



UC SAN DIEGO

THE DIGITAL BRAIN LIBRARY

THE BRAIN OBSERVATORY



UC San Diego
SCHOOL OF MEDICINE

Where discoveries are delivered.SM

THE FASCINATING CASE OF PATIENT H.M.

Henry G. Molaison, known in the medical field as patient H.M., was born in 1926 and suffered from epilepsy as a boy. By his late 20s, his seizures had become so severe and frequent that he could no longer work nor live independently. In 1953, he underwent brain surgery with the hope that the convulsions would subside. The operation alleviated his condition but unexpectedly caused a profound and selective form of amnesia. Henry G. Molaison became permanently unable to create and experience new memories.

What made H.M. extraordinarily important as a medical patient is the fact that he generously participated in hundreds of studies for more than five decades and that he also willed his brain to scientific research. As he put in his own words:

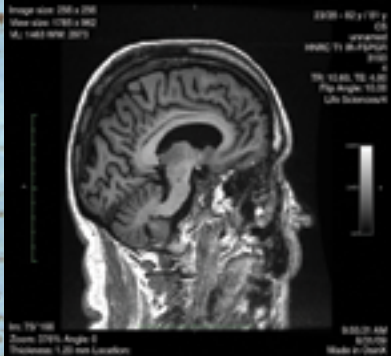
“*What they find out about me will help other people.*”

After patient H.M. passed away on December 2, 2008, his brain was brought to The Brain Observatory at UC San Diego where researchers began unraveling the hidden clues that could explain the mechanisms of his amnesia.

The story of H.M. was singularly fascinating, but every individual is bound to reveal something important about the brain and contribute to understanding what we have in common and conversely, what makes our life experience unique.



Henry G. Molaison
Brain Donor, 2008



THE DIGITAL BRAIN LIBRARY PROJECT

The Digital Brain Library Project at the University of California, San Diego is an unprecedented effort to compare what has been learned about human behavior and disease with the actual organ, the brain.

The challenge, over the next decade, is to archive the brains and the personal profiles of as many as one thousand participants.

Our motivation for such a large-scale project is straight-forward: if we create a large enough neurological collection that can be explored and visualized in unprecedented ways, then we can hope to glimpse at the fundamental features of the human brain and to decipher individual patterns of maturation and disease.

The result of this research will be a thousand characteristic portraits that combine anatomical detail with medical and personal histories.

The long-term outcome of the project will also be a greater awareness in society of the fascinating interplay between our mind and our biology that happens in every second of our lives.

These fundamental questions are bound to bring together scholars and professionals from diverse fields and disciplines, in the arts and sciences.

A VERY DIFFERENT BRAIN BANK

Traditional brain banks consist of anonymous specimens labeled with specific diseases. To study these brains, partial samples are excised and distributed to inquiring scientists. This is a 'destructive' process that is economical and efficient but once a specimen is processed, it is hardly suitable for any retrospective review or further studies. More importantly, it becomes impossible to reconstruct the complete anatomical or pathological picture of each brain in its entirety.

Thanks to unique technology developed by researchers at the UC San Diego Brain Observatory, it is now possible to transform the brain into an unabridged collection of detailed images that can be visualized at very high resolution, reassembled into 3-D models, and studied with virtual tools, without compromising its original integrity.

Crucially, these images are corroborated by medical, neuropsychological, and even biographical data, all of which make each case distinctively valuable.

The mission of The Digital Brain Library is to preserve and protect this incredible source of information for future yet unimagined questions. Making the collection available as it grows will improve medical treatments and the lives of the patients.



“We’re all born with the same kind of instrument, let’s say a violin. But how we play this violin and what we decide to play shapes this instrument during our lives. We can learn a lot by the wear-and-tear of life on our brain, how each of us has modified it. These could prove to be anatomical fingerprints of individuality, biological clues of what makes us who we are.”

Dr. Jacopo Annese
 Director, The Brain Observatory
 November 30, 2009 – *San Diego Union Tribune*

BRAIN DONATION

The Digital Brain Library could not exist without the generous participation of donors whose contribution, like patient H.M., goes beyond being a research participant. Our donors believe that our meticulous process is both a crucial contribution to medical research and a scientific celebration of their life. After all, our researchers will paint their most realistic and detailed portraits imaginable.

“Brain donation is another way of establishing a living will that greatly benefits medical research while advancing our knowledge of the biological foundations of human nature.”

The Digital Brain Library is actively reviewing cases of patients who have experienced neurological illness such as Alzheimer’s and Parkinson’s Disease. However, the endowment of healthy individuals is equally valuable and informative as they provide the baseline reference for normal brain maturation.

What should a normal brain look like at different ages? What are the features that we all have in common versus those that characterize each individual in health and disease? The Digital Brain Library will provide the answers to these questions.



UC San Diego
 SCHOOL OF MEDICINE

Jacopo Annese Ph.D.

Assistant Professor
 Radiology and Biomedical Imaging
 Director, The Brain Observatory

The Brain Observatory
 3510 Dunhill St.
 San Diego, CA 92121

Tel: (858) 822-4465
 Lab: (858) 534-3177
 jannese@ucsd.edu
 thebrainobservatory.ucsd.edu

Please contact us at (858) 822-4467 if you would like to learn more about how to support The Brain Observatory and The Digital Brain Library Project.

THE BRAIN OBSERVATORY
Department of Radiology
and Biomedical Imaging

3510 Dunhill Street

San Diego, CA 92121

thebrainobservatory.ucsd.edu