

# MENDEL SYMPOSIUM

VILLANOVA  
UNIVERSITY

Celebrating the 150<sup>th</sup> Anniversary of Mendel's  
Paper *Experiments in Plant Hybridization*  
and its influence on modern genetics.

**VILLANOVA ROOM, CONNELLY CENTER**

**DECEMBER 7, 2015**



**VILLANOVA**  
UNIVERSITY



## WELCOME TO THE INAUGURAL GREGOR MENDEL SYMPOSIUM

Villanova University was founded by the Augustinian Order in 1842. As a national Augustinian institution of higher education, Villanova is one of **the custodians of Gregor Mendel's legacy**. The accomplishments of this 19th century Augustinian friar, teacher, biologist and mathematician have helped shape the world's collective understanding of genes, crossbreeding and heredity. Mendel is celebrated on the Villanova campus by the state-of-the-art **Mendel Science Center**—a facility where his legacy is celebrated daily by students and faculty who teach, study and carry out research.

At the east entrance to the Mendel Science Center is Mendel Plaza, where a monumental **7-foot bronze sculpture of the genetics pioneer** presides over the campus. The statue was modeled after Theodore Charlemont's Mendel memorial in Brno, Czech Republic, and was sculpted by James Peniston of Laran Bronze.



FRANK MALONEY

Villanova is home to four of Mendel's **papers**. His most famous and seminal work, *Versuche über Pflanzen-Hybriden* (*Experiments in Plant Hybridization*), published in 1866 in *The Proceedings* of the Natural History Society of Brünn, is in Falvey Memorial Library, a gift in 1999 from the Augustinians of the Province of St. Thomas of Villanova.

In 1928 the University established the **Mendel Medal Award** to recognize the scientific accomplishments and religious conviction of outstanding scientists. The list of recipients is composed of some of the world's most brilliant scientists including many Nobel Prize winners. In stipulating that the Mendel Medal was to be awarded to "outstanding scientists who have . . . given practical demonstration of the fact that between true science and true religion there is no real conflict," Villanova affirmed and continues to affirm the sacred connections between science and religion using as its model the great Augustinian scientist **Gregor Mendel**.



# SCHEDULE

7:45–8:15 a.m. **LIGHT BREAKFAST AND COFFEE**

8:15 a.m. **WELCOME**

## SESSION I: MENDEL AND HIS CONTEXT

8:30–9:15 a.m. **MENDEL'S MILIEU** | **Simon Mawer**  
Author of 12 books, including, *Mendel's Dwarf* (Man Booker Prize Nominee) and *Gregor Mendel: Planting the Seeds of Genetics*

9:15–10 a.m. **PRESERVING THE LEGACY OF MENDEL:**  
**Hugo Iltis (1882–1952), Jaroslav Kříženecký (1896–1964), Vítězslav Orel (1926–2015)** | **Ondřej Dostál**  
Director, Mendel Museum; Professor, Masaryk University, Brno

10–10:45 a.m. **WHAT HAPPENS IN MENDEL'S PAPER** | **Gregory Radick**  
University of Leeds, Professor of History and Philosophy of Science; Director, Leeds Humanities Research Institute; Editor-in-Chief, *Studies in History and Philosophy of Biological and Biomedical Sciences*; President, British Society for the History of Science

10:45–11:30 a.m. **Q&A SESSION**

11:30 a.m.–12:30 p.m. **LUNCH** (complimentary box lunches will be provided)

## SESSION II: MODERN GENETICS

12:30–1:15 p.m. **PERSONAL GENETICS** | **Robert C. Green**  
Geneticist and Associate Physician, Brigham and Women's Hospital; Associate Professor of Medicine, Harvard Medical School; Director, Genomes2People Research Program

1:15–2 p.m. **PERSONALIZING CANCER THERAPY** | **Patricia LoRusso**  
Yale University, Professor of Medicine (Medical Oncology); Professor of Medicine; Associate Director of Innovative Medicine at Yale Cancer Center

2–2:30 p.m. **Q&A SESSION**

2:30–2:45 p.m. **BREAK**

## SESSION III: ETHICAL, LEGAL AND SOCIAL IMPLICATIONS (ELSI)

2:45–3:30 p.m. **GOOD GENES, BAD GENES: SOCIAL USES AND ABUSES OF MENDELISM** | **Nathaniel Comfort**  
The Johns Hopkins University, Professor, Department of the History of Medicine

3:30–4:15 p.m. **GENETICS AND LAW/PRIVACY AND THE GENOME**  
**Pilar Nicole Ossorio**, University of Wisconsin Law School

4:15–4:45 p.m. **Q&A SESSION**

4:45–6 p.m. **MODERN GENETICS ROUNDTABLE**  
featuring all speakers and **Sarah-Vaughan Brakman**, **James McCartney**, **Stephen Napier**  
Department of Philosophy, Villanova University  
**Ana Iltis**  
Director of the Center for Bioethics, Health and Society, Wake Forest University

6–7 p.m. **RECEPTION WITH SPEAKERS, FACULTY AND STUDENTS**



KAIL ELLIS, OSA, PHD

**Brunn Realschule** where Mendel delivered his paper *Versuche über Pflanzen-Hybriden* (*Experiments in Plant Hybridization*) to the Natural Science Society in 1865.



KAIL ELLIS, OSA, PHD

**St. Thomas Monastery** in Brunn. Where Gregor Mendel entered the Augustinian Order and was ordained to the priesthood in 1847.

# SPEAKERS

Participants in the symposium include several of the world's leading minds who will discuss the lasting impact of Mendel's work across many disciplines, from law and medicine to sustainability and ethics.



**Simon Mawer**  
Author of *Mendel's Dwarf* and *Gregor Mendel: Planting the Seeds of Genetics*

Simon Mawer is a best-selling author of 10 novels and two nonfiction books who has frequently delved into genetics and the work of Gregor Mendel in his writing.

Mawer's fourth novel, *Mendel's Dwarf*, which was published in 1997, is the story of Mendel's great-great-nephew, a brilliant geneticist who sets out to target the gene that caused his dwarfism. The book was named a top-10 finalist for the Booker Prize and was listed as a *New York Times* "Book to Remember" for 1998.

Mawer, who holds a biology degree from Oxford University, also wrote *Gregor Mendel: Planting the Seeds of Genetics*, a nonfiction work published in 2006. His other books have been shortlisted for the Man Booker Prize, the Walter Scott Prize for Historical Novels and the Wingate Prize, adapted for the stage, and considered for film adaptations.



**Ondřej Dostál, PhD**  
Director, Mendel Museum, Masaryk University, Brno, Czech Republic

Ondřej Dostál, through his work as a museum curator, has shared the story of Gregor Mendel's life and work around the world.

The Director of the Mendel Museum since 2007, Dr. Dostál is the author of the museum's permanent exhibition, G.J. Mendel—Man, Abbott and Scientist. He has created and collaborated on exhibitions and delivered lectures about Mendel at the museum and around the Czech Republic, as well as in Taiwan, Slovenia, Singapore, Brazil and the United States. He is also the author of the celebration of the 150th anniversary of Mendel's lectures this year, under the auspices of the Czech prime minister and The Royal Society, the world's oldest scientific academy.

Dr. Dostál is second vice chairman of the Czech Association of Museums and Galleries, and a member of the Czech Geological Society.



**Gregory Radick, PhD, MPhil**  
Professor of History and Philosophy of Science, University of Leeds; Director, Leeds Humanities Research Institute

Gregory Radick, PhD, MPhil, is a historian and philosopher of science, with an emphasis on biology and the human sciences.

Based at the Centre for History and Philosophy of Science at the University of Leeds, Dr. Radick has focused much of his research on genetics. He is the author of *The Simian Tongue: The Long Debate about Animal Language*, the co-author of *Darwin in Ilkley*, and the co-editor of *The Cambridge Companion to Darwin*. His latest book, *Disputed Inheritance: The Battle over Mendel and the Future of Biology*, is under contract for publication.

Dr. Radick oversaw the establishment of the University of Leeds' Museum of the History of Science, Technology and Medicine, and he is the current President of the British Society for the History of Science.



## Robert C. Green, MD, MPH

Associate Physician and Geneticist, Brigham and Women's Hospital; Associate Professor of Medicine, Harvard Medical School; Director, Genomes2People Research Program

Robert C. Green, MD, MPH, is a renowned expert in translational genomics and health outcomes.

The author of more than 300 published articles, Dr. Green has received funding from the National Institutes of Health (NIH) continuously for 21 years and has participated in and presented at numerous national and international workshops and meetings related to the future of genomic medicine, translational genomics and personalized medicine.

Among other NIH-funded research, Dr. Green has led studies into the use of genome sequencing in the care of newborns, both healthy and ill; the integration of whole genome sequencing into clinical practice; the scientific and social impact of direct-to-consumer genetic testing services; and other emerging topics in translational genomics.



## Patricia LoRusso, DO

Professor of Medicine and Associate Director of Innovative Medicine, Yale Cancer Center

Patricia LoRusso, DO, is a leader in the development of new cancer drugs through clinical trials.

Dr. LoRusso was director of the Phase I Clinical Trials Program and of the Eisenberg Center for Experimental Therapeutics at Wayne State University's Barbara Karmanos Cancer Institute before joining the Yale Cancer Center in August 2015.

With 25 years of experience in the fields of medical oncology, drug development and early phase clinical trials, Dr. LoRusso is the recipient of several prestigious awards and has served as co-chair of the National Cancer Institute Cancer Therapy Evaluation Program Investigational Drug Steering Committee. She has also served on committees of the American Association for Cancer Research and the American Society of Clinical Oncology. She is the current president of Women in Cancer Research and a board member of the American Association for Cancer Research.



## Nathaniel Comfort, PhD

Professor, Department of the History of Medicine, The Johns Hopkins University

Nathaniel Comfort, PhD, is a researcher, historian, writer and teacher whose work has been focused on genetics for 25 years.

A professor in the Department of the History of Medicine at Johns Hopkins University since 2013, Dr. Comfort is also the Baruch Blumberg Chair of Astrobiology at the Library of Congress and NASA.

Dr. Comfort is the author of two books, *The Science of Human Perfection: How Genes Became the Heart of American Medicine* and *The Tangled Field: Barbara McClintock's Search for the Patterns of Genetic Control*; the editor of and a contributor to *The Panda's Black Box: Opening Up the Intelligent Design Debate*; and a contributor to *Nature*, the *New York Times Book Review* and National Public Radio, among other media outlets. He is currently at work on a biography of DNA.



## Pilar Nicole Ossorio, PhD, JD

Professor of Law and Bioethics, University of Wisconsin; Director, Ethics Scholar in Residence, Morgridge Institute for Research

Pilar Nicole Ossorio, PhD, JD, is a law professor and researcher whose interests include ethical and social issues in scientific research.

At the University of Wisconsin, in addition to her roles as a professor of law and bioethics at the Morgridge Institute for Research, Dr. Ossorio is co-director of the Law and Neuroscience Program, leader of the ethics core for the Center for Predictive Computational Phenotyping, and co-director of the Research Ethics Consultation Service.

Dr. Ossorio is a member of the Secretary's Advisory Committee on Human Research Protections within the U.S. Department of Health and Human Services; the advisory council for the National Heart, Lung, and Blood Institute; and the National Academies committee that is planning an international summit on human genome editing.

# MODERN GENETICS ROUNDTABLE



**Sarah-Vaughan Brakman, PhD**  
Associate Professor,  
Philosophy, Villanova  
University

Sarah-Vaughan Brakman, PhD, is a practicing clinical ethics consultant who is known nationally and internationally for her expertise in clinical medical ethics and in the ethics of embryo donation.

The founding director of the Ethics Program at Villanova, Dr. Brakman holds the Anne Quinn Welsh Faculty Fellowship in the Honors Program. She earned her master's and doctoral degrees in philosophy with a specialty in medical ethics through a joint program of Rice University and Baylor College of Medicine.

Dr. Brakman's work on filial obligation and long-term care policy, decision-making for individuals with developmental disabilities, ethics in assisted reproductive technologies and adoption ethics has appeared in many scholarly books and journals. She is the ethics consultant and chair of the National Ethics Committee of Devereux, the nation's largest nonprofit provider of behavioral and mental health care.



**James J. McCartney, OSA, PhD**  
Associate Professor,  
Philosophy, Villanova  
University, and Adjunct  
Professor, Villanova  
University School of Law

The Rev. James J. McCartney, OSA, PhD, teaches courses in bioethics, clinical ethics, bioethics and the law, the philosophy of medicine, philosophy for theology and the philosophy of law.

Father McCartney holds an MA from Augustinian College, an MS in cell and molecular biology from The Catholic University of America, and a doctorate in philosophy from Georgetown University. He previously served as Director of Philosophy Doctoral Studies and Chair of the Philosophy Department at Villanova, and he is also a past Director of the Bioethics Institute at St. Francis Hospital in Miami, Fla., and held academic and administrative positions at St. Thomas University in Miami.

A frequent lecturer on bioethical subjects both locally and nationally, he has authored one book, co-edited four books and authored numerous articles, and he serves on the editorial board of HealthCare Ethics Committee Forum.



**Stephen Napier, PhD**  
Assistant Professor,  
Philosophy, Villanova  
University

Stephen Napier, PhD, is an expert in epistemology and bioethics whose research interests include cognitive science and metaphysics of persons.

Dr. Napier earned a doctorate in philosophy from St. Louis University and completed a two-year, post-doctoral fellowship in clinical and research ethics at St. Thomas Hospital in Nashville, during which he performed numerous ethical consultations and was involved in the hospital's Institutional Review Board. Before coming to Villanova, he was a human research protections analyst at Cincinnati Children's Hospital and Medical Center. He has also served on University of Pennsylvania institutional review boards.

Dr. Napier is the author of a book, *Virtue Epistemology: Motivation and Knowledge*, and he has contributed to numerous scholarly journals.



**Ana S. Iltis, PhD**  
Director, Center for  
Bioethics, Health and  
Society, and Professor,  
Philosophy, Wake Forest  
University

Ana S. Iltis, PhD, is a widely published bioethicist whose work focuses primarily on organ donation and the ethical conduct of human research.

A graduate of Villanova University, Dr. Iltis earned her MA and PhD from Rice University. She holds an appointment in the Department of Social Sciences and Health Policy at Wake Forest School of Medicine and is the Director of the Interdisciplinary Minor in Bioethics, Humanities, and Medicine.

In addition to her work in the Center for Bioethics Health and Society and in the Philosophy Department at Wake Forest, Dr. Iltis serves on several National Institutes of Health data safety monitoring boards and holds a range of editorial positions.

She is working on a book on the foundations of research ethics and a project on neglected tropical diseases.



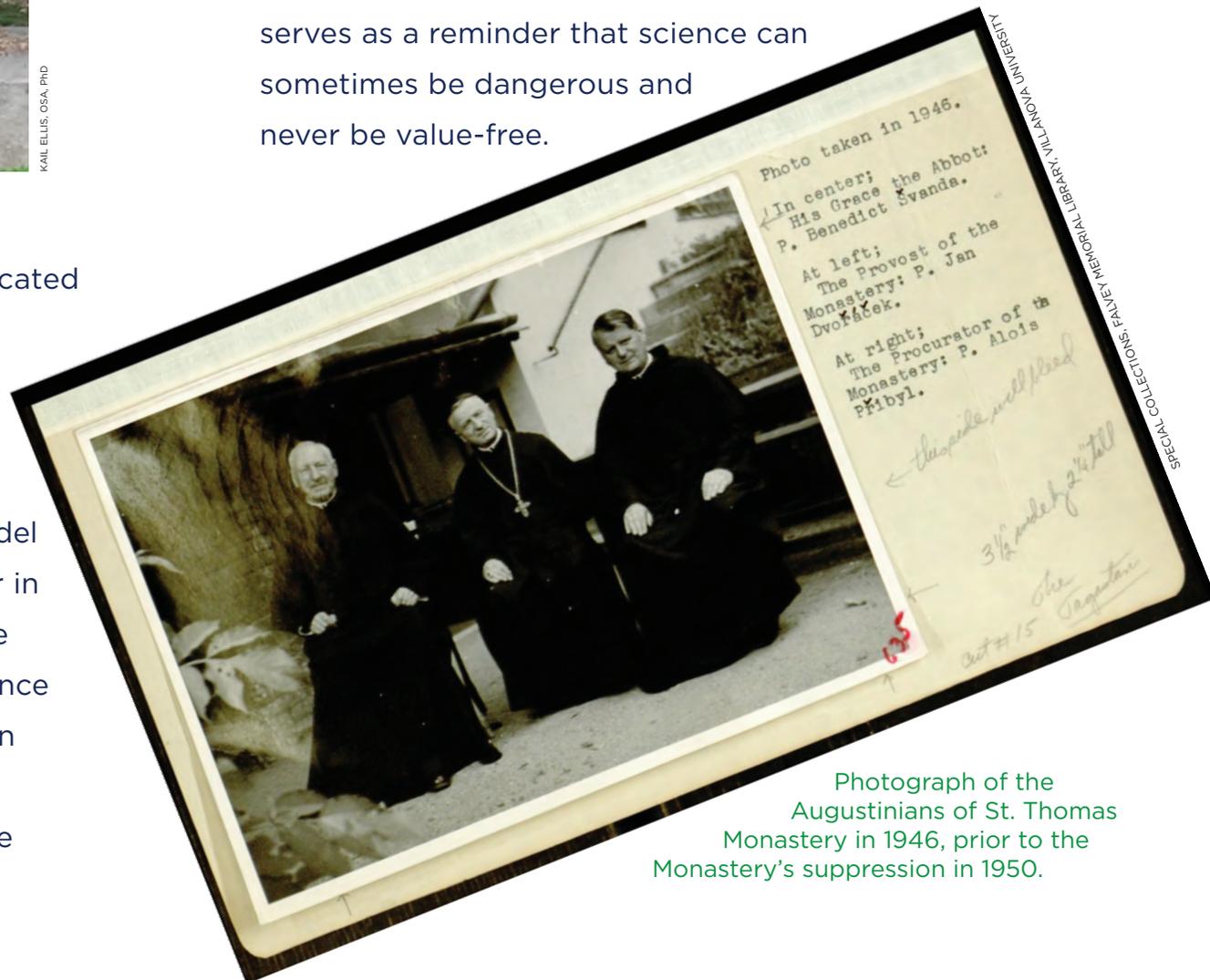
KAIL ELLIS, OSA, PhD

Theodore Charlemont's Mendel Memorial was dedicated in Brunn in 1910. The dedication was attended by thousands of individuals including Erich von Tschermak, William Bateson and other leading scientists of the day. Mendel's statue was placed in the large square facing St. Thomas Monastery, which was renamed Mendel Square. The coming of the Communist Party to power in Czechoslovakia in 1948 brought the country under the control of Moscow. The Soviet Union, under the influence of the agronomist, Trofim Lysenko, declared Mendelian genetics reactionary and erroneous in the 1930s and 1940s, replacing it with the teaching of the inheritance

of acquired characteristics. The teaching of Mendelian genetics was declared reactionary and erroneous, and banned in the Soviet universities. Geneticists who refused to comply were removed from their positions and sent to the Gulag.

With the imposition of Marxist ideology in Czechoslovakia, Mendel was denounced as a representative of the Church, and genetics was branded the "Fake products of the Catholic Church and Capitalism." In 1950, the secret police closed the Augustinian monastery in Brno, and the Augustinian friars were arrested and sent to labor camps. The Augustinian monastery buildings were given over to industrial organizations.

Finally, in 1959, Mendel's statue was moved from Mendel Square and consigned to the monastery garden, its fate serves as a reminder that science can sometimes be dangerous and never be value-free.



Photograph of the Augustinians of St. Thomas Monastery in 1946, prior to the Monastery's suppression in 1950.

## About Gregor Johann Mendel, OSA

Gregor Johann Mendel was born July 22, 1822, in Hynčice, Moravia, in what is now the Czech Republic. He attended local schools and in 1843 he entered the Augustinian Order at St. Thomas Monastery in Brünn. He began his theological studies at the Brünn Theological College and was ordained to the priesthood August 6, 1847.

The Augustinian Order was established in Moravia in 1350, and in Mendel's time St. Thomas Monastery was a center of creative interest in the sciences and culture. Its members included well-known philosophers, a musicologist, mathematicians, mineralogists and botanists who were heavily involved in scientific research and teaching. The magnificent library contained precious manuscripts and incunabula, as well as textbooks dealing with problems in the natural sciences. The monastery also held a mineralogical collection, an experimental botanical garden and a herbarium. It was in this atmosphere, Mendel later wrote, that his preference for the natural sciences was developed.

**Mendel the Teacher** After his ordination, Mendel was assigned to pastoral duties, but it soon became apparent that he was more suited to teaching. In 1849, he was assigned to a *Gymnasium* (secondary school) in the city of Znojmo and was well-received by the students. When he took the qualifying state examination for teacher certification, however, he failed. Recognizing that Mendel was largely self-taught, one of his examiners recommended that he be sent for further studies in the natural sciences. The abbot agreed, and Mendel was sent to the University of Vienna in order to improve his preparation for the re-examination. Mendel spent two years in Vienna (1851-1853) where he attended lectures and seminars in the natural sciences and mathematics. It was there that he acquired the empirical, methodological and scientific research skills which he was to apply to his later investigations. Mendel returned to teaching in Brünn in 1854 but when, two years later, he again attempted the state certification examination he became ill, most likely as a result of debilitating test anxiety, and withdrew. He did not pursue the examination further but continued to teach part time and devote himself to research.

**Mendel the Researcher** Mendel began his experiments soon after his return from Vienna. Using 34 different kinds of peas of the genus *Pisum*, which had been tested for their genetic purity, he tried to determine whether it was possible to obtain new variants by cross-breeding. Peas were carefully chosen because pollination could

be easily controlled and normally pea plants are self-fertilizing. His research involved careful planning; necessitated the use of thousands of experimental plants and extended over seven years. Mendel established two principles of heredity that are now known as the law of segregation and the law of independent assortment, thereby proving the existence of paired elementary units of heredity and establishing the statistical laws governing them. He became the first to understand the importance of a statistical investigation and to apply a knowledge of mathematics to a biological problem.

Mendel's findings on plant hybridization were presented in two lectures before the Society for the Study of the Natural Sciences in Brünn in 1865. His paper, *Versuche über Pflanzen-Hybriden* (*Experiments in Plant Hybridization*) was published in the society's Proceedings in 1866 and sent to 133 other associations of natural scientists and to the more important libraries in a number of different countries. Mendel corresponded with Karl von Nägeli who encouraged him to carry out his next series of experiments on various species of the genus *Hieracium* (hawkweed). Mendel was not able to replicate his findings as the hawkweed reproduces asexually, producing clones of the parent. In 1869 he published a report that hinted that the results were different from those obtained for *Pisum*, but left the problem open for further research. He also continued to conduct research in horticulture, apiculture, meteorology and astronomy. His *Pisum* work, however, was largely ignored until, in the spring of 1900, three botanists, Hugo de Vries (Holland), Karl Correns (Germany) and E. von Tschermak (Austria) reported independent verifications of Mendel's work which amounted to a rediscovery of his first principle.

On March 30, 1868, Mendel was elected abbot of St. Thomas Monastery. His new duties involved many civic responsibilities that took him away from his scientific work. He maintained a serene confidence despite the lack of recognition his work received. Just before his death January 6, 1884, he commented:

**“My scientific labors have brought me a great deal of satisfaction, and I am convinced that before long the entire world will praise the result of these labors.”**

His faith in his work was to be vindicated. Mendel remains one of the great biologists of the 19th century and the inspiration for one of the most challenging sciences of our time—genetics.



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