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## Memory and Consciousness in Tallinn

*"Mirror, mirror, on the wall, what's the fairest science of them all?"*

*"Why, yours, of course, master: the science of memory, consciousness, and the brain!"*

*"But, mirror, are you sure there is such a thing! I have never heard anyone talk about the science of memory, consciousness, and the brain."*

*"Well, master, now you have. What do you propose to do about it?"*

The mirror is clever. It shows political wisdom, in saying things that please the questioner, and yet it thinks surprisingly refreshing thoughts. Memory and consciousness have been objects of fascination to dedicated psychologists and other brain scientists for over a hundred years. Owing to the great complexity of the two concepts, however, the progress in their understanding over most of this time has been rather slow, and the quest for such understanding continues unabated. New coalitions and convergences of traditionally separate disciplines are emerging all the time. Although there have been as yet no public utterances made about a separate branch of the *science* of memory, consciousness, and the brain, it should be clear to anyone who has been close to the scene that the omission lies in the label and not in the to-be-labeled activity.

A four-day conference on the topic of "Memory, Consciousness, and the Brain" was held in Tallinn, Estonia, at the end of May 1998. Its purpose was to review the recent progress in the research on the topic of memory, consciousness, and the brain, to identify some of the acute outstanding problems, and to muse about future possibilities. The present

volume grew out of that conference. If you, dear reader, have picked it up and are reading these lines, you may be wondering about it all. Why was this conference held? Why in Tallinn? Who participated? And why add yet another edited book to the hypersaturated market of such books?

Scientific conferences are typically organized for the purpose of dissemination of knowledge derived from ongoing research. One scientist stands up and delivers a lecture, usually richly illustrated with slides or overheads, describing what she and her research group has “recently” discovered about a particular problem on which they have been working, and how the work reported changes or does not change what was already known about the problem. Sometimes the lecturer also tells the audience why the work she is describing is important. Others sit and take notice, and, if there is time left before the next speaker occupies the podium, they may ask questions or offer comments on what they have heard and seen.

Conferences of this sort represent a venerable thread in the traditions of science. For a long time, they did serve a vital function in the conduct of scientific affairs. But with the recent massive changes in communication technology, they have now become obsolete and hopelessly irrelevant. At the time when everyone lives in a giant McLuhanesque electronic village with instantaneous many-channel communication, conferences to announce data and ideas are, or at least should be, on their way to oblivion. People continue organizing and attending show-and-tell conferences solely out of habit, simply because there has been no signal given from heaven, or the White House, or Bethesda, to stop having them. One can now share one’s new findings and ideas with others more quickly and efficiently via the electronic highways than by waiting for the opportunity offered by the next conference. Equally important, one could, and now usually does, get one’s information from others electronically.

Given these plain and unvarnished facts, why yet another conference? The reason was simple—this one was planned to be a pointer to the future. It was meant to illustrate how conferences are to be in the electronic world. It was to be small, thereby allowing like-minded people to get to know each other, renew acquaintances, and discuss matters of mutual interest instead of listening to each other delivering old-fashioned lectures. It was to be a social occasion at least as much as an intellectual one. Scientists, even in the age of silicon, are still human; as such, they do love each other’s company and they love to talk, and neither Gutenberg nor Bill Gates has been able to offer an acceptable substitute for it. Hence the Tallinn conference, of a different kind: one for the future.

The directions regarding the rules of conduct in Tallinn were known in advance by all participants. They knew that they were to bring a single

idea, the most important one they could think of, to be discussed with others in Tallinn. They knew they had total freedom in the selection of their message, even if less freedom in its treatment. Naturally, there was to be no shop talk during the first night's opening reception. The first working day of the meeting was to be a light "get-acquainted" day, and the next two were heavy, full working days. In the meeting on the first day, everyone was going to have two minutes to tell the group what their important message was and why, plus a few minutes to deal with questions raised about it. During the working meeting, everyone was to have five minutes to further elaborate their important idea before its discussion by the group. All were further advised that the traditionalists would be able to satisfy their established needs for harmony and order when they wrote their paper for the edited book that was to emanate from the meeting.

This radical plan was received and followed by the group of creative and imaginative thinkers as one would have expected—creatively and imaginatively. The actual observance of the plan by individual participants ran the gamut from total compliance to utter disregard. Like members of any other species, as Charles Darwin was fond of pointing out, scientists too are individually hugely different. The whole thing turned into a situational projective personality test of the first order, making for an interesting subject of another whole book. The important thing is that everyone survived the trial to agree that the execution of the blueprint for scientific conferences for the future was a modestly huge partial success.

Why Tallinn? This is a much easier question to answer. We wanted an exotic location that made some sense under the circumstances. All my friends and colleagues have always known that my wife Ruth and I were Estonians, but only the Europeans know where Estonia is, and what kind of a country it is. For most Americans and Canadians, Estonia is as easily confused with Ethiopia as the Baltics are confused with the Balkans. So, if we were going to have a different kind of a meeting, why not have it in a place where our friends would learn a little bit of geography, perhaps even history? Since many of the participants had never heard of Tallinn and most had never visited there before, the locale itself was going to help to make the occasion memorable. From my own point of view, the fact that the timing of the conference conveniently happened to coincide with my 71st birthday added another bit of personal relevance. I usually do not celebrate my birthdays, and therefore do not have memories of any past ones. The 71st in Tallinn was to be and indeed now is an exception.

Who were the participants? The pre-conference public announcement stated grandly that, "The invited participants include some of the world's best known cognitive brain scientists from North America and Europe who have greatly contributed to our understanding of memory as a rela-

tion between the brain and the mind, together with a number of highly promising younger researchers in the same field." The statement, of course, is not totally wrong, but for obvious reasons does not say everything. An assertion even closer to the absolute truth is that the invited participants were all my friends, colleagues, and ex-students, from various times and various places. Ten came from the US, ten from Canada, three from UK, two each from Estonia, Germany, and Sweden, and one from France. Several others who were invited could not make it to Tallinn, but two of them, Eric Eich and Morris Moscovitch, did end up contributing to the present volume. Every one of these participants in the venture has been my scientific collaborator in one fashion or another! I know every one personally, and, with one exception, every one has been a guest in our home in Toronto at one time or another. Finally, and perhaps most interestingly, fourteen of them are now, or have been in the past, directly associated with the Rotman Research Institute of the Baycrest Centre. One could therefore think of the conference as a Rotman/Baycrest Conference in Tallinn!

I also invited two special guests, although neither is an official aficionado of the topic of the conference. Jaan Puhvel, a Professor Emeritus of Classics and Indo-European Languages at UCLA, who spends his summers in Tallinn and thus "happened to be around anyhow," kindly consented to tell our assembly of working scientists of memory, consciousness, and the brain about the origin of the terms designating their love objects in English. His wonderful original essay on the topic, included in this volume, does not only throw light on the terms of the conference's and the book's trinity, but also shows how close our predecessors came to calling psychology "thymology."

The second special guest, Robert Sternberg, is an old young friend who is not quite as keen on memory, or brain, or consciousness as he is on intelligence, creativity, and love. But he had told me once that he always wanted to visit Estonia, and so I invited him to time his visit, with his wife Alejandra, to coincide with our meeting. I even suggested a topic to him to talk about: "Does intelligence require memory?" He graciously declined that unimaginative assignment, and instead decided to tell us a cautionary tale about the greatest, or at least the second-greatest, enemy of scientific progress, namely *confirmation bias*: scientists, being mere mortals, have been programmed by the biological evolution to hate the idea of being wrong. This is why an inordinate amount of effort goes into demonstrating again and again, for the thousandth time, that something we have known for a long time is still so. Sternberg illustrates this profound science-psychological principle by a case study of the issue of what is intelligence, how it can be measured, and for what purpose. But the same

principle applies in all other sciences, including of course the science of memory, consciousness, and the brain.

In addition to the main group of invited speakers, there was a small coterie of 'observing guests' who took part in all or some of the proceedings. They included Merry Bullock, Jaanus Harro, Kairi Kreegipuu, Nancy Lobaugh, Walter Mischel, Gun Nilsson, Anu Realo, Kurt Roediger, Rebecca Roediger, Mary Schiller, Bertelle Selig, Aaro Toomela, Linda Tulving, and Aune Valk.

Why did we want to publish a book based on such an esoteric meeting? Well, we did not, but the rules of the bigger world being what they are, it would have been difficult not to. Most people paid for travel to Tallinn out of their own or their institutional research grants. Granting agencies naturally are suspicious of anyone who gallivants to places such as Thailand (as one of our participants initially thought he had been invited to!) or Tallinn under the pretence of "doing science." The agencies need proof that at least some science in fact got done. This book provides the needed evidence. To make sure that even the hard-nosed auditors of the participants' research accounts have no reasons to question the undertaking, we went to the double trouble of taking a group photograph in Tallinn. (This is supposed to be a joke. I am saying it to be helpful. The standards of funniness are rapidly changing in today's world.)

What is in the book? The contents of the book, as already mentioned, are the product of the free will of the individual participants, and for that reason are not easily summarized. In this respect, this edited book differs little from hundreds of others of the genre. Every single chapter, of course, has to do with a smaller or larger part of our trinity of memory, brain, and consciousness. The editor's duty was to impose some apparent structure on the collection, ideally one that makes sense. However, because science is never organized linearly whereas the contents of books are, this mission turned out to be impossible. Instead, the chapters are simply lined up in three main sections that bear the labels of individual terms of the trinity. At the beginning there is a Prologue, and at the end, for balance, an Epilogue.

Although the organization of the book is largely illusory, there does exist a difficult-to-detect gradient from more purely traditional psychological approach to memory (no consciousness, no brain) to a greater emphasis on the structure and function of the brain that transcends the narrower confines of memory and consciousness. Some people have not yet embraced the brain in their mind-science endeavours—they qualified for invitation to Tallinn by the milder requirement that no one there be afraid or disdainful of the brain—and their work is classified under memory. Others, more adventurous by the standards of mainstream psychology,

have their contributions placed closer to the brain. The “brain” of our conference and this book, in any case, is not the three pounds of 100 billion neurons and a trillion other cells in an agitated state of exchanging electrochemical gossip, but rather an intricately organized structure of “centers” interconnected by “pathways” whose “activation” is correlated with psychological functions.

Is there any justification for this book other than gratifying granting agencies? Psychologists, being people who can always explain everything and justify anything, I can think of at least two.

The better of the two is this: Think of the book as source material for a history of science student in 2999 who desperately wants to write something original, and has difficulty finding a topic, because everything of any importance of any kind has been covered a hundred times from ump-teen angles. So, this student, after exhaustively searching through the totality of the virtual universal COSMONET and finding nothing that is useful, accidentally hears that there is something called The Archives of Memory, a real building where they keep old-fashioned records on paper. She decides to pursue that lead. So she finds the mausoleum-like building in what used to be the City Center of Akron, Ohio. It consists of 24 mostly open floors, 20 below the ground, four above, each 40 by 40 meters, filled with rows upon rows of plastic shelves on which sit all kinds of weird-looking objects. Books, she is told. The whole building is temperature-controlled, humidity-controlled, radiation-controlled, magnetism-controlled, asbestos-controlled, pollen-controlled, illumination-controlled, virus-controlled, and mold-controlled, and visitors have to don two-way protective garbs and face masks before they are permitted in. By a stroke of sheer luck, after spending two and a half days perusing the catalogues of the Archives, she stumbles upon the reference to the present volume. It looks different from all others, because it has a picture of a group of funny-looking people on the cover, and that makes her curious. She goes and retrieves it, reads it, finds it unbelievably archaic and yet so charmingly quaint, and decides to write her original essay about her discovery, under the title of “Three Days in the Lives of Memory, Consciousness and the Brain People in the Lower Early Middle Epoch of the Neuro-mindsciences.” Voilà! Welcome, time traveller from the future! Enjoy!

An alternative justification for the book might be the following. Imagine that right now, in the present world, you teach cognitive neuroscience. One day a graduate student of physics comes to you and addresses you as follows: “Hi, there! Can I ask you something? I have figured out that physics has had it. Neutrinos is the only interesting thing left, but too many people are working on that already. My supervisor, after the fourth beer at last Friday’s happy hour, let it slip out that smart money is now on biology. I myself think that, because my supervisor is getting old, and

because it is known that smart money always lags behind the times, there must be an even brighter future somewhere else. So I decided that it might be the study of things like memory and consciousness in the brain that is going to be the cool science of the future. Can you suggest a short and easy but thorough and comprehensive read on what people are doing right now in relation to these obscure topics?" You congratulate the young man on his excellent frontal lobes, and inform him that although there does not exist anything that corresponds precisely to his oxymoronic expectations, there does happen to exist a volume that contains a representative if not a perfectly unbiased sample of recent research done at the interface of what he is talking about. Voilà! Welcome, lucky searcher for the growth sciences of the future!

Many individuals provided support and encouragement for the conference and helped with various aspects of its organization. I am deeply grateful to them all.

The Baycrest Foundation and the Rotman Research Institute of Baycrest Centre kindly sponsored the conference and facilitated financial arrangements. Especially essential was the support offered by Dr. Elaine Todres, Director of the Baycrest Foundation, and Dr. Donald Stuss, Vice President of Research of Baycrest Center and Director of the Rotman Research Institute.

At the opening ceremony of the conference, the President of the Estonian Academy of Sciences, Professor Jüri Engelbrecht, brought friendly greetings from the Academy and personally delivered a warm welcome. The Prime Minister of Estonia, Mart Siimann, whose academic background happens to be in the field of psychology, sent a dignified, beautifully crafted, and most thoughtfully composed official 'Letter of Welcome' that was read at the opening and appreciated by all the conferencees.

The Canadian Ambassador to Estonia, the Honorable William Clark, had invited all the participants of the conference and their guests to a reception at the Canadian Embassy. Although he himself was away from Tallinn at the time, Mr. Gerald Skinner, Charge d'Affaires, together with Mrs. Marina Asari and other members of the staff of the embassy, acted as most graceful hosts to the group. This event must have been particularly memorable to all due to the spectacular locale of the embassy in the most ancient part of Tallinn, high on the cliffs of Toompea.

Our Guest of Honor at the closing banquet was the Foreign Minister of Estonia, Toomas Hendrik Ilves, himself no stranger to psychology. He gave an illuminating account of the then acute discussions concerning Estonia's aspirations for membership in the European Union. His presence and presentation was greatly appreciated.

My deepest thanks go to my wife Ruth, the co-organizer of the conference. Her spirited support of the idea of the conference from its inception

several years ago, her energetic and decisive help in the extensive communications with the various participants, her organization of two sightseeing tours—one in Tallinn, the other, after the conference to St. Petersburg, Russia—and her meticulous and painstaking attention to the many details of making sure that “our guests in Tallinn” would feel pleased and happy, made all the difference to the greatness of the venture, not only in the opinion of her co-organizer, but in that of all other participants as well.

The Natural Sciences and Engineering Research Council of Canada has supported my research continuously since 1958, and the Anne and Max Tanenbaum Foundation has done so over the last eight years. Without their support there would have been no Tallinn Conference, and no present book.

Finally, I would like to express my most heartfelt gratitude to all my friends and dear colleagues who, with great enthusiasm, responded to the clarion call to gather in Tallinn for the stated purpose, and who converted an untried venture into what everyone modestly agreed was a “smashing success.” Every single one of these friends and colleagues has changed my life, at one time or another, and in one way or another, and always toward the better. I am glad that Tallinn made it possible for me to express openly my deep appreciation of their friendship and collegiality.

At the end of it all, an especially pleasing thought has occurred to me: Due to the novelty and uniqueness of the venue of the conference, none of those who were there will probably ever forget it. If so, our little conference constitutes further proof that novelty is one of the most important determinants of the goodness of auto-noetic remembering, one of the many ideas discussed in the book.