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**Opening Extract from...**

# This is Improbable

Cheese String Theory, Magnetic Chickens, and other WTF Research

Written by Marc Abrahams

Published by Oneworld Publications

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# THIS IS IMPROBABLE

Cheese String Theory, Magnetic Chickens,
and Other WTF research

Marc Abrahams



**A Oneworld Book**

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# THIS IS IMPROBABLE

ONE

# STRANGE IN THE HEAD

## IN BRIEF

**'MY GRANDMOTHER'S PERSONALITY: A POSTHUMOUS EVALUATION'**
by Frederick L. Coolidge (published in the *Journal of Clinical Geropsychology*, 1999)

*Some of what's in this chapter: Thinking, to the brink of medical danger • Spotting hairy heads in theme parks • Being bored for His Majesty • Playing on, whilst being watched • Being brain damaged, for better wagering • Fingering beauty for intelligence • Heading up* Brain *• An Alias for body hair • Praying, to the brink of madness.*

## YOUR MIND COULD KILL YOU

Exactly how dangerous is it to think? The question matters, because for some people it truly is dangerous – physically, life-threateningly dangerous.

This question also bears on one that's seemingly unrelated: is it dangerous for students to use a calculator, rather than do maths in their heads?

In 1991, researchers in Osaka, Japan published a report called 'Reflex Epilepsy Induced by Calculation Using a "Soroban", a Japanese Traditional Calculator'. (The English word for *soroban* is 'abacus'.) The report describes an unfortunate young man who 'entered college in 1980, where he belonged to a music club and was in charge of the drums. After six months, he felt intense psychological tension during drum playing and particularly when he had to write musical scores

phrase after phrase while listening to the music recorded on tape.' The situation worsened. Writing musical scores sometimes induced generalized tonic-clonic convulsions. The man truly suffered for his music.

In his final year at university, he discovered that doing calculations on an abacus caused the same problem, with even more severity. He stopped using an abacus, and started seeing doctors.

Specialists have seen and reported other such cases.

Consider the disturbingly thought-provoking paper entitled 'Seizures Induced by Thinking'. The report was published by A. J. Wilkins and three colleagues at the University of Essex in the *Annals of Neurology* in 1982. The researchers describe a man who suffered convulsions whenever he performed certain kinds of mental arithmetic. This was pure mental calculation, without the complication of an abacus or other mechanical or electronic apparatus. Mental addition seemed harmless enough for this man, and so did mental subtraction. But whenever he tried doing multiplication in his head, it triggered seizures. Division was equally a danger.

Other cases on record hint that subtraction is not always as safe as it seems, at least not for absolutely everyone. Nor is addition.

Mathematics and musical composition are not the only hazardous mental activities. A team at St Thomas' Hospital in London documented the plight of seventeen people who must watch what they watch. For them, the act of reading can trigger seizures. Newspapers are dangerous. Books are dangerous. Perilous materials are everywhere. There are also people for whom the act of writing is dangerous.

So, in reading, in writing, in arithmetic, and in other kinds of thought, true dangers lurk. They are exceedingly rare. At least, that's what the doctors say they think.

Wilkens, A. J., B. Zifkin, F. Andermann, and E. McGovern (1982). 'Seizures induced by thinking.' *Annals of Neurology* 11: 608–12.

Yamamoto, Junji, Isao Egawa, Shinobu Yamamoto, and Akira Shimizu (1991). 'Reflex Epilepsy Induced by Calculation Using a "Soroban", a Japanese Traditional Calculator.' *Epilepsia* 32: 39–43.

Koutroumanidis, M., M. J. Koepp, M. P. Richardson, C. Camfield, A. Agathonikou, S. Ried, A. Papadimitriou, G. T. Plant, J. S. Duncan, and C. P. Panayiotopoulos (1998). 'The Variants of Reading Epilepsy. A Clinical and Video-EEG Study of 17 Patients with Reading-Induced Seizures.' *Brain* 121: 1409–27.

## COMBING THROUGH THE DATA

Clarence Robbins and Marjorie Gene Robbins visited theme parks hoping to find a good, representative mix of hairy-headed strangers. They then wrote 'Hair Length in Florida Theme Parks: An Approximation of Hair Length in the United States of America'. The study tells how Robbins and Robbins gathered their data, combed through it, and extrapolated the strands to gain a new understanding of America.

At the time of their investigation, Robbins and Robbins were the leading researchers at Clarence Robbins Technical Consulting, a think tank located in their home in Clermont, Florida. Clermont is just a short drive from four big theme parks – Epcot, Universal Studios, the Magic Kingdom, and MGM Studios. In visiting those parks, the researchers set themselves a simple, clear goal: 'to obtain data on the percentage of persons in the US with different lengths of scalp hair'.

The goal was not so easily attained. Robbins and Robbins found it prudent to make two additional theme park visits specifically to address questions pertaining to accuracy.

The first extra visit was to 'determine whether or not any hairstyles might interfere with or affect our estimates on free-hanging hair length'. This proved susceptible to an easy statistical adjustment.

The other visit was to 'determine whether or not any headcovers' – by which they meant caps, hats, and scarves – would skew the estimates. They decided, happily, that headcovers cause no such problems.

Robbins and Robbins could not, of course, ensure that their hairy-headed sample accurately represented the entire American populace. But the monograph tells how they tried: 'In an attempt to try to determine how this population relates to the general US population, several telephone calls were made to the Walt Disney Corporation, including their Market Research Department. Those contacted refused to provide any helpful information, indicating that their data and results were proprietary.'

The Robbins–Robbins study, though technical in nature, also presents facts that may be enlightening to laypersons: 'One woman who

was observed at Epcot had hair reaching several centimeters past her buttocks. She was dressed in a skintight costume, as were two young men walking with her shortly after a Disney parade. She had curly blonde hair and appeared to be in her mid to late 20s. This woman was most likely a Disney employee, hired for her long hair, because we observed her once before in a Disney parade playing Rapunzel.'

The report, published in the *Journal of Cosmetic Science*, concludes with a compelling summary: 'By observing the hair of 24,300 adults in central Florida theme parks at specified dates from January through May of 2001 and estimating hair length relative to specific anatomical positions, we conclude that about 13% of the US adult population currently has hair shoulder-length or longer, about 2.4% have hair reaching to the bottom of the shoulder blades or longer, about 0.3% have hair waist-length or longer, and only about 0.017% have hair buttocks-length or longer. Hair appreciably longer than buttock-length was not observed in this population.'

Robbins, Clarence, and Marjorie Gene Robbins (2003). 'Scalp Hair Length. I. Hair Length in Florida Theme Parks: An Approximation of Hair Length in the United States of America.' *Journal of Cosmetic Science* 54 (1): 53–62.

## TRUTH ON THE SIDE

On which side lies the truth? It's on the left, according to a 1993 study published in the journal *Neuropsychologia*. The left ear, this study says, is better than the right ear at discerning truth. Slightly better. In most people. Some of the time.

The experiment, called 'Hemispheric Asymmetry for the Auditory Recognition of True and False Statements', was conducted by Franco Fabbro and his team at the University of Trieste. Twenty-four men and twenty-four women each donned headphones, and then (presumably) followed these instructions: 'In the headphones you will hear phrases pronounced by four people you don't know. There are two types of phrase – "This is a pleasant photo" and "This is an unpleasant photo". While they pronounced these phrases they were looking at photographs which they had previously judged to be pleasant or unpleasant. Sometimes they are telling the truth. Sometimes they are lying. After hearing a phrase you have to decide whether you think the speakers are telling the truth or a lie.'

The effect is subtle. According to the data, the left-ear truth detector is not especially good at recognizing women's lies. It works, to the extent it works, only when a man does the lying. Even then, it correctly recognizes only sixty-three percent of the true statements as being true.

Fabbro and his colleagues were intrigued by the two cerebral hemispheres. One is thought to be more skilled than the other at handling emotions. 'Most people undergo an increase in emotional stress when telling a lie', the study says. The theory, too, is subtle. Fabbro and his colleagues phrase it this way: 'Since in human cultures lying prevailingly occurs at the verbal level, it is reasonable to expect a stronger tendency to consider false that kind of information which is transmitted and processed through verbal systems. For the same token it is reasonable to expect a stronger tendency to consider true the information which is processed by non-verbal systems.'

A different experiment, conducted more than a decade earlier at McGill University in Montreal, Canada, looked for something less subtle. And found it.

Walter W. Surwillo told all in his study called 'Ear Asymmetry in Telephone-Listening Behavior', which was published in the journal *Cortex*. He, too, was curious about the powers of the left ear versus the right. Surwillo surveyed people whose jobs involve a lot of telephoning, and also people whose jobs don't. His question: which ear do they prefer for listening on a telephone?

The results: 'Listening with the left ear was associated with heavy use of the telephone. The most frequently given reason for listening with the left ear was that it freed the right hand for writing and dialing. This preference would appear to be motivated by convenience for although either ear is available for listening, it is easier to hold the receiver to the left than the right ear while grasping it in the left hand.'

For further elucidation of the relative power of the left and right ears, you may wish to consult a study of 203 telesales staff examining the relationship between ear preference, personality, and job performance ratings. Those who preferred a right ear headset generally rated higher in supervisors' eyes when it came to actual performance

and developmental potential compared to those staff who preferred a left ear headset.

Fabbro, F. B., B. Gran, and A. Bava (1993). 'Hemispheric Asymmetry for the Auditory Recognition of True and False Statements.' *Neuropsychologia* (31) 8: 865–70.
Surwillo, Walter W. (1981). 'Ear Asymmetry in Telephone-Listening Behavior.' *Cortex* 17 (4): 625–32.
Jackson, Chris J., Adrian Furnham, and Tony Miller (2001). 'Moderating Effect of Ear Preference on Personality in the Prediction of Sales Performance.' *Laterality: Asymmetries of Body, Brain, and Cognition* 6 (2): 133–40.

## IMPERIAL BOREDOM

True, at its height, the British Empire produced magnificent heaps of wealth and power. But according to historian Jeffrey Auerbach, the empire also generated staggering amounts of boredom.

In a copiously documented report in the journal *Common Knowledge*, Auerbach writes: 'Throughout the nineteenth century and into the twentieth, British imperial administrators at all levels were bored by their experience traveling and working in the service of king or queen and country. Yet in the public mind, the British empire was thrilling – full of novelty, danger, and adventure, as explorers, missionaries, and settlers sailed the globe in search of new lands, potential converts, and untold riches.'

Auerbach's interests are not limited to boredom. An assistant professor of history at California State University, Northridge, he has published on many other subjects, among them 'The Homogenization of Empire', 'The Monotony of Empire', and the inspirationally titled 'The Impossibility of Artistic Escape'.

The imperial boredom report is filled with telltale evidence of administrators' boredom. Those administrators range from the soon-to-be celebrated Winston Churchill (who at age twenty-one wrote that Indian life was 'dull and uninteresting') to the clerk who wrote this ditty:

*From ten to eleven, ate a breakfast at seven;*
*From eleven to noon, to begin 'twas too soon;*
*From twelve to one, asked 'What's to be done?'*
*From one to two, found nothing to do;*
*From two to three, began to foresee*
*That from three to four would be a damned bore.*

Auerbach complains that, for generations, 'Scholars have by and large perpetuated [a] glamorous view of the empire, portraying imperial men either as heroic adventurers who charted new lands and carried "the white man's burden" to the farthest reaches of the planet or as aggressors who imposed culturally bound norms and values on indigenous peoples and their ways of life.'

He says he did his research by 'reading against the grain of published memoirs and travel logs' and by digging into the unspectacular mutterings of private diaries and letters. His task was the more difficult, he argues, because 'if people felt bored before the mid-eighteenth century, they did not know it'. This view of boredom, he points out, was persuasively developed by Patricia Meyer Spacks, whose 304-page book *Boredom: The Literary History of a State of Mind*, titillated thrill-starved scholars in 1995.

Auerbach is himself writing a book. It's about imperial boredom. He will need to expand considerably upon his current study, which is twenty-three pages long and includes only seventy-six footnotes. As this book – the one you are reading – goes to press, Auerbach's book has not yet hit the market. His website lists it as *Imperial Boredom: The Banality of the British Empire, 1757–1939* (in progress).

Perhaps, though, Auerbach has already done his finest work. Here, in just forty-seven words, is his take on imperial boredom: 'The reality simply could not live up to the expectations created by newspapers, novels, travel books, and propaganda. As a consequence, notwithstanding some famous exceptions, nineteenth-century colonial officials were deflated by the dreariness of their imperial lives, desperate to ignore or escape the empire they had built.'

Auerbach, Jeffrey (2005). 'Imperial Boredom.' *Common Knowledge* 11 (2): 283–305.

## 28 STRAIGHT HOURS OF VEXATIONS

German and Austrian researchers analysed what happened to pianist Armin Fuchs when he spent more than a full day playing over and over again, nonstop, an oddly named piece of music by a French composer. They also analysed what happened to the music. This was a tour de force of artistic and neurological repetition.

The research team – Christine Kohlmetz, Reinhard Kopiez, and Marc Bangert of the Hanover University of Music and Drama, and Werner Goebl and Eckart Altenmüller of the Austrian Research Institute for Artificial Intelligence, in Vienna – published a pair of monographs in 2003 describing what they measured in the pianist.

The study titles, like the performance, are lengthy. One, in the journal *Psychology of Music*, includes the phrase 'Electrocortical Activity in a Pianist Playing "Vexations" by Erik Satie Continuously for 28 Hours'. When Satie composed the piece in 1893, he added an instruction that the performer should: 'play this motif 840 times in succession'.

Twenty-first-century researchers Kohlmetz, Kopiez, Bangert, Goebl, and Altenmüller explicitly question whether nineteenth-century composer Satie 'was aware of the effect his work might have on a pianist, especially with regard to his or her consciousness and motor function'.

Do the maths and you'll see that Fuchs, the intrepid piano player, averaged thirty performances per hour. That's a lot of 'Vexations', in two-minute-long chunks.

| Time | d [hr] | Protocol of spectator | Protocol of pianist (AF) | State |
|---|---|---|---|---|
| 9 am–5 pm | –8.00 | | Got up, breakfast, preparation in concert hall, interview, setting electrodes for EEG, kinesiologic exercises | |
| 5 pm | 0.00 | **Beginning of performance** | No chance to concentrate before the beginning | **Alertness** |
| 6 pm | 1.00 | | | 0.10–2.10 hr |
| 7 pm | 2.00 | | Relaxed state of mind | |
| 8 pm | 3.00 | | | |
| 9 pm | 4.00 | | First complaints (pain in shoulder, clavicula) | |
| 10 pm–3 am | 5.00–10.00 | | | |
| 4 am | 11.00 | First meal, first cigarette | Extremely tired, hard to concentrate | |
| | 11.25 | **Signs of beginning trance** | Better after smoking | |
| 5 am | 12.00 | | | |
| 6 am | 13.30 | 2nd cigarette, mixes up passages, stops to measure | Approx. 6.30 am **beginning of trance**, felt extremely tired, | |

**Detail from table: 'Event protocol of the performance recorded by an observer and retrospectively by the pianist'**

By affixing wires to Fuchs's head and using an electroencephalograph (EEG) to continuously monitor gross electrical activity in his brain, the researchers discovered that 'the pianist experienced different states of consciousness throughout the performance ranging from alertness to trance and drowsiness'.

Fuchs's playing grew inconsistent during the periods of drowsiness. But when alert, the man was a model of consistency. 'Most importantly', says the study, 'whilst in deep trance, which included effects such as time-shortening, altered perception and characteristic changes in the EEG, the pianist managed not only to keep on playing but also to maintain a constant tempo, hence executing complex motor schemes at a high level of performance.' (For a video of the performance in progress, visit http://www.youtube.com/watch?v=km9GiejF5OQ.)

The second study, published in the *Journal of New Music Research*, gives a much finer-grained 'tempo and loudness analysis'. It boasts that 'non-linear methods revealed that changes in loudness and tempo are of a highly complex nature, and both parameters unfold in an 18-dimensional space. This has never before been demonstrated in performance research.'

'Vexations' is not one of Erik Satie's most beloved compositions, not yet anyway. Although brief (when played, contrary to instructions, just a single time), it meanders along in a way that's neither quick nor catchy.

But Satie pioneered something of value – the technique ('play this motif 840 times') that the music business would refine many years later, with significant payoff. Radio disc jockeys demonstrated in the 1950s that, by persistently, diligently repeating a song, they could ensconce it into the minds of many listeners, who would ever after believe it to be one of their favourite tunes.

Kohlmetz, Christine, Reinhard Kopiez, and Eckart Altenmüller (2003). 'Stability of Motor Programs during a State of Meditation: Electrocortical Activity in a Pianist Playing "Vexations" by Erik Satie Continuously for 28 Hours.' *Psychology of Music* 31 (2): 173–86.
Kopiez, Reinhard, Marc Bangert, Werner Goebl, and Eckart Altenmüller (2003). 'Tempo and Loudness Analysis of a Continuous 28-Hour Performance of Erik Satie's Composition "Vexations".' *Journal of New Music Research* 32 (3): 243–58.