sociological account of scientific change until the 1960s.

This story of the rise of a more explicitly theorized history of science sometimes overlooks a more eclectic set of thinkers who began to develop sociological approaches to the history of science between the wars. The journal *Science and Society*, created in 1936, was "dedicated to the growth of Marxian scholarship" and announced a special interest in work that "illuminates the interdependence of science and society."⁶ One contributor was Dutch mathematician Dirk J. Struik,

who analyzed the "sociological stain" said to shape the development of even the purest forms of mathematics.⁷ In a series of articles published in the Austrian socialist journal *Der Kampf*, philosopher Edgar Zilsel analyzed the social roots of scientific causal thinking and the concepts of scientific progress and physical laws in religion, legal forms, state politics, and class relations.⁸ Philosopher Gaston Bachelard analyzed epistemic obstacles to scientific knowledge rooted in unconscious emotions, some of them linked to scientists' anxieties about social status.⁹ American sociologist Robert K. Merton redeployed Max Weber's Protestant Ethic thesis by explaining the rise of science in seventeenth-century England partly in terms of Puritanism.¹⁰

The cultural revolutions of the 1960s gave new impetus to the history and sociology of science.

A signal event was Thomas Kuhn's *The Structure of Scientific Revolutions* (1962). New journals were created: *Archive for History of Exact Sciences* (1960), *Minerva* (1962), *British Journal for the History of Science* (1962), and *Journal of the History of the Behavioral Sciences* (1965). *Cheiron*, the International Society for the History of Behavioral and Social Sciences, was founded in 1968.

This history still does not explain why anyone should be interested in studying the history or sociology of social sciences. There are two sorts of justifications: some intra-scientific, and others of more general interest.

First, the historical sociology of social science helps social scientists understand their own quasi-spontaneous orientation toward specific theories, concepts, and methods. This form of "self-reflexivity" should not be imagined along the lines of a confessional; it is better described as a practice of *self-objectification*, in Pierre Bourdieu's words. A historical excavation of meaning allows us to better grasp the buried significations and connotations of our current scientific language, which is often the result of earlier scientific battles.

One example of the hidden sources of present-day conceptual language is the phrase *social science*. Different actors and institutions have preferred different *genus* labels. In battles over the scientific direction of UNESCO starting in 1946, Americans argued in favor of the label *social science*, which at the time suggested applied, mainly quantitative social research, organized around the individual person as the fundamental unit of analysis. French scholars pushed for UNESCO to adopt the label *human sciences* (*sciences humaines*), which for them encompassed philosophy and the humanities.¹¹ Back in the United States at the same time, however, the phrase *behavioral sciences* was being used for the Ford Foundation's program to fund the disciplines that had hitherto been known as *social sciences*. This was intended to avoid any confusion of social science with socialism and to emphasize the same set of approaches associated with "social science" at

(Continued on page 13)



Psychological tests conducted by French researchers on colonial Algeria's Mekhadma tribe during the 1950s took place under the aegis of French occupying troops and under the gaze of the colonized but semi-autonomous Caïd (depicted above), while colonial studies conducted in other contexts were free from such an authoritative presence.

1 Ernst Wilhelm Eschmann, "Die Stunde der Soziologie," *Die Tat* 25:12 (1934), 953–966, 955.

2 Gaston Bachelard, *The Formation of the Scientific Mind* (Manchester: Clinamen, 2002), 186.

3 Éva Karádi und Erzsébet Vezér, eds., *Georg Lukács, Karl Mannheim und der Sonntagskreis* (Frankfurt am Main: Sandler, 1985).

4 Werner Stark, *The Sociology of Knowledge* (Glencoe, Ill.: The Free Press, 1958).

5 Lorraine Daston, "The History of Science and the History of Knowledge," *Know: A Journal on the Formation of Knowledge* 1:1 (2017), 131–154, 133–135.

6 "Science and Society: A Marxian Quarterly," *Science and Society* 1:1 (1936), 1.

7 D.J. Struik, "On the Sociology of Mathematics," *Science and Society* 6:1 (1942), 58–70, 64.

8 Edgar Zilsel, *The Social Origins of Modern Science* (Boston: Kluwer Academic Publishers, 2000).

9 Bachelard, *Formation*, 54.

10 Robert K. Merton, "Science, Technology and Society in Seventeenth Century England," *Osiris* 4 (1938), 360–632.

11 Peter Lengyel, *International Social Science: The Unesco Experience* (New Brunswick: Transaction, 1986).

UNESCO. In Germany, the central debate pitted the traditional idea of *Geisteswissenschaften* against social science, which was usually rendered as *Sozialwissenschaft*. The new universities created after 1918 in Germany were the first to have “social science” divisions. The reassignment of sociology from the *Geisteswissenschaften* to the social sciences was largely completed between 1933 and 1945 due to the Nazis’ preferential support for applied research.¹² Research on social science can make these sorts of histories part of the self-objectifying practice of social scientists.

A second justification for this form of research is that many excellent social theories and concepts have been collectively forgotten and can be recovered and reintroduced. Serious research on Marx or using Marx’s ideas was largely excluded from professional social science in the United States and Germany before the 1960s.¹³ Durkheim and Weber were widely dismissed as outmoded compared to American-style social science in France and Germany, respectively, after 1945. Zilsel was largely ignored, like most of the refugee sociologists from Nazi Germany, but his work has now been recovered.

A third justification for the history of social science is provided by sociologist Lothar Peter.¹⁴ Modern phenomena such as individualization, secularization, and capitalism may become more invisible as they become more universal, entering common sense and the taken-for-granted. Earlier observers who had a foot in two different social worlds and worldviews may have been able to perceive these nascent social processes more clearly than we are today.

The fourth justification for the history of social sciences is that it can help us understand the conditions in which social science flourishes or stagnates.¹⁵

Finally, the history of social science contributes to explaining (and thereby, perhaps, solving) various social problems. The social sciences permeate our social existence. They influence the configuration of our economies, social policies, educational systems, and foreign affairs. Here it is important to distinguish between the intentional application of social science to policy and the unintentional impact of social science on social practices.

Areas in which social science has been deliberately used to guide policy include eugenics and social insurance, labor market policies and poverty relief programs, and most recently, schemes intended to “nudge” individuals toward desired behaviors.¹⁶ One exceptionally well-documented instance of social science being directed toward government policy is modernization theory, which emerged in response to Harry Truman’s program for the development of previously colonial areas. Sociological ideas informed guided projects of community development, land reform, dam building, and the agrarian “Green Revolution.”¹⁷ Similar interventions were undertaken with social scientific guidance throughout the French and British African colonies during the postwar period under the guise of colonial development.¹⁸

Counterinsurgency campaigns have also commissioned social scientific research. During the Algerian Civil War, social scientists helped to design and run the resettlement camps created to undercut the uprising. The entire process was overseen by the Specialized Administrative Sections of the French Army, some of whose officers studied “Muslim sociology” and some of whom were charged with studying indigenous villagers before and after resettlement in order to discover how to make the camps more viable.¹⁹ A number of these officials were trained by the former colonial military officer and Durkheimian sociologist Robert Montagne at the Parisian *Centre des hautes études d’administration musulmane* (Center for Advanced Study of the Administration of Muslims).

Closer to home, the U.S. Defense Department has funded numerous social science projects since World War II. Efforts have been made to guide foreign policy using game theoretic models and computational systems, such as the Crisis Early Warning and Monitoring System.²⁰ Among the best-documented Pentagon-funded counterinsurgency research initiatives are the Troy (1950s), Camelot (1960s), and Human Terrain System (2007–2014) projects and the

current Minerva Initiative (2008–present).

Social science also shapes policies and practices in many indirect ways. I tried to uncover such hidden causal chains in *The Devil’s Handwriting*, which set out to explain why the German colonial government in Southwest Africa (Namibia) carried out genocide against the Herero people in 1904, while German colonizers pursued more paternalistic and peaceful policies in other parts of their overseas empire. That book shows that the ethnographic and civilizational accounts of European travelers, missionaries, and amateur ethnographers set the basic parameters of formal colonial policies, even if this was not the conscious intent of those accounts and even if these cultural descriptions were generated years, even decades before colonial conquest.

This finding is not a recipe for preventing genocide. The social sciences are not good at prediction, except with regard to more trivial, repeated events—and even then this is only true within specific time-space constraints. Epochal historical events like revolutions, massacres, and the collapse of states and empires are overdetermined within open systems. While such events can be explained, the idea of lawlike historical generalization is chimeric. What a historical study like this can do is point to conditions that were causally efficacious in one instance of genocide, suggesting that they may be a necessary if not a sufficient condition, and thereby cautioning against them in the present. In the example of the Herero genocide, these causal conditions had to be identified using the methods of the history of social science.

But what are these methods? How exactly should we investigate the social sciences? Let me just mention three important aspects of this methodological discussion: (1) the need to connect *texts* and *contexts*, (2) the importance of using *private* and *public* documentation, and (3) deployment of the concept of semi-autonomous social fields.

With regard to the first point: it has become clear that researchers in this area have to attend to the textual, visual, and numerical *works*—using all of the appropriate methods of interpretation and analysis—as well as the *contexts* of the production of social scientific works. Relevant contexts range from the most proximate (the scientist’s biography or collective prosopography), to the intermediate (scientific institutions, disciplines, and fields), and to the more remote contexts that were the focus of the earliest contextual research discussed above.

An example of the importance of taking into account the recursive relations between social science and its context is suggested by the work of French psychologists from the *Centre d’Etudes et d’Informations des problèmes humains dans les zones arides*, who carried out psychological tests on the Mekhadma tribe in colonial Algeria during the 1950s. The photo on the opposite page reveals that the testing was carried out under the aegis of the colonial military and the surveillance of the Caïd, the semi-autonomous headman on horseback. Other colonial-era researchers had more autonomy from colonial officials and indigenous actors.²¹

Second, it is essential to combine published materials with institutional documents and personal papers, including private correspondence. By establishing political and institutional constraints and private communications and comparing them with published work we can shed light on the question of how scholars deal with pressures from states, funders, employers, and colleagues.²²

Finally, research in the historical sociology of science has benefited from Pierre Bourdieu’s field theory, which gives conceptual clarity to a crucial intermediate social level located between the micro-level of biography and the macro-level of society.²³ Bourdieu’s field model has helped us understand such phenomena as the failure of some émigré social scientists to transfer their scientific capital from their earlier context to a new one, and the converse. It sheds light on the changing meanings of a given intellectual program as it travels internationally from one context to another. It explains other things: the internal conflicts and power structures within disciplines; the gatekeepers, export-import controls, and protectionisms at disciplinary borders; and the stubborn resistance of some disciplines or parts of disciplines to trends in adjacent fields, as well as the seemingly spontaneous openness of other actors to inter- or transdisciplinary interactions. The field approach explains the overall obsession with ranking and ordinalization in contemporary education, research, and (social) science. At the cutting edge of current discussions of field theory are efforts to introduce spatial analysis into the study of fields and to combine it with a more nuanced model of the human subject. ■

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12 Carsten Klingemann, “Social-Scientific Experts—No Ideologues. Sociology and Social Research in the Third Reich,” in *Sociology Responds to Fascism*, S. P. Turner and D. Käsler, eds. (London: Sage, 1992), 127–154.

13 See note 6.

14 Lothar Peter, “Warum und wie betreibt man Soziologiegeschichte?,” *Jahrbuch für Soziologiegeschichte* 1997/1998 (2001), 9–64.

15 George Steinmetz, “Field Theory and Interdisciplinary: Relations between History and Sociology in Germany and France during the Twentieth Century,” *Comparative Studies in Society and History* 59:2 (2017), 477–514.

16 George Steinmetz, *Regulating the Social: The Welfare State and Local Politics in Imperial Germany* (Princeton: Princeton University Press, 1993); Daniel Breslau, *In Search of the Unequivocal: The Political Economy of Measurement in U.S. Labor Market Policy* (Westport, Conn.: Praeger, 1998).

17 Wolfgang Knöbl, *Spielräume der Modernisierung: das Ende der Eindeutigkeit* (Weilerswist/Velbrück Wissenschaft, 2001).

18 George Steinmetz, “Sociology and Colonialism in the British and French Empires, 1940s–1960s,” *Journal of Modern History* 89:3 (2017), 601–648.

19 Grégor Mathias, *Les sections administratives spécialisées en Algérie: entre idéal et réalité (1955–1962)* (Paris: L’Harmattan, 1998), 37.

20 Joy Rohde, “Pax Technologica: Computers, International Affairs, and Human Reason in the Cold War,” *Isis* 108:4 (2017), 792–813.

21 Steinmetz, “Sociology and Colonialism.”

22 For an example, see George Steinmetz, “Neo-Bourdieuian Theory and the Question of Scientific Autonomy: German Sociologists and Empire, 1890s–1940s,” *Political Power and Social Theory* 20 (2009), 71–131.

23 E.g., Pierre Bourdieu, *Science of Science and Reflexivity* (Chicago: University of Chicago Press, 2004).

Red Hangover: Legacies of Twentieth-Century Communism

Exploring the human costs of regime change twenty-five years after the fall of the Berlin Wall

BY KRISTEN ROGHEH GHODSEE

Two pairs of earrings, four bracelets, and a mixtape inspired me to write this book. I was in the Stadtmuseum in the German city of Jena, peering into the various display cases of an exhibit called *Freundschaft! Mythos und Realität im Alltag der DDR* (*Friendship! Myth and reality in everyday life in the GDR* [German Democratic Republic]). The exhibit ruminated on the official and unofficial uses of the word “friendship” in the context of communist East Germany between 1949 and 1989. In one case, the museum’s curators displayed the personal items of a teenage girl who had gone to a Free German Youth summer camp in 1985. There, accompanying some photos and a letter she sent home to her parents, sat a white cassette tape, some plastic bracelets, and two pairs of oversized, cheap earrings, the kind once fashionable in the mid-1980s when every girl’s hair was two stories too high.

Back in 1985, I spent several weeks of my summer at a camp in the Cuyamaca Mountains one hour east of San Diego. When I left home, I remember packing several pairs of the same horrible earrings, some plastic bangles, and a stack of mixtapes with my favorite songs recorded off the local Top 40 radio station. Standing in Jena thirty years later, I experienced one of those moments of radical empathy, and tried to imagine what my life would have been like if I’d gone to summer camp in communist East Germany rather than in capitalist California. This girl and I might have shared the same passion for similar material objects, but we would have been ideological enemies, surviving our adolescences on different sides of the Iron Curtain.

From the placard on the display case, I understood that this girl was born in 1971, one year after me. Somewhere out there, this girl was now a woman about my age, and I longed to talk to her, to ask her what she remembered about that summer of 1985, and how things had worked out for her. This German girl would have been eighteen when the Berlin Wall fell, and nineteen when her country ceased to exist. She would have just graduated from secondary school, and probably listened to Madonna and Fine Young Cannibals as I did: “Express Yourself,” “Like a Prayer,” and “She Drives Me Crazy.” But where I had the luxury of geopolitical continuity in my personal life, this East German faced a young adulthood of dramatic social and economic upheaval.

When I left the museum, I wandered through the cobblestone alleyways leading off the main market square. I saw posters for two upcoming demonstrations in Jena. The right-wing, anti-immigrant political party Alternative for Germany (AfD) would organize a rally and a march in the *Marktplatz* while Germany’s left-wing party, Die Linke (The Left), in a coalition with other centrist and leftist parties, would organize a counterdemonstration in front of the church. The counterprotesters had plastered the small city with posters saying “FCK AFD” and “refugees welcome,” and I guessed that the center/left demonstrators would outnumber their right-wing counterparts.

But after the November 2015 terrorist attacks in Paris, and the spate of sexual assaults on women in Cologne on New Year’s Eve, many Germans feared for their future. The political appeal of the far right increased across the country, but particularly in the former states of the now-defunct Deutsche Demokratische Republik. In the eastern city of Dresden, “concerned citizens” formed a group called PEGIDA, which stood for Patriotische Europäer gegen die Islamisierung des Abendlandes (Patriotic Europeans against the Islamicization of the Occident).¹ Many ordinary men and women frustrated with their governments’ open-door asylum policies supported PEGIDA. On January 11, 2016, as LEGIDA (the Leipzig branch of PEGIDA) celebrated its one-year anniversary, about two hundred masked neo-Nazis marched through the immigrant-friendly neighborhood of Connewitz, smashing cars and windows with axes and baseball bats.² One month later, in the sleepy village of Clausnitz, a few kilometers from the Czech border, an angry mob of Germans tried to prevent a bus full of refugees from reaching a shelter.³ Men and women in the crowd shouted “Wir sind das Volk!” (We are the people), a slogan used by anticommunist protestors in 1989. Twenty-five years ago, this chant reminded the leaders of the GDR that democracy meant rule by the people. Two days after the incident in Clausnitz, a hotel destined to house Muslim refugees caught fire in the Saxon town of Bautzen.⁴ Onlookers cheered as the roof burned. Federal politicians condemned the growth of right-wing xenophobia in the former states of the GDR as ever more eastern Germans felt their voices ignored. As I walked through the streets of Jena back to my university apartment, I wondered about that girl in the museum and the woman she had become. If she still lived in town, which rally would she be attending? With which side would she sympathize, and why?

The year 2017 marks the one hundredth anniversary of the Russian Revolution and the creation of the world’s first socialist state. Much of the twentieth century was defined by the presence of this Soviet superpower and its challenge to the

political economy of greed and exploitation that underpinned the capitalist system. Built on ideals of self-determinism and social egalitarianism, the Soviet Union became a symbolic beacon of hope not only to people struggling against European imperialism and continued colonial domination, but also to Western workers locked in labor conflicts with avaricious employers. Even after the cruel brutalities of Stalinism and the economic deficiencies of “really existing socialism”⁵ became clear, leftists continued to imagine alternative pathways to pure communism, the supposed highest stage of human history. When Eastern Bloc communism collapsed between 1989 and 1991, the whole project seemed consigned to the dustbin of history. The entire decade of the 1990s was one big ideological gloat-fest for the Cold War’s winners. Ding dong, the Reds are dead.

The end of the Cold War created an unprecedented opportunity to create a more stable, peaceful, and equitable world, for the Western countries to show moral strength and help rebuild the economies of the former Eastern Bloc in the way they once assisted the West Germans and the Japanese after World War II. Instead, the ideological war against communism continued as if the Cold War had never ended. The communist ideal became straitjacketed to the horrors of Stalinism for at least half a century. Of course, none of the twentieth-century experiments with the communist ideal ever came close to achieving communism in the Marxist sense, a future moment when the state would wither away. To be technically correct, the countries of Eastern Europe should be called state socialist countries, in the sense that the national-

ized means of production were always controlled by a centralized state serving as a dictatorship of the proletariat. For Karl Marx, this was only a stage on the way to true communism, a necessary stepping-stone to a brighter future. But because they justified their actions in terms of the communist ideal, and because scholars and politicians in the West always referred to these countries as “communist,” I use the terms “communist” and “socialist” interchangeably throughout the book.

Since the late 1990s, I’ve been doing research and writing books about the experiences of ordinary people who lived through the end of the Cold War in Eastern Europe. My work endeavored to capture a recent past, one that would soon fade and be forgotten. But that day in Jena, I felt the past alive in the present and understood that the legacies of the fall of communism infused current European political realities. Why else would East Germans in 2016 resurrect a protest slogan from 1989? Indeed, once I started thinking about it, all of the major crises of the previous year—the Greek debt crisis, the Russian annexation of Crimea, the Syrian civil war, the rise of the Islamic State in Iraq, and the massive increase in migration to Europe—could be linked back to mistakes made after the collapse of the Eastern Bloc when fantasies about the world-historic triumph of free markets and liberal democracy blinded Western leaders to the human costs of regime change. If the communist ideal had become tainted by its association with twentieth-century Eastern European regimes, today the democratic ideal has been increasingly sullied by its links to neoliberal capitalism. How much violence and human misery has been justified in the name of promoting democracy? ■

This article is an excerpt from *Red Hangover: Legacies of Twentieth-Century Communism* (Duke University Press, 2017) by Kristen Ghodsee, President of the Association of Members of the Institute for Advanced Study and Member (2006–07) in the School of Social Science. Ghodsee is Professor of Russian and East European Studies at the University of Pennsylvania and the author of seven books, including *The Left Side of History: World War II and the Unfulfilled Promise of Communism in Eastern Europe* and *Lost in Transition: Ethnographies of Everyday Life after Communism*.

1 “Concerned citizens” in the description for PEGIDA supporters used by Dresden’s mayor in a 2016 interview: Hildegard Michel-Hamm, “Xenophobia in Germany: Interview,” *Deutsche Welle*, February 2, 2016, <http://dw.com/p/113f7>.

2 Maximilian Gerl, “Neonazi-Krawalle in Leipzig: Verwüstet,” *Der Spiegel*, January 12, 2016, www.spiegel.de/politik/deutschland/leipzig-connewitz-viele-scherben-viele-fragen-a-1071665.html. *Russia Today* also covered the event and posted videos of the violence: “Over 100 Arrested, Shops Vandalized in Leipzig amid LEGIDA Birthday Demonstrations,” *Russia Today*, January 12, 2016, www.rt.com/news/328586-legida-anti-migrant-demonstration-rampage.

3 Christoph Titz, “Busattacke in Clausnitz: Ein Dorf wundert sich,” *Der Spiegel*, February 21, 2016, www.spiegel.de/politik/deutschland/clausnitz-und-die-attacke-auf-fluechtlinge-jetzt-will-es-keiner-gewesen-sein-a-1078492.html. Video of the event can be seen here: “‘Shameful’ Video of Mob Blocking a Refugee Bus in Germany Sparks Outrage,” *Deutsche Welle*, February 19, 2016, www.dw.com/en/shameful-video-of-mob-blocking-a-refugee-bus-in-germany-sparks-outrage/a-19062019. Tobias Dorfer, “Nach Clausnitz und Bautzen: Auf die Straße!” *Zeit Online*, February 28, 2016, www.zeit.de/gesellschaft/zeitgeschehen/2016-02/clausnitz-bautzen-reaktionen-engagement.

4 Dirk Pilz, “Rechte Gewalt Kein schlimmer Land als Sachsen,” *Berliner Zeitung*, February 28, 2016, www.berliner-zeitung.de/politik/rechte-gewalt-kein-schlimmer-land-als-sachsen-23636326.

5 “Really existing socialism” or “actually existing socialism” was a term embraced during the Brezhnev era to refer to the realities of Soviet-style central planning as opposed to Marxist ideals of socialism as a step on the way to pure communism.



“No Volk, No ‘Fatherland,’ No Führer.”

Leonardo's Watery Chaos

How an intellectual show and tell revealed stunning parallels among Leonardo's studies of water and hydrodynamics

BY IRVING LAVIN

In order to explain my idea it seems appropriate to tell you how my interest in the subject came about. Shortly after I came to Princeton in the fall of 1974 I was invited to join a small group of people from a variety of fields in giving some account of what was new—recent developments and promising directions for future research—in our respective disciplines. Nothing ever came of the publication project the organizer of the meeting envisaged, but I was left scarred forever by the presentation of one of the participants in that little game of intellectual show and tell, the late Arthur Wightman, Professor of Mathematical Physics at Princeton University. Wightman spoke about the new and interesting studies of what he called catastrophe theory—that was the first time I had heard the phrase. In order to explain the subject to the laymen amongst us he gave the example of an object, like a stick placed in a stream of flowing water whose velocity is gradually increasing. The pattern of ripples caused by the obstacle develops and changes according to certain regular, mathematically definable rules, up to a certain point, literally an instant in time, after which the water becomes turbulent in the specific sense that it can no longer be described mathematically. The flow of water becomes unpredictable at the moment of what he called catastrophe. The problem of interest to the scientist was to try to push back (or forward) as far as possible the moment of catastrophe, reducing to a minimum the limit of predictability. The scientist then spoke of catastrophe, turbulence, and predictability—all of which I, as an art historian used to thinking in biblical and Christian eschatological terms, translated mentally into the term “chaos,” which, as far as I can recall, Professor Wightman did not then use.

His presentation struck me, as an art historian, like a bolt of lightning because it gave me a completely new sense—insight, I like to think—into what might be described as one of the major categories of the mind of Leonardo da Vinci. In fact, stunning parallels can be found among Leonardo's studies of water and hydrodynamics, not for just one or two points, but for practically every detail of Wightman's account. No less important than these details, however, was the light this realization in turn shed on another heretofore unposed, let alone unanswered question, namely, why was Leonardo so inordinately obsessed with water in the first place? Within the vast range and depth of Leonardo's perceptual and intellectual ken, recorded in innumerable drawings and verbal observations in his great legacy of notebooks and study sheets, it is abundantly clear that water preoccupied him much more than any of the many other subjects to which he turned his attention. The sheer volume of his studies of water, hundreds of drawings and notes, exceeds by far that of his work on any other single theme. Leonardo was truly enthralled, not to say obsessed by water—so much so that this fact in itself calls for explanation.

Many of his observations and theories, including some of his most spectacular and famous drawings, were of a practical nature. Some of his most fabulous and grandiose ideas were intended to achieve, sometimes quite unrealistically, concrete and useful results. He wanted to redirect the River Arno and introduce a system of canals. He planned great projects and invented ingenious devices putting water to work in a variety of ways. However, the great majority of water studies are not of this kind. They are not practical but theoretical studies of what we would now call the science of hydrodynamics. Professor Wightman's explanation of turbulence and catastrophe struck me like a bolt of lightning because it suggested a reason why Leonardo had such a passion for water and its movements.

As frequently happens with Leonardo, his observations are truly amazing. I once showed a group of the drawings to a hydraulic engineer here in Princeton who, having studied them for several weeks, was also astonished by them, reporting that Leonardo evidently saw with the naked eye, as it were, some actions of water that have been confirmed only in modern times with sophisticated methods of observation, measurement, and control.

What fascinates me in all this is the possibility that through his studies of wave motions and currents, and especially his preoccupation with the effects of moving water encountering obstacles, including water itself and the surrounding air, Leonardo may have done something more, or at least something other than

anticipate modern observations of hydrodynamic phenomena. Leonardo may have arrived not simply at an idea of turbulence and catastrophe as narrowly defined but at a concept of uncontrolled universal turbulence, akin to the ancient ideas of an original, primeval chaos. I suspect Leonardo had in mind something like a cognitive definition of reality, identifying rationality with the world we know and irrationality with the protogenic world we cannot know. It amounts to a kind of epistemological philosophy, or indeed an epistemological metaphysics, in which order and knowledge inhabit the world that exists, and in which disorder and ignorance came before and will come after.

The ideas of continuity and conservation taken together in turn underlie Leonardo's wonderful studies of vortices and whirlpools created in a widening channel when the swiftly moving water encounters the slower water ahead and compensates by turning back upon itself. To my mind, the coincidence of opposites embodied in these notions reflects a rational conception of the universe based on the assumption of an underlying symmetry in nature. Indeed, one might say that the almost Einsteinian ideas of a single force and an ultimate symmetry constitute the twin peaks of Leonardo's studies of water.

One of Leonardo's most moving apostrophes to the beauty of creation refers to this very combination of force and symmetry:

O, wonderful justice of you, the Prime Mover. You have chosen not to deprive any movement of the order, and quality of its necessary effects¹

The idea of the Prime Mover is ultimately derived from Aristotle, of course, except that here its nature is defined in terms of the complementarity of movement and its effect, that is, the symmetry of forces. In turn, the combined ideas of force and symmetry became the basis for distinguishing between being and non-being, rationality and chaos. To indicate the consistency, profundity, and completeness of Leonardo's thought, I shall quote another passage in which

he speaks of the Book of the Waters. To understand the statement fully, one must realize that throughout his life Leonardo pondered how to begin the work. There are many passages written at various stages in which he says that in the first book of the treatise on water we will speak of this or that point, and in one of the last of these observations, made at the end of his life, he proposes to begin the Book of the Waters as follows:

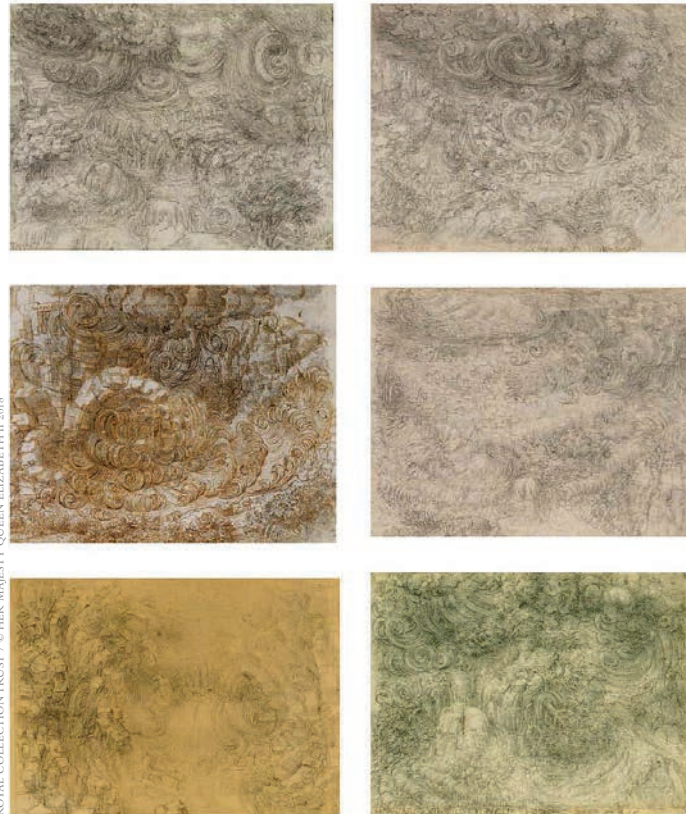
The first book of the waters.

Nothing shares a surface with something and something shares a surface with nothingness. And the surface of something is not part of that thing, whence it follows that the surface of nothingness is part of nothingness, whence it follows that a single surface is the limit between two things that are in contact. Since the surface of water is not part of the water, and hence is not part of the air or of other bodies placed between them, what is it then that divides the air from the water?²

Thus, at the end of his life, at the same time he was making the deluge drawings, he would have begun the treatise on water with a question, a question that arises from his perception of water as the junction between nothingness and existence. That question is the beginning and the end. ■

Irving Lavin, Professor Emeritus in the School of Historical Studies, is one of America's most distinguished art historians. He has written extensively on the history of art from late antiquity to modern times. His interests have focused primarily on the correlation between form and meaning in the visual arts. This is an edited excerpt of a full essay available at www.ias.edu/lavin-leonardo-water. The essay was first presented in Italian in a dialogue with the physicist Tullio Regge, former Professor in the School of Natural Sciences, as the fifth episode in a television series, “Dietro lo Specchio,” broadcast by RAI 2 in Turin, Italy, October 21, 1981.

- 1 O mirabile giustizia di te, primo motore! Tu non hai voluto mancare a nessuna potenza l'ordini e qualità de' suoi necessari effetti. Richter 1970, II, p. 285, No. 1134 (MS A, fol. 24r; Gombrich 1976, p. 45, fig. 93)
- 2 Primo libro delle acque. Il nulla ha superficie colla cosa e la cosa ha superficie col nulla; e la superficie della cosa non è parte d'essa cosa: seguita che la superficie del nulla non è parte di tal nulla, onde è necessario che una superficie sola sia termine comune di due cose che sieno in contatto: come la superficie dell'acqua non è parte d'acqua e per conseguenza non è parte dell'aria, nè altri corpi infra loro s'interpone. Che è quel ch'adunque che divide l'aria dall'acqua?...Brizio 1980, pp. 545f., Cod. Arundel (Brit. Mus. MS 263), fol. 159a/b (my translation).



Leonardo studied water practically without interruption from his youth until his death, constituting a coherent theme. The deluge drawings (above) are not the inchoate scribbles of a feverish imagination spinning out of control, but a detailed analysis and reflection on the theme of universal cataclysm.

Discipline and Creativity

Anti-conformity, questions of usefulness, and free thinking in military and industrial settings

BY BREGJE F. VAN EEKELEN

On April 6, 1960, Institute for Advanced Study Director Robert Oppenheimer received a letter from psychologist John E. Drevdahl, requesting his support in setting up a study among IAS Members to assess the factors that made them creative. Thus far, Miami University-based Drevdahl wrote, most studies were “based upon Air Force captains and industrial chemists,” noting understatedly that “I do not feel that [this]... resulted in the identification of those personality factors which are most characteristic of a truly creative and productive researcher.” While it is easy to relate to Drevdahl’s intuition that the military and industry were not the most suitable places to capture creative thinking, it was in those very places that creativity theories and techniques were flourishing in the United States at the time.

My research project on the social history of creativity shows that in the decade preceding the correspondence, processes to garner new ideas and techniques to think “beyond” existing bodies of knowledge became an object of professional interest in a contact zone of industry, the military, and academia. Various elements of the military were early sites for the introduction of creative ideation techniques. Imagine for instance a psychologist (Abraham Maslow no less) imploring military officers in 1957 to get in touch with their unconscious: “out of this unconscious, out of this deeper self, out of this portion of ourselves of which we generally are afraid and therefore try to keep under control, out of this comes the ability to play—to enjoy, to fantasy, to laugh, to loaf, to be spontaneous.” By 1964, at least 50,000 Air Force members had taken creative problem-solving courses. U.S. Steel, Reynolds Metals, Ethyl Corp, GE Motors, New York Telephone Company, and Boeing Airplane were some of the earliest industrial places where free-wheeling buzz sessions, brainstorming, and group thinks emerged.

The scientific study of creativity, as carried out by Drevdahl and numerous others at the time, can be regarded as a legitimating element in this professionalization process. The field of creativity studies drew on a motley set of practitioners from military and industrial settings, engineers, philosophers, anthropologists, and psychologists. Many of their research endeavors were generously supported by military funding. The Cold War provided a generative backdrop for much of the interest in creative ideation, as it highlighted numerous pressing situations that necessitated a move beyond existing knowledge. In military survival training, for instance, recruits were exposed to creative thinking techniques in an effort to retrain them to “think” for themselves in unforeseen situations. Atomic future studies required participants to think the unthinkable and thus to let go of “fixed thinking.” As befitted the Cold War atmosphere, Drevdahl’s creativity study was also framed as a matter of national security. “[T]he survival of this nation, and perhaps, even of Western civilization,” he argued, depended on future creators. His thesis was that the most creative people were “of only moderately superior intelligence” (which does beg the question why he was keen to study IAS Members). Rather than intelligence, he hypothesized, “personality” might be the deciding factor in creativity, and personality was amenable to change, in that it was “produced by a person’s environment.” If his hypothesis that creativity was a matter of nurture rather than nature was correct, the United States government could step in by fostering an educational and institutional ecosystem that would “create more creative people.”

Drevdahl’s study can be regarded as a piece of what came to be called the “Sputnik-inspired era of creativity.” It was supported by United States funding from the National Defense Education Act (NDEA), which had been initiated following the shock of Sputnik. With the model of a plastic population whose creative abilities could be cultivated, one of the NDEA-sponsored challenges was to detect creative citizens. And indeed, the field of creativity studies participated in the widespread testing of the U.S. population. Besides Air Force captains and industrial chemists—and often in addition to both—children were subjected to a variety of tests meant to capture their creative ability. In addition to standard intelligence tests, soldiers and children were subjected to Rorschach tests, symbol-equivalence tests, Thematic Apperception Tests, drawing completion tests, figure preference tests, anagram tests, and mosaic construction tests. These tests were meant to detect those creative individuals whose future knowledge

might contribute to national security. The Torrance Test for Creative Thinking was perhaps most successful in making creativity a measurable attribute, even as creativity’s operationalization—almost by definition—remained elusive.

While creativity was an object of scientific inquiry and a generative practice in military and industrial settings, it was at the same time pitted against predominant utilitarian rationalities. Creativity emerged precisely in those highly regimented settings in which thinking *inside* the box was institutionalized through military protocols or managerial rationalities. In these settings where knowledge-formation was under pressure, calls for anti-conformity, for the bracketing of the question of usefulness, and for non-hierarchical free thinking were made in an organized quest to overcome the limits of boxed-in thought. At its best, these calls for what I call “counter-knowledge”—knowledge that comes about by not following the existing rules of thought—were self-reflexive responses of managers and supervisors of highly rationalized workplaces who were concerned about the limiting effects of their own organization on knowledge production.

The early handbooks that were adopted in these settings are remarkable for a number of reasons. In their calls for thinking beyond existing knowledge, handbooks drew on (and fostered) a language of anti-conformity, free association, and the bracketing of usefulness. Many techniques were geared at collective creativity, although later manuals were adapted to include techniques for individuals to hone their creative self (and either way, it was cast as self-satisfying for the newly emerging “creative man”). They index a shift away from experience, which is deemed inadequate to think through the challenges of the present, let alone of the future. In creative thinking techniques, one should, instead, train oneself to be unencumbered by any past insights. This also explains the

egalitarian principle that “everybody has ideas,” widely promoted in many of the manuals. A *Time* report from 1957 gave a description of a brainstorm session:

They sit around in a comfortable, yellow-painted (yellow is considered conducive to thought) brainstorm room furnished in homey knotty pine, have plenty of pads, pencils and cigarettes. Lunch is served, then the session begins. A central problem . . . is presented, and everyone storms ahead. No idea is too fantastic; a cardinal rule is that no one laughs at an idea. If anyone is thoughtless enough to say, “It won’t work,” he is sternly reminded that such remarks are taboo by the chief brainstormer, who clangs a schoolmarm’s bell at him.

As can be gleaned from the “stern reminder,” to get at new ideas, early creative thinking techniques were very disciplined undertakings. Brainstorming was originally defined, for instance, in military idiom. One was “using the brain to storm a problem,” and freely associated “in commando fashion.” Creativity was cast as embodied practice, in which one had to train one’s mental muscle to “think freely” (rather than judiciously). Creative thinking techniques thus alluded to a managed form of freedom. Scientists, workers, engineers, military officers, and housewives had to manage their own minds so as to think more and differently—to overcome inhibitions, to learn to freely associate, to mine their unconsciousness.

Despite its semantics of pushing thought beyond the boundaries of existing knowledge, creative thinking was usually undertaken with a fairly limiting goal in mind. It was geared at problem solving—in government, in corporations, in engineering, in warfare. Hence, just as “thinking outside the box” refers to the solution to a problem by thinking creatively about the quandary of a nine-dot square puzzle, creativity itself, despite its connotations of operating in a space “beyond” existing knowledge, was very much related to—but not questioning—the territory of the problems that call for its employment.¹ Moreover, even if the hierarchical organization was criticized in the creative practices, and even as participants were encouraged to think for themselves, the ideation was organized specifically to serve institutions, to increase the knowledge base of organizations like the military or manufacturing corporations. Hence, while setting up a dichotomy in which time is being sequestered from all-too practical matters (semantically not unlike the IAS’s founding principles), creative thinking techniques were in the end geared at useful knowledge. Free association, creative ideation, and free-wheeling brainstorm sessions were used to engage unknowns

(Continued on page 17)



In the June 11, 1956 issue of *Life* magazine, members of the U.S. Navy are seen participating in programs designed to stimulate creative thinking.

¹ In these puzzles, all nine dots should be passed by drawing four continuous straight lines without lifting the pencil—this puzzle can only be solved by drawing outside the nine dots.

(how to survive behind enemy lines, how to rebuild infrastructures after an atomic attack). These unknowns were not an occasion to facilitate the pursuit of curiosity, let alone to rethink the framing of the problem, but to enable concrete knowledge production within the parameters of the problem. The survival of the U.S. population, it was said, and at least of soldiers, depended on it. Creative thinking techniques were developed and disseminated in military survival courses, not to ignite blue-sky research, nor to raise questions about the (f)utility of war, but to facilitate very concrete survival in unforeseen situations. Even the U.S. response to the Sputnik shock—which instigated a serious self-examination regarding knowledge production and a renewed commitment towards science and education—was very much focused on training citizens to solve particular challenges in the near future (moonshots were in those days really that, efforts to reach the moon).

While IAS founding Director Abraham Flexner boldly stated that practical use was not the justification for scientific pursuits, the practical use *was* thus the justification for the introduction of creative thinking techniques in military and industrial settings. To be sure, the language of uselessness was espoused in creative thinking techniques, but its incorporation indexed that uselessness was, ironically, made applicable, and thus defanged from the temporal and fundamental conditions that characterize and sustain basic research. Similarly, while Flexner's call for the cultivation of curiosity was predicated on protection from being “deflected by considerations of immediacy of application,” in creative thinking techniques, the immediacy of application was also bracketed ... but only briefly. The timescales of knowledge-production in creative thinking techniques and in fundamental science are in a sense incommensurable. While by its very nature, in fundamental science, you don't know what you are going to find, *nor when*, in the case of brainstorming—which prohibited immediate calls for practicability; think of the schoolmarm's bell in the quote above, which aimed to induce laughter and a return to a free-wheeling mood—ideas were often sorted out by supervisors within twenty-four hours. Creative thinking techniques were thus geared at thinking something *now*.

In sum, the processes of problem solving and the pursuit of fundamental science are often defined as contradistinctive. At the very least, their temporalities of inquiry are incommensurable (compare one day to thirty years). Moreover, whereas in creative thinking exercises the problem is not itself up for reconsideration, examining the very formulation of the problem is at the heart of basic science. Thus, while some of the language is similar—the objective of a move beyond existing knowledge through freedom of thought, the unlocking of creative thoughts through a deferral of questions of utility, and a seclusion from practical matters—the institutional conditions of both pursuits of knowledge are wildly dissimilar. Creative thinking techniques were primarily peddled in settings where thinking was boxed in. At the IAS, by design, there are no institutionally enforced limits to knowledge production that would propel one to “look beyond” those strictures. On the contrary, its very institutionalization of freedom (including the freedom from practical obligations) make more self-disciplining or managerial creative thinking practices unnecessary. Which is not, by any means, to say that the IAS doesn't foster creativity, but given the conditions under which IAS Members are laboring, they hardly required *disciplinary* actions. The IAS is of course a curious place to extricate creativity from intelligence to begin with (as Drevdahl proposed). And as a place for an academic elite, it is probably not the best representative of the principle that “everybody has ideas.” What is more, this elite is not a population that is particularly amenable to measurement (as soldiers and children may be). Oppenheimer stated as much by explaining that it was not proper for him to encourage Drevdahl to contact the IAS Members, “nor is it consistent with the conditions of membership that our members, as members, be encumbered with any such operations.” A creativity researcher descending on IAS's grounds might be just the thing that would get in the way of Members' emerging thoughts. ■

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Talking Points

On mathematics and science, religion and free speech, and gender and democracy

How do we fit into our mathematical descriptions? Well, one thing I'll tell you is that in general, when you have dualities, things that are easy to see in one description can be hard to see in the other description. So you and I, for example, are fairly simple to describe in the usual approach to physics as developed by Newton and his successors. But if there's a radically different dual description of the real world, maybe some things physicists worry about would be clearer, but the dual description might be one in which everyday life would be hard to describe.

—Edward Witten, Charles Simonyi Professor in the School of Natural Sciences, in “A Physicist's Physicist Ponders the Nature of Reality,” *Quanta Magazine*, November 28, 2017, bit.ly/2mv6JUR

Inevitably the Qur'an is rooted in its time, just as the brutal parts of the Hebrew Bible are. Even so, much of what the Qur'an proclaims is more benevolent and less barbarous than many of the fundamentalist doctrines that emerged in later centuries. We must remember that there is no jihad in the sense of holy war in the Qur'an and that there is no legal system called sharia. The Muslim Holy Book undoubtedly affirms the need to destroy those who take up arms against the One God. But it proudly acknowledges its affinity with the two other great monotheistic religions that preceded it and recognizes their prophets. This is why the Qur'an firmly anchors Islam among the Abrahamic religions.

—Glen W. Bowersock, Professor Emeritus in the School of Historical Studies, in “The Voice of God,” *The New York Review of Books*, December 7, 2017, bit.ly/2iuqCZE

We can respect the right of free speech without having to respect the ideas being uttered. Critical thinking is precisely not a program of neutrality, not tolerance of all opinion, not an endorsement of the idea that anything goes. It is about how one brings knowledge to bear on criticism; it is a procedure, a method that shapes and disciplines thought.

—Joan Wallach Scott, Professor Emerita in the School of Social Science, in “How the Right Weaponized Free Speech,” *The Chronicle of Higher Education*, January 7, 2018, bit.ly/2Hhuc5

#MeToo has been such a big catalyst for what looks every day more like the emergence of a new feminist movement, because it speaks to women across the class, race, and sexuality divides. The movement points to the fact that sexual harassment and violence in many ways functions as a “great equalizer” among women because the overwhelming majority of us have experienced it in some form, regardless of our backgrounds.

—Sara Farris, Visitor in the School of Social Science, in “#MeToo Shows Sexism is Not Men of Color's Prerogative,” *Al Jazeera*, February 10, 2018, bit.ly/2HhtcNe

If American citizens are good democrats, they will always be suspicious of government officials, and that will make them receptive to the information that whistleblowers provide. But they ought to be suspicious of whistleblowers, too. Citizens may not need to know the information that a whistleblower provides—indeed, the whistleblower might be acting for profit or publicity and not out of a desire for more democratic decision-making or a concern for law and morality. Sometimes, however, whistle-blowing opens a debate that should have started long before and exposes government activities that many citizens strongly oppose.

—Michael Walzer, Professor Emeritus in the School of Social Science, in “Just and Unjust Leaks,” *Foreign Affairs*, February 20, 2018, bit.ly/2HLE6vP

By investing in basic science, many other societal issues are addressed. Think about the money spent on defense, health care, and education. These days we are able to deal with diseases at the molecular level, only because fifty years ago we allowed scientists to ask basic questions about the foundations of life. Basic research is not a cost. It is an investment that in the end will allow us to be much more cost effective in all of the other subjects.

—Robbert Dijkgraaf, Director and Leon Levy Professor, in “When ‘Useless’ Research Has Long-Term Benefits,” *Innovation Hub*, February 23, 2018, bit.ly/2HzdZP

Phenomena with different levels of complexity are understood in terms of different irreducible concepts—turbulence, survival, alertness, and so forth. The brain is an assemblage of cells; a painting is an assemblage of chemical pigment. But what's important and interesting is the pattern and structure—the emergent complexity.

—Martin Rees, Institute Trustee and frequent former Member in the School of Natural Sciences, in “Cosmic Thinker Worries about Ends of Science and Humanity,” *Scientific American*, March 12, 2018, bit.ly/2vrJ0f3

change theorem, which was the starting point of Wiles's proof of Fermat's last theorem)."

The Abel Prize is an international award that acknowledges outstanding scientific work in the field of mathematics and comes with a monetary award of nearly \$800,000. The Prize will be given to Langlands by H.M. King Harald V at an award ceremony in Oslo on May 22. Since the Abel Prize was first bestowed in 2003, seventeen of the nineteen recipients have been affiliated with the Institute as Faculty or Members.

Langlands's profound insights in number theory and representation theory include the formulation of general principles relating automorphic forms and algebraic number theory; the introduction of a general class of L-functions; the construction of a general theory of Eisenstein series; the introduction of techniques for dealing with particular cases of the Artin conjecture (that proved to be of use in the proof of Fermat's last theorem); the introduction of endoscopy; and the development of techniques for relating the zeta functions of Shimura varieties to automorphic L-functions.

Born in British Columbia in 1936, Langlands grew up in a small Canadian town where his father owned a building supply store. He enrolled at the University of British Columbia at age sixteen, where he was drawn to mathematics over physics, particularly algebraic computations. After earning his bachelor's and master's degrees from the University of British Columbia, Langlands earned his Ph.D. from Yale University in 1960. He taught at Princeton University and Yale University, became a Member in the Institute's School of Mathematics in 1962, and was appointed to the Faculty of the Institute in 1972.

In his conjectures, Langlands drew on the work of Harish-Chandra, Atle Selberg, Goro Shimura, André Weil, and Hermann Weyl, among others with extensive ties to the Institute. His early work in representation theory involved adapting the methods of former IAS Professor Harish-Chandra to the theory of automorphic forms. "His papers were among the first—Selberg's papers and then Harish-Chandra's—that I studied very carefully, that I actually worked with, that I actually used in what I was doing," Langlands has said.

Endoscopy, which aims to distinguish the internal structure of automorphic representations of different groups, arose from Langlands's study of the zeta functions of Shimura varieties developed by former IAS Member Goro Shimura and in the theory of the discrete series, a theory created by Harish-Chandra at the Institute in the sixties. The modern theory of Shimura varieties, so named by Langlands in the 1970s, began with the development of the theory of abelian varieties with complex multiplication by Shimura, Yutaka Taniyama, and Weil in the mid-1950s.

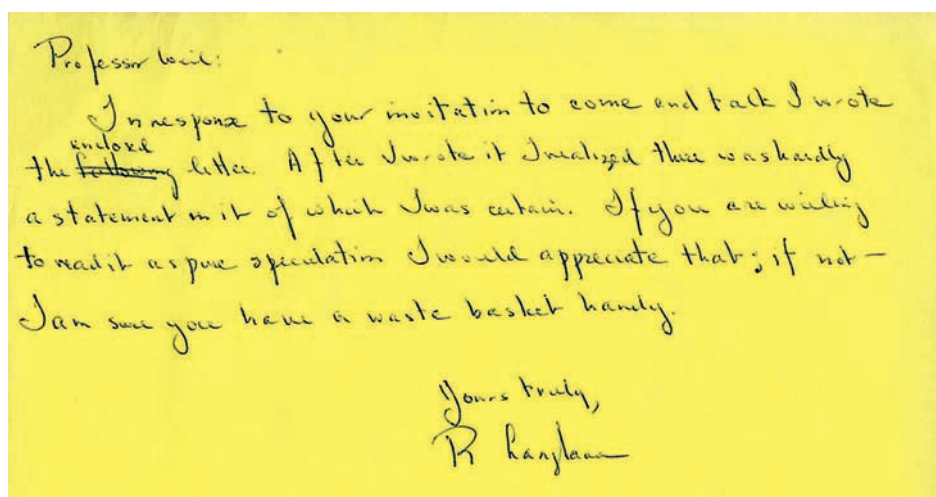
Langlands's principle of functoriality, which in the many cases where it has been proved uses the Selberg trace formula and the fundamental lemma to link automorphic representations of different groups through their L-groups, was informed by the theory of class fields, and the representation theory of semi-simple Lie groups in the form given to it by Harish-Chandra.

Some aspects of the Langlands program have been proven, such as Laurent Lafforgue's proof of the "Langlands conjecture for function fields," which Lafforgue presented in a series of lectures at the Institute in 1999 and for which he won a Fields Medal in 2002. While a Member at the Institute, Bao Châu Ngô realized a proof of the fundamental lemma, a technical device formulated by Langlands that links automorphic representations of different groups, for which Ngô was awarded a Fields Medal in 2010. Other aspects have led to proofs of seemingly unrelated theorems, such as Andrew Wiles's 1994 proof of Fermat's last theorem.

Recommended Reading and Viewing: "Robert P. Langlands Is Awarded the Abel Prize, a Top Math Honor," Kenneth Chang, *New York Times*, March 20, 2018: [ow.ly/Zgbm30jzXfq](https://www.nytimes.com/2018/03/20/us/politics/robert-p-langlands-abel-prize.html).

View the 2018 Abel Prize announcement at ow.ly/jqRJ30jzXjJ.

Listen to remarks made by Robbert Dijkgraaf, IAS Director and Leon Levy Professor, as part of the 2018 Abel Prize activities: ow.ly/c7M850h8FFt.



In a seventeen-page handwritten letter to IAS Professor André Weil in 1967, Robert Langlands outlined the conjectures for which he would receive the 2018 Abel Prize. In his cover note, Langlands wrote: "If you are willing to read it as pure speculation I would appreciate that; if not — I am sure you have a waste basket handy."

Much of the modern theory of automorphic forms is governed by two fundamental problems that are at the heart of the Langlands program: Langlands's principle of functoriality and the general analogue of the Shimura-Taniyama-Weil conjecture on modular elliptic curves. The work of Wiles that led to the proof of Fermat's last theorem suggests that the two problems, among the deepest questions in mathematics, are inextricably linked.

In addition to changing the field of automorphic forms drastically, making the infinite-dimensional representation theory of reductive groups into a major field of mathematical activity, and introducing a general class of L-functions that have had major

consequences for algebraic number theory, Langlands's conjectures have had a significant influence on other fields, such as physics. In the geometric Langlands program, created by former IAS Member Vladimir Drinfeld and collaborators, some of the ideas are converted from number theory into statements in geometry. The geometric form is particularly rich for implications in theoretical physics, especially string theory. In 2006, Edward Witten, Charles Simonyi Professor in the School of Natural Sciences, cowrote a 225-page paper on the relation of part of the geometric Langlands program to ideas of the duality between electricity and magnetism.

Among Langlands's honors are the Shaw Prize in Mathematical Sciences (2007); the Frederic Esser Nemmers Prize in Mathematics (2006); the Grande Médaille d'Or (Gold Medal) of the French Academy of Sciences (2000); the Wolf Prize in Mathematics (jointly with Andrew Wiles, 1996); the inaugural National Academy of Sciences Award in Mathematics (1988); the Common Wealth Award (1984); and the American Mathematical Society's Cole Prize (1982). —Kelly Devine Thomas, *Editorial Director*

On March 20, the day the Abel Prize was announced, the Institute community gathered in Simons Hall to celebrate Robert Langlands with a reception and brief remarks, excerpts of which follow.

Whether you are a Platonist or not, I think mathematicians often feel that their research is a discovery, not an invention. Math is perhaps an archeological excavation. And many of us are very happy to find just a small fragment. And some of us find a beautiful treasure. But very rarely does one find, as you did, Bob, a Rosetta Stone, to use André Weil's favorite metaphor. —Robbert Dijkgraaf, *Director and Leon Levy Professor*

This year, in the School of Math we have a very special activity in and around the arithmetic theory of locally symmetric spaces. There have been very few lectures in which Bob's techniques and conjectures have not appeared in the first five minutes. And in almost all the lectures, his ideas remain everywhere dense. —Peter Sarnak, *Professor in the School of Mathematics*

Bob is very well known for number theory and representation theory, but his interests go far beyond that. He was really responsible for broadening our School, bringing in different directions because he has such broad interests. In fact, one of the things that is maybe not so well known is that, when I arrived, he was working in statistical mechanics. And he actually made very important conceptual progress there. Things which are called SLE these days had their roots in some of Bob's work where he was understanding geometric ideas behind statistical mechanics. —Thomas Spencer, *Professor Emeritus in the School of Mathematics*

The majority of my work has been devoted to working on the beautiful theory that Robert has put forward and trying to poke a little bit at the edges of what he's suggested. And I'm certainly not the only one. There's a large percentage of the audience who owes their career in some form to the vision that Robert has put forward. I was ecstatic today when I heard about this prize. It is very richly deserved and I'm just happy to be here and to say thank you to him for his mathematics and for his encouragement. —Jayce Getz, *Member in the School of Mathematics*

expository skills make him an ideal appointment for the School of Mathematics.”

Robbert Dijkgraaf, Director of the Institute and Leon Levy Professor, added, “Camillo is an outstanding mathematician whose deep analytical skills, in combination with his enthusiasm and versatility, will continue to lead the pursuit of the field’s most challenging questions. We are extremely excited to welcome Camillo to the Faculty of the Institute.”

“The Institute’s wonderful environment provides an unrivaled opportunity for collaborating with extraordinary researchers,” said De Lellis of his appointment. “Joining the Faculty of the Institute is both an exceptional honor and a daunting challenge, and I am excited to make my own contributions to such a unique place.”

A distinguished mathematician, De Lellis is well known for his pioneering work on geometric measure theory and, in particular, regularity theory of minimal surfaces. De Lellis, together with collaborator Emanuele Spadaro, ambitiously examined and reopened the work of Frederick J. Almgren, frequent Member in the School of Mathematics, and his 1,000-page proof on partial regularity theory. De Lellis and Spadaro utilized pioneering techniques, coupled with a novel approach, to craft an accessible proof that could be used more widely throughout the field. Their work resulted in a concise, modern version of the theory that not only strengthened Almgren’s original assertion, but also presented many new insights. De Lellis’s remarkable contribution to this fundamental area of mathematics created a transparent proof of regularity and opened new lines of inquiry for geometric analysts to explore.

De Lellis’s work also focuses on nonlinear partial differential equations in differential geometry and the mathematics of turbulent flows in fluid mechanics. De Lellis and his collaborator, László Székelyhidi, Jr., former Member in the School of Mathematics, transformed the area through major contributions to the mathematical theory of fluid turbulence, primarily with their work on the Euler equations and Onsager conjecture. Through a series of papers, De Lellis and Székelyhidi developed a new and exciting route to the conjecture by combining Mikhael Gromov’s convex integration theory together with the embedding theorems of John F. Nash, Jr., former Member in the School of Mathematics. De Lellis’s remarkable ability to utilize cutting-edge methods to connect seemingly unrelated areas of mathematics resulted in a monumental breakthrough in the field.

De Lellis’s groundbreaking achievements in fluid dynamics and the regularity of minimal surfaces earned him the prestigious Fermat Prize in 2013. His transformative and original work in the field has also resulted in the Stampacchia Gold Medal (2009); the SIAM Activity Group on Analysis of Partial Differential Equations Prize (2013); the Caccioppoli Prize (2014); and the Lucio & Wanda Amerio Gold Medal Prize (2015). He was also an invited speaker at the 2010 International Congress of Mathematicians in Hyderabad, India, and a plenary speaker at the 2012 European Congress of Mathematicians in Kraków, Poland.

De Lellis earned degrees from Scuola Normale Superiore di Pisa and the University of Pisa. He held a postdoctoral position at the Max Planck Institute for Mathematics in the Sciences (2002), followed by a postdoctoral residency at Eidgenössische Technische Hochschule Zürich (2003). De Lellis joined the faculty of Universität Zürich in 2004 as Assistant Professor of Mathematics, and he became Professor in 2005. He is an engaged member of the mathematical community and serves on the editorial boards of many leading publications in the field, including *Annals of PDE*, the *Archive for Rational Mechanics and Analysis*, *Calculus of Variations and Partial Differential Equations*, *Inventiones Mathematicae*, and the *Journal of Differential Geometry*. ■

School of Historical Studies. “The breadth of her interests, her leadership in the profession, and her energy and enthusiasm all indicate that she will be a stimulating, supportive, and generous presence at the Institute for Advanced Study, and a most worthy successor in early modern studies to Professors Sir John Elliott and Jonathan Israel.”

Robbert Dijkgraaf, Director of the Institute and Leon Levy Professor, added, “Francesca is an extraordinary historian whose transformational work advances the frontiers of knowledge in early modern studies and creates new paths of research in the field. We are thrilled to welcome Francesca Trivellato to the Faculty of the Institute.”

Of her appointment, Trivellato said, “This is the opportunity of a lifetime—one that I could have never foreseen and that I am humbled and excited to have been offered.”

A world-renowned scholar in the field, Trivellato has published extensively on early modern Italian history, Jewish history, religion and trade, and trans-regional familial networks. In her first book, *Fondamenta dei vetrai: Lavoro, tecnologia e mercato a Venezia tra Sei e Settecento* (Donzelli, 2000), Trivellato investigated the transformation of Venetian glass in the seventeenth and eighteenth centuries, when the city was a major technological hub producing glass beads, bottles, mirrors, lamps, and other objects that were exported throughout the Mediterranean and fueled the Atlantic trade in African slaves and North American beaver fur. Trivellato’s thorough examination of the adaptive changes the Venetian glass sector underwent during the last two centuries before the industrial revolution yielded novel insights into the history of technology, craft guilds, women’s labor, and colonial trade.

Taking an innovative approach to the study of cross-cultural trade in her second book, *The Familiarity of Strangers: The Sephardic Diaspora, Livorno, and Cross-Cultural Trade in the Early Modern Period* (Yale University Press, 2009), Trivellato blended archival research with historical narrative and economic analysis to understand how a small group of Sephardic Jews based in Livorno, Tuscany, traded in regions near and far in the seventeenth and eighteenth centuries. In the work, Trivellato tested assumptions about ethnic and religious trading diasporas and networks of exchange and trust. Her extensive research in international archives—including over 10,000 merchants’ letters written between 1704 and 1746—challenged common assumptions about the business relations between Jews and non-Jews across the Mediterranean, Atlantic Europe, and the Indian Ocean. Trivellato’s analysis uncovered instances in which business cooperation between strangers relied on language, customary norms, and social networks more than the progressive rise of state and legal institutions. This extraordinary work garnered much acclaim, including the 2010 Leo Gershey Award for the most outstanding work published in English on any aspect of seventeenth- and eighteenth-century European history, awarded by the American Historical Association, and was the co-winner of the 2010 Jordan Schnitzer Book Award for best book in Early Modern and Modern Jewish History published in English between 2006 and 2010, awarded by the Association of Jewish Studies. It was also on the long list for the 2010 Cundill Prize in History given by McGill University.

In addition to these two fundamental books in the field, Trivellato’s contribution to historical scholarship extends to over fifty edited volumes, book chapters, and journal articles. She recently completed *The Promise and Peril of Credit: What a Forgotten Legend about Jews and Finance Tells us About the Making of European Commercial Society* (Princeton University Press, forthcoming), a novel account of the excitement and fears that accompanied the rise of impersonal credit markets from the commercial revolution of the Middle Ages to the triumph of industrial capitalism. In recent writings, Trivellato has also explored the history of maritime and commercial law, Renaissance Italy and the Muslim Mediterranean, and the merits and pitfalls of microhistory and global history.

Trivellato is currently working on designing a digital platform for the analysis and visualization of the longest and most homogenous series of business contracts from pre-industrial Europe: roughly 5,000 limited partnerships registered in Florence from 1445 to 1808.

Trivellato earned a B.A. from Università Ca’ Foscari Venezia, Italy (1995), a Ph.D. in Economic and Social History from the Università Luigi Bocconi, Milan, Italy (1999), and a Ph.D. in History from Brown University (2004). From 2001–03 she was Assistant Professor of Early Modern European History at Università Ca’ Foscari Venezia. Trivellato joined the faculty of Yale University in 2004 as Assistant Professor of History, and she became Professor in 2007. During her career at Yale University, she was named the Frederick W. Hilles Professor of History in 2012 and recently became the Barton M. Biggs Professor of History (2017). Trivellato has also held visiting appointments at various institutions, including the École des Hautes Études en Sciences Sociales, Paris (2010, 2017), the California Institute of Technology (2012), and the Paris Institute of Political Studies (2016).

Trivellato and her work have been recognized with numerous honors and fellowships. In addition to her membership in the School of Historical Studies, Trivellato has held a Fulbright Scholarship (1996–97) and fellowships from the Radcliffe Institute for Advanced Study (2006–07), the American Council of Learned Societies (2006–07), the American Academy in Berlin (2013), and the John Simon Guggenheim Memorial Foundation (2012–13). Trivellato is on the editorial and advisory boards of many leading publications in the field, including the *American Historical Review*, the *Journal of Economic History*, *Jewish Social Studies*, and *Trame Globali*. ■

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