



GREY MATTER

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“Like the entomologist in search of colorful butterflies, my attention has chased in the gardens of the grey matter cells with delicate and elegant shapes, the mysterious butterflies of the soul, whose beating of wings may one day reveal to us the secrets of the mind.”

-Santiago Ramón y Cajal

SPAIN, 1897. Santiago Ramón y Cajal, world-renowned father of neuroscience, bends over his microscope, staining bits of brain tissue with dye. As the drop of dye spreads outwards from its source, he carefully draws the fragile lines of neurons and synapses and connectors; he calls them “the mysterious butterflies of the soul.” His intricate and elegant little trees branch out into hundreds of different directions. He’s discovering new cells and creating art, delighting in the grey area, tracing the trails of tissue that represent the grand orchestration of life inside each of us.

PITTSBURGH, 2014. One hundred and seventeen years later at Carnegie Mellon University, art professor Patricia Maurides inspires new generations of students to pursue interdisciplinary interests and keeps Cajal’s legacy alive at Carnegie Mellon.

GREY MATTER

By artistic trade, Maurides is a photographer. “It’s just part of who I am, and how I think and interpret the world.” Although she never consciously tries to capture the brain or other literal neurological elements in her photographs, many psychophysiological themes still end up finding a place in her art. “Memory and the concept of identity is very much a theme in my work. Neuroscience has interested me from the beginning; I have a background in biology that still influences my work.”

Maurides’ academic background is diverse. After earning a Bachelor of Science in Biological Sciences from the University of South Carolina, she took time off to travel and quench her wanderlust before deciding to come to Carnegie Mellon University for a Master of Fine Arts in Art.

“My first jobs after college were in research labs. I worked in labs in New York and here in Pittsburgh. I had a fortunate experience in my first job here; it was in Dr. Peter Berget’s laboratory studying the bacteriophage P22, which I loved for its structure and the gritty micrograph imagery.”

For Maurides, it’s not about the quantitative data, it’s about the visual representation. “I spent a lot of time in the lab doing DNA sequencing; I enjoyed the visual representations of DNA.”

Although the fine arts and the physical sciences are often viewed separately, Maurides insists they have a somewhat symbiotic relationship. Like Cajal with his neuron sketches, Maurides delights in the grey area (and in the grey matter) of art and science.

ART + BIOLOGY

From 1999 to 2006, Maurides spearheaded Carnegie Mellon’s Bachelor of Humanities and Arts (BHA) and Bachelor of Science and Arts (BSA) programs, serving as the programs’ first academic director. In hopes to inspire like-minded individuals, she designed and currently teaches *Art and Biology*, a studio laboratory course. *Art and Biology* historically serves students across the disciplines – whether you’re in to robots, literature, medicine, law, or painting, this class allows students to diversify their studies and think differently about the very things that make us *us*.

Going on its fifteenth birthday at Carnegie Mellon, *Art and Biology* is popular among students from all colleges, giving them an opportunity to creatively experiment with interdisciplinary concepts in both an art studio and a biology laboratory. This course has become a staple at Carnegie Mellon, encouraging interdepartmental collaboration from students and faculty alike.

“Most recently, my work is focused on launching a NeuroArt initiative consisting of collaborations, course design, and exhibitions,” Maurides says. “My hope is to create a bridge for students, faculty, and staff between the College of Fine Arts and the Center for the Neural Basis of Cognition – including Dietrich College and Mellon College of Science.”

ART + THE BRAIN

In her aim to advance literacy and interaction between the arts and sciences, Maurides introduced a new course this semester. *Art and The Brain* is modeled in the spirit of what students found interesting in *Art and Biology*. Students of all disciplines are welcomed to discuss consciousness, memory, and current and historical brain imaging technologies.

After listening to notable guest lecturers and conducting their own research, students then create visual, performative, or poetic reflections. The brain is a living muse. Students research neuroscience and neuropsychology while demonstrating fundamentals of the artistic process, expanding both scientific and artistic literacy.

The interdisciplinary nature of both *Art and Biology* and *Art and The Brain* encourages students to explore the permeable membrane between the natural sciences and the fine arts. Scientists are offered fresh ways of thinking and communicating about their work and artists are given new inspirational territory.

SOMETHING BIGGER

In her academic career, Maurides inspires hundreds of students to explore and revel in the interdisciplinary gray area. She inspires young minds to think simultaneously as scientists and as artists, urging them to find a muse in neuroscience, much like Cajal did with his illustrations all those years ago. Maurides further celebrates Cajal’s legacy and explores past and present neuropathological artwork in an upcoming exhibition at The Regina Gouger Miller Gallery at Carnegie Mellon University, located in the Purnell Center for the Arts.

“It grew out of a conversation” with Marlene Behrmann, Co-Director of Carnegie Mellon’s Center for the Neural Basis of Cognition.

A joint venture with the University of Pittsburgh, the CNBC supports cross-university research and international educational programming in neuroscience. This year, the CNBC and its world-class faculty of over 200 celebrates its twentieth anniversary.

Maurides and Behrmann have done joint collaborations and exhibitions before with their own research and with students' works before, but thought "let's do something bigger."

Maurides is curator for the upcoming Miller Gallery exhibition *Neurons and Other Memories: Work in and Around the Brain*, set to debut on October 10, 2014. Coinciding the CNBC's twentieth anniversary, the exhibition will display Cajal's works alongside Carnegie Mellon alumni, students, and faculty.

"Dr. Behrmann and I contacted the Cajal Institute in Madrid and asked them for permissions for us to print and exhibit some of his neurological illustrations because we find them so inspiring."

Somewhat like Maurides' classes, the exhibition focuses on a historical perspective of neuroanatomy. The interdisciplinary collaborative effort pulls together

the work of many CNBC neuroscientists with artists and students – many of whom have a connection with Carnegie Mellon.

Also open to the general public, the exhibition will be seen by over 300 neuroscientists that will be on campus for the 20th anniversary. In addition to Cajal's historic works and Carnegie Mellon alumni and faculty, the exhibition includes work from the Hunt Institute for Botanical Documentation and features the seventeenth-century Diderot Encyclopedia, which depicts interpretations of body and brain function from the French Enlightenment period.

Maurides is particularly excited to feature the works of some Carnegie Mellon alumni, such as Joana Ricou and Aaron Regal. Ricou's work focuses on the concept of self and one's place in the world, while Regal's work concerns identity and transformation, focusing on the self and consciousness.



In her piece *One, No One and One Hundred Thousand no. 24*, Joana Ricou explores the biological process and fragility of memory. This piece evokes sentiments of "Chinese Whispers" or "The Telephone Game," a children's game in which a phrase is whispered one-by-one through a chain of children. By the time the phrase has made its way through the chain, the original content of the first whisper is far removed from the whisper heard by the last child.



One of Aaron Regal's feature digital collages, *Net Generation Memory Palace*, depicts an ancient memory enhancement technique called The Method of Ioci. According to Regal, the memory technique instructs the user to visualize the mind as a literal architectural space, organizing thoughts and memories inside of the building as an architect would design rooms.



ONE AND THE SAME

Through *Neurons and Other Memories*, Maurides brings together the arts and the sciences to enhance and advance cross-disciplinary literacy in a publicly noticeable way.

“Typically only other scientists get to see a neuroscientist’s work.” Through the exhibition, neurological concepts are conveyed in a way that more people can appreciate and understand. Who knows? Perhaps *Neurons and Other Memories* will inspire the next generation of scientists, artists, and those who are the exceptional mixture of both.

Maurides’ work as exhibition curator and as a cross-disciplinary literacy advocate offers artists a whole new territory for exploring their own projects. Her work opens artists’ minds to new tools, new media, and new inspiration. For scientists, Maurides’ work offers new ways of thinking and speaking about science – ways that perhaps no scientist before had ever imagined. In the same way that we need our scientists to cure diseases and make societal advancements, we need our artists as mediums for translating culture.

Maybe the artist and the scientist are not so different. Maybe, like Cajal and Maurides, they are one and the same.

Regardless, the matter is anything but grey. “Whatever discipline you come from, looking at the brain from this perspective is inspiring.”