

Perspectives ON MAGIC

SCIENTIFIC VIEWS OF THEATRICAL MAGIC



Peter Prevos

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Preface

WHY THIS BOOK?

For as long as I can remember, performing magic has been a part of my life. To be more precise, I am an occasional conjurer and use sleight-of-hand and other forms of deception to feign being a real magician. I started adding magic to my life as a schoolboy in the Netherlands. I devoured books from the local library, collected magic sets from the toy shop, and constantly attempted to amaze friends and family. My passion for magic was unrelenting in those early years, and I showed magic tricks to anyone who was interested and, in my enthusiasm, also to those who were not. I performed in many local talent contests and at family birthday parties and even some paid performances. Magic was, however, not the career I chose to follow.

After completing an engineering degree I took on a job that allowed me to travel to exotic places where communication was often complicated by language barriers. In those situations, magic tricks and balloon animals were the perfect tool to overcome these barriers and make instant friends. Soon after I started my career I achieved my personal goals in engineering and began a degree

in philosophy to study the mysteries of existence. Because of all the serious thought involved with this study, I became disillusioned with the triviality of magic. I was no longer able to see the meaning of conjuring beyond the mundane trickery and clichés employed by magicians.

Much of magic has a “look at me” aspect, and it can be an egocentric performance art. In retrospect, I was disillusioned because at that time I did not have sufficient insight to move beyond the stereotypes. As such, I replaced my passion for magic with a passion for philosophy and completed a degree in this subject. It was only years later that I realised that my interest in philosophy was actually strongly related to my interest in magic, and that magic is an inherently philosophical performance art. I read some books on the history of magic which described the connection between magic tricks and divination and other esoteric practices. I began to realise that the ancient shaman, the tribal philosopher, was also a conjurer, a master of sleight-of-hand.

A magic performance is in essence a theatrical experience that challenges reality as we know it, which is an inherent philosophical quality. Magic challenges the mind in a way that no other performance art can. My passion was rekindled when I discovered the works of Jay Sankey, Tommy Wonder, Eugene Burger and Jeff McBride, some of the magicians that inspired me the most. Their work displays a passion and a philosophical understanding of theatrical magic that takes it beyond mere trickery. Reading their books and watching their videos renewed my enthusiasm for this quaint performance art.

I still occasionally perform magic shows, but now my main interest in magic stems from what it can teach us about ourselves and about the world around us. My passion for academic research has

never waned, and at the time of completing this book I am a PhD candidate at La Trobe University in Melbourne, researching organisational culture and customer service. Being a graduate student provides me access to the ivory tower of academia and its immense knowledge networks. During my research I discovered an article by professors Terence Krell and Joseph Dobson from Western Illinois University, advocating the use of magic tricks to teach theories of organisational behaviour. This started me on a quest to establish an annotated bibliography of scientific and professional literature related to conjuring. To my pleasant surprise I uncovered a vast number of journal articles and scholarly books that discussed magic from many different perspectives. Studying magic scientifically started at the end of the nineteenth century with psychology experiments. The last few decades there has been a renaissance of scholarly research into magic, with publications in many different fields of science.

The idea to write this book came to me when I discovered that anyone not formally associated with academia can be charged more than thirty dollars to purchase a short article from an academic journal. This places access to much academic knowledge outside the reach of most people. It is unfortunate that the collective knowledge of the world is locked up behind ironclad copyright contracts and is not available freely to the taxpayers who funded much of this research. Another motivation to write this book is that science is sometimes just as esoteric as magic. Scientific knowledge is often shrouded in an obscure language that is only comprehensible to those initiated in its traditions, and each field of science is a subculture with its own language and methods. The main purpose of this book is to unlock the literature on theatrical magic to non-scientists who are interested in this ancient performance art. My objective in writing this book is to show that theatrical magic has much to offer

beyond frivolous entertainment. This book is an attempt to unlock the professional and scientific literature on conjuring for those with an interest in deceptive theatre.

In order to provide a broad understanding of the art of conjuring, this book contains the collective musings of a wide range of professionals and academics, including teachers, psychologists, occupational therapists, mathematicians, and sociologists. Magic tricks are used by health care professionals to aid them in rehabilitation programs, by teachers to illustrate principles of science, and by psychologists to better understand how the mind works. Magic research also provides a unique perspective on cultural history, and in recent years there has been a steady stream of scholarly works interpreting the role of magicians in society. Studying this extensive collection of literature about magic has uncovered many interesting insights into magic, its past, present and possible future as a performance art.

Given the variety of scientific subjects covered in these pages, this book is also an enquiry into the nature of science itself. The research described in this book shows that there is no such thing as *the* science of magic but that artful deception can be investigated from many diverse angles of human enquiry, ranging from the humanities and psychology to software engineering and nursing. My journey through the wide variety of literature available on this subject taught me that only a multidisciplinary study can provide a meaningful understanding of a social phenomenon such as magic. Each field of intellectual endeavour provides a unique perspective on magic as an art form, as a psychological curiosity or as a means to achieve practical goals beyond entertainment.

In contrast to most other books about magic, this book does not contain any descriptions of how to perform magic tricks. There are no explanations of new ‘moves’ to make a card change from black

to red, no ‘sleights’ to make a coin disappear, like is usually the case in books about magic. One chapter is dedicated to *why* magic tricks work, but not discuss any details on *how* they work. This book has been written for both experienced magicians and people with only a passive interest in magic. My aim is to provide magicians with a deeper understanding of their craft and to inspire them to keep evolving the performance of magic. For people with only a passive interest in magic, this books aims to provide insights into a quaint performance art that is generally surrounded in secrecy and muffled by clichés, without breaking the magician’s code.

Magic and science have in common that they both are driven by questions. The inherent nature of scientific research means that with every answer many new questions arise. It is my hope that this anthology of the existing literature on the science of conjuring will raise new questions and spawn further research into this fascinating performance art.

Peter Prevos, Kangaroo Flat, May 2013.

Acknowledgements

WHO HELPED ME WRITE THIS BOOK?

This project has taken me almost four years to complete and would have been impossible to publish this book without the help of others. I owe a gratitude to the many scholars in different fields that have taken the effort to publish papers and books on a niche subject such as theatrical magic. I also need to acknowledge the many anonymous subjects of experiments conducted by psychologists and occupational therapists. They are the unsung heroes of some of the research described in this book.

My magician friends from Melbourne and overseas have been very supportive during this long project, and although many may have wondered whether this book would ever be published, their continued interest is what sustained my motivation to keep working on this book. Thanks to Tom Stevens for his permission to use one of his Facebook updates. Also, a special mention for Alex de la Rambilje, who gave me invaluable feedback on my thoughts about magic and let me use his university thesis on the theatrical aspects of magic performance. The invaluable feedback provided by magicians Nicholas, *The Honest Con Man*, Johnson, Gary Co-

hen and Brendan Croft, all from Melbourne, and Tony Barnhart, a cognitive scientist and magician from Phoenix, and Fritz (with a Z) from Amsterdam, kept me motivated to continue working on this project. Also a word of thanks to my wife Sue, who was so kind to proofread the text and had to endure conversations with me from behind a laptop screen.

This book was edited by Marissa van Uden, my secret weapon in completing this project. It is only through her insightful feedback and critical reading of my drafts that I was able to transition an otherwise tedious annotated bibliography into a readable book. Lastly, my thanks to Susan Hobbs of Pair of Aces Design for her patience with me in designing the cover for this book and the artwork for the associated website.

Chapter 1

Introduction

WHAT IS MAGIC?

The magician introduces three cups and three balls. Using a magic wand, he commands the balls to dematerialise from his bare hands and rematerialise under the cups. The balls seem possessed by supernatural powers as they appear, disappear and penetrate solid matter at the mere whim of the magician. This supernatural choreography ends with pieces of fruit appearing under the cups where the balls once were. The spectators applaud after witnessing this ancient miracle. Although they are impressed and entertained, a nagging thought lingers in their minds: *How did he do it?*

Among the spectators is a group of university colleagues who reflect on what they just experienced. They enjoyed the show as much as everyone else, but they have very different questions than the rest of the audience. The psychologist wonders how it is possible that his mind was so easily deceived by the performer. How can it be that we are tricked to be seeing something that contradicts our com-

mon sense view of the world? The psychologist's friend, a professor in humanities also enjoyed the show. She wonders how the fruit appeared under the cups, but also ponders the cultural significance of magic and the reasons it has remained popular for millennia and across different cultures. Her husband, who works as an occupational therapist at the local hospital, is also an amateur magician. He contemplates the incredible hand-eye coordination and muscle control required to perform the trick he just saw, and he wonders if magic tricks could be used in occupational therapy. Meanwhile, another magician sitting in the back of the room has a very different perspective. Although she is fully aware of how the performer directed the attention of the spectators and used sleight-of-hand to create the illusion of magic, she was nevertheless impressed and entertained by the performance, in particular by the flawless execution of the *Vernon Wand Spin* and other technical manoeuvres. She is even more impressed by how the performer was able to hold the spectator's attention with his beautifully executed choreography and enthralling presentation.



This anecdote illustrates how the performance of magic tricks can have very different meanings to different spectators, depending on their personal perspective. It also shows that the question of *how* a magic trick is done and what specific techniques have been used to create illusions is only one of many questions that may be raised in the minds of the audience during a magic performance. In the following chapters, we will explore the many facets of conjuring and discuss the many questions raised by scientists and professionals from diverse areas of expertise. But before we can delve into their research, we need to define what it is that magicians actually do and review the different interpretations of what constitutes magic.

The relationship between magic and science is a complex one. On the one hand they are considered each other's opposites, while on the other hand they can be seen as stages in a continuum of human knowledge. The word 'magic' is usually reserved for anything that contradicts what we consider to be the laws of nature. Some adopt a less confrontational view and think that the difference between magic and science is related to a lack of knowledge. This confusion is at least partly created because the word 'magic' can be used in different ways. The meanings of words, especially those ingrained in the cultural fabric of society, evolve as the values that underpin the culture change. Magic is, in the words of philosopher Walter Galile, an *essentially contested concept*: terms that describe a complex aspect of humanity (such as 'culture' and 'religion'), that are laden with value and whose meanings can be debated at length without a final definition ever being agreed upon.

There are three ways of looking at essentially contested concepts such as magic. The *dogmatic* view places magic in diametrical opposition to science. A belief in magic is usually seen as a rejection of science and vice versa, thinking scientifically as a rejection of magic. This is the view of many scientists who use the term 'magical thinking' to refer to theories that are contrary to the principles of scientific thinking, such as astrology and homoeopathy. In the *sceptical* point of view, no claim to truth is made, and magic and science are seen as equally subjective personal perspectives. It should be noted that the philosophical use of the word 'scepticism' in this context is different to that used by the many sceptic societies. In philosophical scepticism, all claims to truth are considered equally invalid, both magical and scientific. The popular sceptic societies, such as the Committee for Skeptical Inquiry or the Skeptics Society, are not philosophically sceptical as they only question paranormal theories

and assume the primacy of science. However, neither the dogmatic view nor the sceptical view is insightful regarding the relationship between magic and science. Both lead to either diametrically opposed views, where one side aims to annihilate the other, or to nihilistic views devoid of all meaning. Gallie's third option, an *eclectic* view of magic, gives credence to both magic and science as valid aspects of the human experience and as ways to make sense of the world. In this interpretation, magic and science don't compete with each other but are complementary world views. The eclectic view is more productive because using value judgements for either science or magic prevents a full understanding of magic as a phenomenon of human culture. Magic has always been an integral part of human culture; it still plays an important role and will, despite advances in science, continue to do so in the future. What is perceived to be either magical or scientific will, however, change continuously along with cultural perspectives.

The discourse on science versus magic is complicated by the fact that the word 'magic' itself is deceptive. This simple word can be used to describe different aspects of the human experience. The word 'magic' can refer to either the theatrical illusion of magic or supernatural magic. The often paraphrased definition of a theatrical magician by the nineteenth-century French conjuring legend Jean Eugène Robert-Houdin illustrates this duplicity: "A magician is an actor playing the role of a magician". This quote has been cited by numerous magicians to remind themselves that showmanship is tantamount in a good magic act. However, if it wasn't for the double meaning of the word 'magic', this sentence would be a tautology: a statement that explains nothing. It would be like saying that a scientist is an actor playing a scientist. The magician seems to be both a pretender and a real magician, both the deceiving conjurer and

the powerful wizard. A more precise version of Robert-Houdin's definition can be found in an 1877 translation of the phrase by English magician Professor Hoffman: "A conjurer is not a juggler; he is an actor playing the part of a magician". Before the eighteenth century, before science became the dominant source of knowledge in Western culture, the word 'magic' was reserved for the 'dark arts' or witchcraft. The terms 'juggling' or 'legerdemain' were used to describe the performing of innocent conjuring tricks by entertainers pretending to be magicians. As the belief in the metaphysical foundations of magic began to wane, so did the distinction between supernatural and theatrical magic, until eventually the words 'juggling' and 'legerdemain' faded from the English language, with respect to references to magic. The more specific terms, such as 'conjuring', 'legerdemain' and 'sleight-of-hand' are still used in theatrical magic circles, but rarely used in common language. The distinction between the entertainer and the true magician has, however, been maintained in other European languages. For example, the Dutch word 'goochelaar', which has the same origin as the word juggler, is used specifically for a person pretending to be a magician to entertain people. The English language is unfortunately burdened with using the same term for wholly different concepts.

The contemporary uses of the word 'magic'—referring to either theatrical conjuring or supernatural magic—are quite distinct from each other, and the proponents of each type of magic form their own subcultures. Theatrical conjurers tend to meet in magic clubs and share their secrets through conventions, books and more recently through video and on-demand Internet videos. The believers in supernatural magic also enjoy meeting regularly to share information. Modern day witches organise themselves in covens and their community has spawned a cottage industry of instant spells,

instruction books and courses on how to control your life through these forces. Although both subcultures are based on the idea of magic, they are quite distinct from each other. One major difference is that conjurers tend to be sceptical of supernatural explanations. Research conducted by Peter Nardi, emeritus professor of sociology and regular author on conjuring-related matters (not to be confused with a magician of the same name) showed that magic performers are more sceptical about the existence of magical phenomena than the general public, and by extension even more sceptical than those who follow New Age beliefs.

If a conjurer is an actor playing the part of a magician, then what is it that magicians claim to actually do? Attempts to define magic in strict terms have not been very successful, and there exists a myriad of theories explaining what magic is. According to the anthropological view a belief in magic is the belief that supernatural forces can be invoked by a qualified person (such as a shaman or magician) through the power of spoken words or the appropriate actions, usually performed as part of a ritual. Magic in this sense contrasts with scientific theories. Science is deeply rooted in the philosophy of cause and effect and focuses on material causes that eventuate without interference of the scientist. Science is an impersonal and passive philosophy, while magic is based on active human interaction with metaphysical powers. It is in this aspect that magic and science seem diametrically opposed.

An alternative view was proposed by English science-fiction writer Arthur C. Clarke, who considers magic and science as parts along the same continuum of human experience. He expressed this succinctly in his *Third Law of Prediction*, which states that “Any sufficiently advanced technology is indistinguishable from magic”. In Clarke’s interpretation, the demarcation between magic and science

is not a fixed point; rather, it moves depending on the level of scientific knowledge of the person experiencing the magic. The Third Law carries in it a presumption that magic will be increasingly eclipsed by science as the level of knowledge about the universe increases. All magic is, in this sense, reduced to science that has not yet been made intelligible. For example, appliances that are commonplace in a contemporary house, such as a vacuum cleaner or microwave, would most certainly seem magical to a housewife of the nineteenth century. The Third Law portrays an optimistic view of science in the sense that it will progress towards a complete explanation of the world around us. However, Clarke is wrong to place magic and science along the same continuum. Magic is not in opposition with science or an extension of science, because they both seek answers to different questions. Supernatural magic is a belief system that aims to provide answers to questions related to the *meaning* of things, while science is a system of knowledge that seeks to *explain* things, their origins, functions and so on. Magic provides an answer to the question ‘why?’, while science provides explanations and answers to the question ‘how?’ Science and magic are, as such, not incompatible with each other but complementary aspects of the human experience.

The position one might take in the discourse of magic versus science does not actually matter. Magic, as a supernatural occurrence, might or might not exist factually, it most certainly exists in a cultural sense. For those with a belief in magic it is a vehicle to provide meaning to their lives. The key to understanding magic as a human phenomenon is neither to explain magic as an alternative to science nor to discount it as irrational nonsense, but to understand it as an integral phenomenon of human existence. By viewing magic as a normal part of human culture instead of a physical phenomenon

that needs to be explained, we can form a much richer understanding of social reality. Magic provides the hope that the unrelenting and unpredictable forces of the natural world can be overcome. In this sense magic shares a purpose with science and technology, in that their purpose is also to make the world more understandable and controllable.



Besides the duplicitous meaning of the word ‘magic’ as either a supernatural occurrence or a form of entertainment, the word is also used for something that causes *astonishment*, even when obviously caused by explainable physical processes. Magician Paul Harris sees astonishment as our natural state of mind; he associates it with a child’s mind-set in which there is little knowledge of the world and everything is magical. This mind-set is the reason that performing magic tricks for children below four years of age is difficult: they do not perceive the presented reality as special because, to them, the whole world is already magical.

The word ‘magic’ is often used in advertising to communicate that a product has properties beyond what can normally be expected. Numerous gadgets, such as self-inflating balloons, cloths with astonishing absorption rates and numerous others, are called ‘magic’ by marketers because they possess properties that appear miraculous. A search in the American trademark register reveals thousands of entries that use the word ‘magic’. For example, a company producing herbal nutritional supplements uses the name Jungle Magic™ to communicate the idea that their herbs have properties beyond the regular garden herbs, and a series of cooking appliances sell under the name of Cook Magic™. Using the word ‘magic’ in the branding of products and services taps directly into the human desire for a magical world where mundane activities can be undertaken almost

effortlessly. Just as primal cultures believe magic can help to ensure a bountiful hunt, modern day marketers use magic in their hunt for new consumers.

Another range of products in this category are ‘magic’ toys designed around natural processes that seem magical to the casual observer. For example, levitating rings that use magnetic repulsion to defy gravity, or a set of concave mirrors that creates the illusion of a coin that is so realistic people try to pick it up. English physics teacher David Featonby laments this use of the word ‘magic’ in these cases. He writes that it hides the fact that these so-called magical toys are based on known principles of physics: “Take the mystery out of physics, but leave the wonder”, is his advice. Featonby distinguishes between two types of magic: the first is sleight-of-hand and trickery, or conjuring; the second is hidden science, which relies on the audience having no full grasp of the science involved. Given that most people are not aware of the science behind the illusions—or do not experience similar effects in their daily lives—the toys are considered magical because they cause astonishment. For practising magicians, however, there is no difference between these two types of magic: both sleight-of-hand and hidden science are considered valid methods of creating the illusion of magic.

The final way the word ‘magic’ can be used is to describe the *quality of an experience*. Watching films or plays or walking in a forest can be ‘a magical experience’, meaning that these experiences have an ephemeral quality, a feeling that only poets can reconstruct in words. Magicians may try to invoke this feeling in their audience through their theatrical performance. For example, Australian magician Raymond Crowe creates a mesmerising display of shadows on a projection screen using nothing but his hands and a spotlight. Although no deception is used to hide the method by

which the shadows are created, the audience often describe seeing his performance as a “magical experience”. He also uses mime to enhance the magical illusions that he crafts on stage. Crowe masterfully manipulates a ball to create the illusion that it is floating while never really letting go of the ball with his hand. Through his performance, Crowe emphasises the narrative of a floating ball that tries to escape from him, not the impossibility of the method. Crowe, who calls himself an ‘unusualist’ instead of a magician, expressed the magical nature of his art in a lecture to a group of magicians in Las Vegas: “The older I get, the more I like magic that is not a trick”.



Magicians use the word magic in all four of the previously described interpretations: to describe their performance art as well as to indicate the supernatural world they are simulating. Magicians not only create the illusion of magic in the supernatural sense of the word but also create a sense of astonishment through their theatrical performance and provide audiences with experiences that have a magical quality. In this book the words ‘magic’ and ‘conjuring’ are used interchangeably in the context of theatrical magic, which is the craft of creating illusions. Theatrical magic is the performance art which blurs the boundaries between magic and science. Although spectators are most often placed in the frame of the scientist and ask themselves *how* the magic is performed, as a performance art magic has the ability to shift those questions to *why* it is possible that they have occurred.

The following chapters of this book cover the work done by the many scholars who have written about theatrical magic in an attempt to better understand magic as a performance art itself and how the performance of magic tricks helps us understand human behaviour. The essence of science is asking questions, and in this book some of

the answers to the questions that can be asked about theatrical magic are described. Is magic a performance art or simply a playful form of deception? What is it like to be a magician? What role did magicians play in society of the past? What is the practical purpose of magic and what can we learn from magic tricks? And, the question most often asked by scientists, how it is possible that we can be so easily deceived?

The answers to these questions not only provide a range of perspectives on magic, they also provide an insight into the diversity of the sciences. This books shows that there is no such thing as the science of magic. There is no single science of magic but rather various scientific perspectives on magic, and these perspectives leave many questions still left unanswered. The final question asked in this book is about the future of magic itself. Will magic slowly disappear as technology renders all miracles common, as predicted by Clarke's Third Law of Prediction, or will there always be a role for people who are able to entertain through artful deception?



About The Book

When people watch a magician create illusions, the question that is most pressing on their minds is: *how did he do it?*. This is not the only question that can be asked of a magic performance. A psychologist might ask why it is possible that the mind can be deceived, occupational therapists are interested in how performing magic tricks can help people with physical disabilities and sociologists research the subculture of magicians.

This book explores the questions that scholars from different fields of science have asked about the performances of magicians. For magicians this book provides new perspectives on their performance art. For people with a passive interest in magic, this book provides an insight into a quaint performance art that is normally surrounded in secrecy and clichés.

Peter Prevos is a social scientist and engineer who also dabbles in magic.

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