eISBN: 978-1-68108-263-9
ISBN: 978-1-68108-264-6

WHAT BELIEFS ARE MADE FROM

Jonathan Leicester

Bentham Books

What Beliefs Are Made From

Jonathan Leicester

Retired consultant neurologist, Neurology Department
The Royal Prince Alfred Hospital
Sydney
Australia

WHAT BELIEFS ARE MADE FROM

Author: Jonathan Leicester

ISBN (eBook):978-1-68108-263-9

ISBN (Print): 978-1-68108-264-6

First published in 2016.

Acknowledgements:

I am especially grateful to Pierre Beumont, late professor of psychiatry at the University of Sydney, for help and encouragement through the early stages of this project before his illness in 2003. I thank all the other people who have helped me with comments and suggestions on early drafts. The cover photograph of the battleground, First Bull Run, American Civil War, is by Robert Wines. Jon Gittoes made the drawing at the end of Chapter 13.

advertisements or ideas contained in the Work.

Limitation of Liability:

In no event will Bentham Science Publishers, its staff, editors and/or authors, be liable for any damages, including, without limitation, special, incidental and/or consequential damages and/or damages for lost data and/or profits arising out of (whether directly or indirectly) the use or inability to use the Work. The entire liability of Bentham Science Publishers shall be limited to the amount actually paid by you for the Work.

General:

1. Any dispute or claim arising out of or in connection with this License Agreement or the Work (including non-contractual disputes or claims) will be governed by and construed in accordance with the laws of the U.A.E. as applied in the Emirate of Dubai. Each party agrees that the courts of the Emirate of Dubai shall have exclusive jurisdiction to settle any dispute or claim arising out of or in connection with this License Agreement or the Work (including non-contractual disputes or claims).
2. Your rights under this License Agreement will automatically terminate without notice and without the need for a court order if at any point you breach any terms of this License Agreement. In no event will any delay or failure by Bentham Science Publishers in enforcing your compliance with this License Agreement constitute a waiver of any of its rights.
3. You acknowledge that you have read this License Agreement, and agree to be bound by its terms and conditions. To the extent that any other terms and conditions presented on any website of Bentham Science Publishers conflict with, or are inconsistent with, the terms and conditions set out in this License Agreement, you acknowledge that the terms and conditions set out in this License Agreement shall prevail.

Bentham Science Publishers Ltd.
Executive Suite Y - 2
PO Box 7917, Saif Zone
Sharjah, U.A.E.
Email: subscriptions@benthamscience.org

CONTENTS

FOREWORD

Most educated people have heard of Planck's Constant. Fewer have heard of Max Planck's other eponymous contribution to science, Planck's Principle, even though it is of arguably greater philosophical import. Planck's Principle aims to answer a question that has long vexed students of science – under what circumstances does a new theory replace an old one? Planck's answer; when all the adherents of the old theory are dead or retired.

There's a serious point here which philosophers too often ignore, but to which Jonathan Leicester is alert – as he puts it, the intellectualist theory of belief fails because it pays too much attention to the evidence for a proposition, and ignores many of the other factors that cause us to hold beliefs. Planck drew our attention to the obvious fact that scientists who have invested their career in a theory, who rely on it in their work and maybe derive great prestige from their association with it, will be very reluctant to give it up even when the evidence convinces others who have less at stake. We all know people who seem to believe things because of emotional attachments, ideology or financial gain, or just because of plain old wishful thinking. These processes cause beliefs but do not justify them, and we make allowances for them in our everyday dealing with other people, although perhaps we are not alert enough to them when they occur in our own thinking.

We also use "belief" to cover a wide variety of judgements – a snap judgement that the noise behind you means danger might be called a belief, and so might the considered conclusion you come up with after long hours in the library or the lab, weighing the evidence judiciously. Many philosophers and psychologists have contemplated the variety of causes and manifestations of belief and wondered if perhaps there is no such thing. This 'eliminativist' position does not necessarily imply that that humans never think about the world or respond to it or that we cannot have true and false representations, but it wonders whether there can ever be a unified theory of a phenomenon that seems so diverse as the myriad things we call belief.

Dr Leicester thinks there can be a unified theory, by arguing for the view that belief is a distinctive feeling. This allows him to account for the variety by saying that what beliefs have in common is the way they feel, rather than their functions or their causes. It has always been a minority view, because so many of us find it hard to identify the unique feeling that accompanies belief and belief only, but the arguments here are clear and concise and deserve everyone's attention, as does the great variety of phenomena covered in the book. What Beliefs are Made From is scholarly, fascinating and entertaining.

Dominic Murphy
History and Philosophy of Science
Faculty of Science, The University of Sydney
Australia

Belief is the central problem in the analysis of mind. … Beliefs give knowledge and error; they are the vehicles of truth and falsehood. Psychology, theory of knowledge and metaphysics revolve about belief, and on the view we take of belief our philosophical outlook largely depends.

Bertrand Russell, 1921.

On any longer view, man is only fitfully committed to the rational – to thinking, seeing, learning, knowing. Believing is what he is really proud of.

Martin Amis, 2008.

I know we're going to lose in Turin today, and I believe we're going to win.

Tim Parks, 2002.

You never believed in the meaning of this world and you therefore deduced the idea that everything was equivalent and that good and evil could be defined according to one's wishes.

Albert Camus, 1943.

PREFACE

Have you noticed that sensible people sometimes hold a belief that is contrary to evidence you would expect them to know and accept? Sometimes it is about something important. Beliefs are made from many things, a fact that has intrigued me for years and has led me to this exploration of the nature of belief. It is offered for anyone who is interested in belief, hoping they will find it helpful, as I have. It is about how people do believe, not about how they ought to believe. For readers new to the brain sciences there is a short appendix on the brain's anatomy and physiology, and for those more deeply involved in the topic there is a section of brief notes, often indicating a point of contention, or a guide to references. The book is intended to be serious but accessible.

Jon Leicester
Neurology Department
The Royal Prince Alfred Hospital
Sydney
Australia

CONFLICT OF INTEREST

The author confirms that he has no conflict of interest to declare for this publication.

ACKNOWLEDGEMENTS

I am especially grateful to Pierre Beumont, late professor of psychiatry at the University of Sydney, for help and encouragement through the early stages of this project before his illness in 2003. I thank all the other people who have helped me with comments and suggestions on early drafts. The cover photograph of the battleground, First Bull Run, American Civil War, is by Robert Wines. Jon Gittoes made the drawing at the end of Chapter 13.

CHAPTER 1

The Problem with Belief

Abstract: This brief introductory chapter outlines the reasons for and aims of this inquiry into the nature and purpose of belief. The main problem is that belief is such a poor guide to truth, which raised the question of whether this is its function, as it is commonly supposed to be. The inquiry will lead to the conclusion that the purpose of belief is to be a guide to practical action.

Keywords: Belief, Purpose of belief.

The great English philosopher John Locke gave this definition of belief: 'belief is the admitting or receiving any proposition as true, upon arguments or proofs that are found to persuade us to receive it as true.' The problem with belief is that people are not as rational as they might be. In the next chapter we meet strange beliefs that have been shared by whole groups of people, and in later chapters we will meet individuals who have believed that all the planets are inhabited and the outermost planets have the best inhabitants, that people are coming into a locked bedroom at night by passing through the floor, that all healthy infants start life with equal intelligence, and that the man who purports to be your father-in-law is really his exact duplicate robot driven by clockwork in his head. Why is it that while most of us don't believe in astrology some of us do? To my mind the evidence for evolution is overwhelming, yet many people are Creationists. It has been known for decades that human activities are causing the climate to change, yet there are still many skeptics and some outright deniers. All these beliefs need to be accounted for. There is no doubt that people base some of their beliefs on the teaching of parents and authorities without asking for evidence. If Locke's definition were relaxed to allow for this then some odd beliefs would be accounted for, but many others would not.

Jonathan Leicester

I find that I doubt that the universe and time began with a big bang when a tiny lump of amazing density exploded. Instead, I believe in infinity and eternity, I always have, and I can't imagine nothing, nowhere, or no-time. I know it would be sensible to believe the experts, yet somehow I doubt them. I have other beliefs that I cannot justify with evidence. One of these is that computers will never be conscious. Why do I believe that? I know it would be sensible to withhold judgement. There is something involuntary about belief. Why do people often form beliefs very quickly without persuasion from arguments or proofs? Why do optimists and pessimists so often form opposite beliefs from the same evidence?

What is belief? What happens in my mind as I believe that the Amazon River is in South America, or that five plus three is eight? What happens differently as I disbelieve that Mt Everest is in the Rockies, or that four plus two is ten? Or does nothing different happen? What is the purpose of belief? Locke's definition implies that belief is a guide to truth, but it seems a poor guide to truth. Perhaps it has another purpose.

I believe there are answers to these problems and questions, and my purpose is to present them. Perhaps the most fundamental answer, suggested by many observations, is that the purpose of belief is to guide practical action, not to indicate truth. Many of us half-know this implicitly, so we are usually not very surprised to find someone holds a mistaken belief, but we are surprised if we occasionally find a man acting contrary to a belief we know he has held. Once it is accepted that this is its purpose many of the problems with belief fall into place.

My interest in belief was stimulated by noticing the fallibility of ordinary beliefs about secular matters and it is from these beliefs that I will draw evidence and reach conclusions. I have not been especially interested in the matter of religious faith, though many people find this the most intriguing of all our beliefs. For this reason I will examine two issues that have some bearing on religious faith in the final two chapters.

CHAPTER 2

Some Strange Shared Beliefs

Abstract: This chapter describes and comments on mistaken beliefs that are or have been orthodox or at least common in whole communities. So-called culture-bound psychoses are illustrated by shen-k'uei in Taiwanese culture and malgri among natives of Mornington Island. So-called epidemic hysteria is illustrated by an outbreak of witchcraft in Christian Europe, the epidemic of shell shock among allied soldiers in the First World War, and the epidemic of RSI in Australia from 1980 to 1986. Brief notes on myths, legends, rumours, and conspiracy theories complete the chapter.

Keywords: Belief, Conspiracy theories, Culture-bound psychoses, Epidemic hysteria.

CULTURE-BOUND PSYCHOSES

These illnesses are not psychoses, and the beliefs they depend on are not psychotic. The term, though widely used, is a misnomer. There are many of these illnesses around the world, each stereotyped and peculiar to a particular culture. I have chosen two lesser-known examples for illustration, shen-k'uei and malgri.

Shen-k'uei is a syndrome of Taiwanese culture. It usually affects young men, who present acutely miserable and complaining of dizziness, backache, fatigue, insomnia, thinness and fear for their health and fertility. The patient is anxious about masturbation or wet dreams. The underlying beliefs are that the ejaculations have induced kidney deficiency. The kidneys are believed to be the source and store of vital essence, semen, which they distribute around the body as needed to sustain the vigour of the various organs. If too much is lost in ejaculations then ill health follows. These beliefs were widely held, and were promulgated by traditional doctors and faith healers.

Jonathan Leicester

Malgri occurred in Australian Aborigines living on Mornington Island. It was described by the medical anthropologist and psychiatrist John Cawte, who thought that personality factors contributed to vulnerability, though most of the islanders had at least some anxiety about contracting the condition. It was an abrupt illness. Victims complained of abdominal pain, headache, and distended abdomen. They sometimes vomited and might writhe and roll on the ground, clutching their bellies and crying out. On examining patients, mission nurses found no abnormality apart from abdominal distention from swallowed air. The underlying beliefs were that the coastline was divided into regions, and each region belonged to a subgroup of the tribe and had its own totem. Malgri could be caught either by going into the sea after eating land food without washing the hands in fresh water, or by going onto the land after eating seafood without washing in salt water. The sickness was caught by the totem of that region entering the body of the transgressor. Malgri would not be caught in a person's own totem zone, as that totem knew that person. When malgri occurred the people gathered and made a fire near the prostrate sufferer. A tribal doctor massaged his sweat over the victim's body. A grass or hair belt was unwound to make a long cord from the victim's foot to the water, for the intruding spirit to leave by. The throng then chanted the malgri song, exhorting the spirit to depart; while they watched for a shooting star, believed to be Malgri's eye, diving from the sky to indicate the spirit's departure. The cord was then cut, the sufferer having recovered.

EPIDEMIC HYSTERIA

Epidemic hysteria is a poor but established name for this condition, which is rather like culture-bound psychosis in our culture. The fertile ground for an epidemic is that a considerable section of the community has a shared belief in the condition, including at least some of the people who have authority, and that some people are getting benefit from it. The whole community does not have to believe: there usually are skeptics who often disbelieve the genuineness both of the entity and of the individual sufferers, but who are overruled by the weight of belief against them. There is often evidence, either then or later, that some of the apparent believers were malingering or manipulating, but some real believing is a *sine qua non*, without it the epidemic will not occur. Once established, an epidemic usually expands and intensifies. As this happens its consequences

become more serious, until pragmatic considerations necessitate that it stop. Whatever its truth or falsity, the skeptics then get the upper hand, the benefits are terminated, and the epidemic subsides. I have chosen three examples for illustration, an outbreak of witchcraft in seventeenth century France, the epidemic of shell shock among soldiers in the First World War, and the epidemic of RSI in Australia from 1980 to 1986.

Fig. (2.1). The burning of Grandier (From engraving by Gabriel Leguè, 1880).

The social factors that fostered outbreaks of witchcraft in Christian Europe were belief in supernatural causes and preoccupation with a Christianity that in some respects had left the gospels and lost its way. Witchcraft could be used as a weapon against enemies. Accusations of witchcraft often broke out when animosity between villagers was running high. They were especially likely if local leaders encouraged the accusations. Supernatural causes were sometimes invoked for the most natural of events. For example, a rider thrown from his horse had

CHAPTER 3

Four Theories of Belief

Abstract: This chapter analyses the four main theories of belief in some detail. These are the intellectualistic theory that belief is a cognitive act related to evidence that the thing believed is probably true, the dispositional theory that we recognize our own beliefs by observing how we react to things, the feeling theory that belief is a particular feeling that comes to us and is a signal to us that we believe or think to be true the thing under consideration, and eliminativist theories that belief does not exist, but is an illusion of our language and culture. The strengths and weaknesses of each theory are examined. The main weaknesses of the intellectualistic theory are the high frequency of irrational beliefs and beliefs the believer cannot justify with evidence, the speed and ease of belief, the inability to withhold judgement, and the largely involuntary nature of belief. The attempts that have been made to overcome these difficulties are considered. The main weaknesses of the feeling theory are that some people report that they are not aware of feelings of belief, that the theory makes use of subjective experience and introspection, that beliefs have duration and can continue beyond the brief time they are felt in consciousness, and the existence of what are called tacit or unconscious beliefs. The attempts that have been made to overcome these difficulties, including my own contribution, are considered. The balance of evidence seems to favour the feeling theory, and this theory is adopted.

Keywords: Belief, Dispositional theory, Eliminativist theory, Feeling theory, Intellectualistic theory.

There are four main theories about the nature of belief. They are the intellectualistic theory, the dispositional theory, the feeling or occurrent theory, and eliminativist theories. The intellectualistic theory proposes that belief is a cognitive act related to evidence that the thing believed is probably true, and implies that the purpose of belief is to indicate truth. The dispositional theory holds that we recognize our own beliefs by observing how we react to things

(much as we infer the beliefs of other people), and implies that the purpose of belief is to guide action. The feeling theory claims that belief is a particular feeling that comes to us and is a signal to us that we believe the thing under consideration, and eliminativist theories claim that belief does not exist, but is an illusion of our language and culture. There are difficulties with each of these theories. I will now examine them carefully, seeking to find which one fits the evidence best.

THE INTELLECTUALISTIC THEORY OF BELIEF

This is perhaps the first theory of belief that comes to mind. Over the years I have asked many people how they define belief. Most have answered to the effect that belief is based on evidence and is the state of knowing or thinking that something is true or probably true. Some have added the rider that there is also religious faith, which, being belief or trust in something that cannot be proved by evidence, is perhaps special and different from other belief. Others have added a rider to claim that there is a distinction between opinion and knowledge, and a fundamental difference between believing opinion and knowing knowledge, an issue that I will consider in Chapter 18. These people described the intellectualistic theory of belief. The theory has strong intuitive appeal, for it is natural for people to be confident that their beliefs are true, what we believe feels true. The theory is supported by some experts. Locke put it well when he wrote 'Belief is the admitting or receiving any proposition for true, upon arguments or proofs that are found to persuade us to receive it as true, without certain knowledge that it is so.' Modern authors who accept the theory include the neuroscientist Joseph Le Doux – 'Believing, like all good higher cognitive functions, goes on up in the neocortical penthouse,' and the philosophers Güven Güzeldere – 'Beliefs are paradigmatic of cognitive states,' and John Searle – 'Indeed the proposition, construed as believed, just is identical with my belief. It is not the object of the belief.'

The intellectualistic theory defines belief in terms of its cause, or what it supposes its cause to be. It holds that belief is caused by cognitive appraisal, and says that belief is the state or attitude that results when appraisal concludes that a proposition is probably true. It does not specify what this state or attitude is except

in the vaguest terms. It is this gap that Searle is pasting over in his statement quoted above. The theory implies that the purpose of belief is to indicate truth.

The most obvious difficulty with the intellectualistic theory is how to account for the high prevalence of irrational beliefs and beliefs that the believer cannot verify with evidence. These beliefs are often taken to include religious faith, myths, other unfounded shared beliefs, and the delusions of people with severe mental illness. A common response to this difficulty is to exclude these beliefs as special cases. Shared beliefs are excluded by the claim that they can be believed on authority without the need for evidence. Delusions are excluded because they are patently false, often bizarre, and unaffected by contrary evidence, and by the presumption that schizophrenia and severe depression are physical diseases and the delusions they cause are pathological products of a diseased brain.

Many irrational and unverified beliefs are not covered by these exclusions. In 1991 a respected poll of adult Americans found that one person in four reported some belief in ghosts, one in four believed in telepathy, one in six believed they have communicated with a dead person, one in ten believed they have seen or been in the presence of a ghost, one in ten believed they have talked to the devil, one in seven believed they have seen a UFO, and one in four say they have some belief in astrology. Some readers may be surprised by these findings or even skeptical about them, but other surveys have found much the same thing. There is a well-known bias to believe that one's own beliefs are more widely held than they really are.

Even very intelligent people sometimes hold odd beliefs. Throughout his life Tolstoy believed Shakespeare's plays were 'insignificant' and 'empty.' Freud, despite the dissuasion of his friends, believed the Earl of Oxford wrote Shakespeare's plays. Kant never retracted his belief that all the planets are inhabited and the farthest planets have the best inhabitants. Sir Fred Hoyle, the eminent astronomer, believed that new species develop because life forms that fall to Earth from space cause mutations. The French philosopher Helvétius believed that all healthy infants were born with equal potential intelligence. The Nobel Prize winning physicist Lenard believed the theory of relativity was 'mathematically botched-up' and 'now gradually falls to pieces.' These beliefs

CHAPTER 4

The Evolution of Mind

Abstract: The evolution of the nervous system is described, with speculation on when consciousness first appears and when belief first appears. The developments of nonverbal communication and flexibility of response are traced. With humans the ability for mental simulation and inquiry by thought experiments appears, greatly extending the old method of trial by error. Humans still do most of the old things in the old ways, nonverbal communication, emotional feeling and expression, trial and error, family and kinship, in-group behaviour, aggression, conditioned behaviour, and instinct. System 2 reasoning has evolved, while old system 1 reasoning, of which belief is a part, retains its importance. The unique ability to adapt the environment to suit human needs has evolved.

Keywords: Belief, Evolution, Mental simulation, Nonverbal communication, Reasoning.

An introductory word about evolution. Every species increases its population when the circumstances of the prevailing environment favours it. Eventually, inevitably, this expansion reverses as circumstances become less suitable. The species may deplete the resources it depends on, be devastated by a disease of overcrowding, or suffer from some external change such as a harsh drought, an Ice Age, or the arrival of a strong competitor or a new predator. In unusually good times the population of a rapidly reproducing species sometimes explodes in a plague. Australia has occasional plagues of mice, their population expanding hugely in the autumn of a good season and collapsing when winter comes. The tendency of all species to increase produces competition between individuals and between species, leading to the culling of those individuals and those species less able to survive and reproduce. Darwin called this natural selection. It involves differences in the capability for surviving, and differences in reproductive success,

Jonathan Leicester

including success in competition for mates (sexual selection). Among species with parenting and family units there is fitness from supporting the family (kin selection), and in species living in larger societies there is fitness from supporting the society (group selection). Evolution has two facets. One is the adaptive modification of existing species, which can be relatively rapid, as the selective breeding of domestic animals shows. The other is the appearance of new species, by a slow process of greater change.

The jellyfish is the simplest animal that has a nervous system. It has a nerve net of neurons or nerve cells, that are much like the neurons of higher animals. The nerve net regulates the jellyfish's swimming action and holds it upright in the water. The jellyfish detects the upright position using tiny calcified plumb bobs that hang in little sacks of fluid within its body. When the animal is tilted the bobs touch the sides of the sacks and stimulate sensory cells that trigger its righting reflex. The nerve net is nothing like a brain. The jellyfish is a reflex automaton, a living robot. It has a disposition to be upright. Does it believe it should be upright? It would be like saying that sunflowers, which have no neurons, believe they should point to the sun, and that thermostats believe they should regulate temperature. Almost everyone would say that this is not what they understand by belief, though it is a behavioural disposition. If the feeling theory of belief is correct, then belief requires at least a primitive consciousness.

The earthworm has a nervous system with a cord of nerve fibres or axons that runs the length of the worm. At each of the worm's segments or rings the nerve cord has a slight swelling, called a segmental ganglion, composed of nerve cell bodies. Each segment has nerves that transmit to that segment's muscles and receive from its sensory organs. The sensory organs can detect bright light, touch, and noxious stimuli. At the worm's head there is a larger ganglion called the cerebral ganglion that drives its segments. The cerebral ganglion is not a brain. Worms do not learn or remember to any extent. Despite the relative simplicity of its nervous system the worm has a repertoire of complex behaviour that is 'wired in' to its nervous system, reflex, inflexible, and predictable. It is nocturnal. It lives underground and avoids daylight. It burrows and feeds. It wriggles vigorously when in the open or when subjected to noxious stimuli. It pairs on the soil surface at night to copulate. Worms are probably unconscious, reflex automatons without

beliefs, though there is no known way to be certain of this.

The honeybee is an advanced insect. Its nervous system has a paired nerve cord with segmental ganglia and nerves, and a cerebral ganglion. The cerebral ganglion is comprised by the optic lobes, the antennal or olfactory lobes, and the protocerebrum. The optic lobes contain neurons of the visual system from the insect's compound eyes. They have neurons that respond to yellow, blue, or ultraviolet light. The bee's antennae have receptors for olfaction. The antennal lobes contain neurons related to olfaction. These neurons are facilitated by repeated exposure to particular odours and this plasticity explains the bee's ability to learn and remember the smells of flowers, other bees, and its own hive. Olfaction is processed further in some of the nuclei of the protocerebrum. The protocerebrum integrates sensory information and memory, and adapts the bee's complex repertoire of instinctive behaviour to the requirements of the situation. It has brain-like functions, though its structure is quite unlike the brains of vertebrates.

The worker bee can navigate between the hive and the richest flowers. This is done by several means, including the famous waggle dance, a prosemantic communication[2] that gives other workers the direction and distance to the best pollen and nectar. Bees also navigate using the position of the sun, the pattern of partially polarized light across the sky, the positions of prominent landmarks, and probably by magnetic field. Bees learn and remember. With experience workers get better at foraging, navigating, and extracting nectar from flowers. Bees respond to conditioning. For example, they can be trained in the behaviour laboratory, by using electric shocks, to land only on the safe 'petal' of artificial flowers.

Bees' navigation is more complex than the jellyfish's righting reflex. It involves some learning. The worker has a disposition to keep returning to the best flowers. Does she believe the flowers are there? It is a harder question than it was for the jellyfish. I believe we can't give a definite answer. Learned and conditioned behaviour does not prove consciousness – it is sometimes unconscious in humans, and is part of the artificial intelligence of some computer programs. The unsolvable puzzle about which animals are conscious and which animals merely

CHAPTER 5

Causes of Belief

Abstract: The things that lead people to form beliefs are described. Among the factors discussed are the difficulties in using evidence well, the failure to withhold judgement, vacillating belief, the unconscious biases in reasoning, the tendency to wishful believing, the reluctance to change prior beliefs, the influence of shared beliefs of a community or group, the contrast between direct experience and testimony, how language is used, the effects of repetition and propaganda, personality, ego defence mechanisms, mood and emotion, mystical thinking, revelation, and natural credulity. A section on intelligence explains how high intelligence gives poor protection from holding foolish beliefs, with examples of mistaken beliefs of gifted people.

Keywords: Belief, Evidence, Intelligence, Propaganda, Reasoning biases.

USING EVIDENCE

Evidence is the most important of the causes of belief and needs little comment. There is a natural and pervasive tendency to be satisfied with the evidence we know, to be insensitive to its adequacy and quality, to assume that, in Daniel Kahneman's phrase, 'What you see is all there is.'

FAILURE TO USE EVIDENCE

It would be slow and tedious to weigh up the evidence about everything we encounter. Instead, assent is often granted at once, without appraisal, and, once it is felt, assent usually prevents inquiry (Chapter 15). A common instance of belief being too fast for cognition is the shopping item priced at $9.99. We know intellectually that, for all practical purposes, it costs ten dollars, but belief, the feeling answer, gets in first, as shopkeepers know.

A simple cause of wrong beliefs is lack of knowledge. This is especially potent

Jonathan Leicester

when the believer is unaware of his ignorance. Transparent examples of this trap are common in children. My young grandson did not believe that a photo of a small boy was of his father, or that a room with no bed could once have been his father's bedroom.

There are many reasons why people fail to use evidence. People often assume wrongly that evidence does not exist, or that there is no more evidence than that which they already know. They don't ask themselves what they would need to know to have a good opinion, but give a quick answer based on what they do know. Most people, whether they believe or disbelieve in astrology, do not know the evidence that exists concerning its validity: other things determine their opinions about it. Evidence may be available, but people may not know how to find it, or it may be unobtainable for them – as with the truth of rumours about espionage. This can be subtle, as when we express strong beliefs about the release of a prisoner on parole formed from a brief news report. Even if we did have all the facts, we do not have the legal or social expertise to do the parole board's job. Much unreflective pub talk falls into these types of traps. Often we do not care enough about a complex issue to bother mastering the evidence about it, which is perfectly reasonable, yet we often have an opinion about it. As shown in Chapter 3, everyone holds many personally unverified beliefs that may be true but for which they cannot provide any proper evidence.

There are less honest reasons for neglecting evidence. When evidence is strong it should control belief, but it does not always do so. When some of the other factors involved in forming beliefs are operating too strongly in an opposite direction a contrary belief will form. The irrational believer may avoid, discount, rationalize, suppress, or deny the evidence against his belief.

FAULTY USE OF EVIDENCE

Even when people do their best to form correct beliefs potent unconscious biases are usually at work. One bias as we consider some issue is that the first consideration that comes to mind, which is called the most salient or available factor, exerts an unduly strong influence. The problem is that we form a belief about the first factor while we consider it. This belief may stop the assessment or

it may act as a prior belief that distorts and diminishes the later assessment of less salient factors. We have no control over salience, the order in which things come to mind. The most salient factor is often something already well known, or topical, or emotionally charged. Another bias makes many people feel that outcomes that are very probable are less likely than they really are and that outcomes that are unlikely have more chance of occurring than they really do. Untrained humans are poor at statistics. It is one reason why lotteries are popular, and why some people are nervous on plane flights. Salience is a factor in this bias, because unusual outcomes are dramatic, memorable, and newsworthy. There is a bias to be too ready to predict a rare outcome because it has happened before in similar circumstances – we take too much account of the similar circumstances and not enough of the rarity of the event. This bias underlies some phobias – having been stuck in a lift once, an anxious person becomes afraid of elevators. When attempting to explain or predict other people's behaviour there is a bias to give too much weight to their personality and their usual behaviour and too little weight to the situation and its constraints on them. There is a hindsight bias; once an event has happened people tend to believe that they could have predicted it, or even that they did predict it. Racehorse punters are forever doing this. It is easy to be wise after the event, and too easy to blame persons or organizations unfairly whenever there has been a bad outcome. In our beliefs about events that we have a part in there is a bias to believe our role was larger and more praiseworthy than it was. Politicians who take credit and shed blame may do so deliberately, but it is a natural unconscious bias that we are all subject to. It has been shown in the beliefs of teachers about the reasons for their students' results. Overconfidence of correctness is very common. We believe our beliefs and are certain of our certainties. In a general knowledge test one quarter of the answers that college students felt quite certain were correct were wrong. The students were uncritical of their answers, as one might expect, since certainty stops inquiry. We have a bias to believe our own opinions are more widely shared than they are, and other opinions less widely held than they are. Thus we are surprised by the popularity of some television shows. This bias is perhaps partly because, by circumstance and by choice, we mix with people who are like us and we choose news and entertainment that we prefer. We are poor at receiving flattery and criticism. We tend to believe flattery even when we should realize it is unwarranted, and to

CHAPTER 6

Belief, Consciousness, Attention

Abstract: A brief section on consciousness describes the different definitions the term has had, discusses the vexed issues of qualia, subjective experience, or mental events, and the explanatory gap, and announces the intention to take consciousness for granted and get on with the inquiry into the nature of belief. Attention is considered more fully, because it determines what we notice, which affects what we believe. There is deliberate attention and automatic attention, and a centre and periphery of attention. The factors that attract and terminate attention are discussed and illustrated

Keywords: Attention, Belief.

CONSCIOUSNESS

Consciousness means different things to different people. For neurologists and anaesthetists it means being awake. For them, all mammals, birds, and reptiles are conscious: they all have a cycle of wake and sleep, and are affected similarly by anaesthetic drugs and by concussion. This is relatively simple, and its physiology is understood – there is a switch in the brainstem that turns the higher brain on and off. For scientists and philosophers consciousness means being aware while awake. For them, an awake animal with a blank 'mind' would be a reflex automaton, switched on but not conscious. Awareness requires having at least some conscious mental events. Mental events, known technically as subjective experience or qualia, are not understood.[4] They are unique, there is nothing else like them. It is a mystery how the brain, which seems to be an electric circuit, produces mental events. The philosopher Joseph Levine called this the explanatory gap. Some experts believe that there is something unique about consciousness that we will never understand. At present it cannot be proved that other people experience mental events, let alone that animals do. This allows

Jonathan Leicester

widely disparate speculations about which animals are conscious with awareness. Reflex behaviour can be elaborate, as the bird's nests of Chapter 4 demonstrate. Some philosophers have an even more demanding definition of consciousness. For them consciousness means self-awareness, which means that the animal knows that the mental events it has are had by its self. It is likely that only a few of the highest mammals, and possibly a few birds, satisfy this criterion. A few maverick philosophers, called eliminativists, have even argued that consciousness does not exist.

Contrary to what I have just written, some experts of high standing claim that we already understand consciousness. They offer unproven *post hoc* theories that assume neurons are never more than components in electric circuits and conclude that electric circuits like the brain's simply produce consciousness. They say there is nothing more to explain. For them the explanatory gap is a furphy. Confronted by the inexplicable, they say there is nothing to explain. Bram Stoker noticed this trait among scientists years ago. His fictional hero, in broken English, says "Ah, it is a fault of our science that it wants to explain all; and if it explain not, then it says there is nothing to explain."

A person's beliefs about consciousness can affect his or her beliefs about the plausibility of the soul and we will have to return to the subject when we discuss that question in Chapter 20. Until then I will take consciousness for granted and get on with our inquiry into the nature of belief.

ATTENTION

What do we notice, and why do we notice it? We can only form beliefs about things we have noticed, other things pass us by. We notice and are aware of only a small part of all the things that go on around us and within us, as deliberately attending to the touches of one's clothing shows. Attention is the mechanism that selects the things to be noticed. It is a limited mechanism, we can only attend to a few things at the same time, and can hold no more than about six items in awareness at once. How attention works is important to the student of belief. We begin by noting that attention has a centre and a periphery, and can be automatic or deliberate.

Centre and Periphery of Attention

There is a focus of concentration and other things that are happening that one is barely aware of. Some but not all the items at the centre of attention become expressed as thoughts by inner speech. Items at the periphery of attention are not announced in this way. Peripheral items include the background of vision, a vague awareness of self, and slight emotional feelings, often gentle contentment. A bird has chirped outside the window and the kettle is still where we expect it to be as we prepare to make tea. There are borderline instances where it is difficult to know whether an item is part of consciousness or not.

Automatic Attention

The simplest instance of attention at work is the automatic switching of attention to a stimulus in the environment. Certain sights, sounds, pungent smells, and sharp pains catch attention. In vision we say the item 'pops out'. The army teaches that things are seen because of their size, shape, spacing, silhouette, surface, shine, and movement. This automatic attention occurs very quickly, even before perception is completed. Yet even this is subject to influences from higher levels of the brain. Mild pop-out stimuli will not be noticed during deliberate attention on another matter. With repeated exposure objects often cease to pop out. On first seeing a uniformly wooded hillside broken by one house you notice the house, but after passing by daily for a month you no longer notice it, you have become habituated to it. This is not passive, the brain changes as we learn that the stimulus is not important. The birds learn that the scarecrow is harmless. A relevant stimulus often has the opposite effect, it sensitizes involuntary attention. For example, when a pathologist looks down a microscope his attention often leaps to a particular diagnostic feature that a novice would not notice. He has learnt its importance and it pops out for him.

Attention to emotion can show habituation, or it can show sensitization. After being exposed to too much direness Macbeth almost forgot the taste of fears, whereas Lady Macbeth became increasingly fearful. Sensitization to emotion is bad for people. Sometimes with mental illness attention to depression or to anxiety and fear becomes so complete and constant that the emotion fills and

CHAPTER 7

Memory and Belief

Abstract: Many beliefs depend on memories, and memories can be unreliable. This chapter deals briefly with the anatomy and physiology of memory, and defines the different kinds of memory – long-term or declarative memory, which includes episodic or autobiographical memory, and semantic memory or memory of learned knowledge, source memory, procedural memory, working memory, and implicit, tacit or non-declarative memory. Special attention is given to working memory and tacit memory, because they are important, and will be unfamiliar to some readers.

Keywords: Belief, Implicit memory, Memory, Neural plasticity, Working memory.

What we remember, what we misremember, and what we forget affect what we believe. The neural circuits involved in memory are different for different animals and for different types of memory. The bee's brain has none of our memory circuits, yet bees remember. What is common to all memory is dependence on neural plasticity. For every new memory there is a change in the nervous system.

In humans memories are held in the cortical areas of the functions they relate to. Thus memories of names are held in the language areas of the left temporal lobe and memories of spatial relations, such as the way from the kitchen to the bathroom, are held in the right parietal lobe. The hippocampus is needed to add new memories and to retrieve into consciousness most old memories. Bilateral destruction of the hippocampus or its main connections causes loss of memory that is severe and permanent. The patient retains only some very old and much-used memories. New information, though understood, is forgotten within a minute. The usual causes of this are one type of stroke, severe head injury, severe drug overdose, nonfatal cardiac arrest, and heavy alcoholism with binge drinking.

Jonathan Leicester

Less severe hippocampal amnesia is often the first sign of dementia.

New memories are retained by a process called embedding or consolidation. We only embed a small fraction of the perceptions and thoughts that cross our minds. We remember items that attract attention because they seem important or interesting, or because they have emotional impact, and we remember items that are repeated frequently or rehearsed often. Such items activate the neurons related to them enough to induce neural plasticity. The hippocampus has exceptional neural plasticity and once activated it remains facilitated for an hour or more. Somehow during that time an unconscious process of embedding the item goes on. Embedding uses long term neural plasticity, which involves the whole neuron and the activation of its genes for the synthesis of new proteins and new synapses. Embedding is interrupted by concussion, so concussed patients often do not remember events from the hour or so before the injury. In laboratory animals embedding fails to occur in experiments that block or poison long-term neural plasticity. Once a memory is embedded it may be retained for minutes, days, or years. The more strongly it is embedded the longer it will be retained, but most memories are eventually forgotten.

A memory will come to mind in response to cues by a process called recall. Recall can be automatic or it can be directed by deliberate effort, though even deliberate search gives no direct control over which particular memory rises to consciousness. Cues are things that have some relation to or association with the memory, presumably they activate some of its facilitated cortical neurons and their hippocampal booster, with the result that the memory is recalled and its embedding is refreshed. Neglected memories slowly weaken, come to need stronger cues for their recall, and are eventually lost. Some memories have been cued and recalled so frequently in the past that they are remembered even after severe hippocampal damage. The patients remember their name, much of their own language, how to count, and often a few events and items of knowledge from their past.

This type of memory is called *long-term memory* or *declarative memory* (because the person, given the right cue, can report the memory). It includes *episodic memory* (autobiographical memory) and *semantic memory* (memory of learned

knowledge). Episodic memory includes *source memory*, which is memory of when and where each episode or event of one's life occurred. Source memory is more difficult than simply recalling the episode, and uses the frontal lobes. There is a bias to judge that distant events happened more recently than they did, unless they have been anchored by learning their date. The associations between memories are themselves memories. This is called *associative memory*, and is much used in thinking.

There are other less familiar types and classes of memory. *Procedural memory* is memory for learned skilled actions, such as riding a bicycle, famously never forgotten. Procedural memories use motor regions of cerebral cortex and cerebellum. They are hard to describe, and do not use the hippocampus. Two other types of memory are especially important for this inquiry into belief, and need to be described in a little more detail. They are working memory and implicit memory.

WORKING MEMORY

Working memory is so named because it enables us to do things. For example, a cook remembers her purpose as she goes to the refrigerator for milk, then to a drawer for a knife, and so on. Most of these memories are transient and are soon replaced by others like them, but if they were to fail we would be unable to function. Some readers may feel that this is not real memory, but items are being retained, since neural transmission is over in a few milliseconds. Working memory is so automatic and effortless that it is unnoticed most of the time.

Working memory lasts for a minute or less. It deals with items that are in consciousness. It is fully loaded by about six items. New working memories obliterate older ones. Simple items are easier to keep in mind than complex ones, and meaningful and familiar items easier than senseless and unfamiliar ones. Thus a set of digits is easier to remember than a set of words, a sentence is easier than a set of words, and a set of foreign words is much harder.

Working memory of an item involves the region of cortex that serves other aspects of that item – visual areas are used for a visual item, language areas for a verbal item, and so on. Deliberate working memory also uses parts of the frontal

CHAPTER 8

Introspection and Belief

Abstract: Introspection is necessary for knowing what conscious mental events a person has in his or her mind. This is all the feeling theory of belief asks it to do. Denying or neglecting this is one source of eliminativism. The explanations we offer for our own thoughts, emotions, preferences, choices, beliefs, desires, motives, statements, and actions, which seem to come from introspection, are unreliable. Introspection also gives us a set of potent intuitions, which include some of philosophy's most intransigent problems — that time flows, that mind and body are dual, that mental events are immaterial, and the intuition on which this book depends, the intuition that conscious mental events cause behaviour. The chapter ends with a comment on the uniqueness of mental events, and their difference from a computer output.

Keywords: Belief, Introspection, Intuition.

We are at a restaurant when my wife asks me why have I ordered chicken, saying that she had expected me to choose steak. I have replied that I felt like a change. I seem to have found this answer by inspecting my mind, from the internal evidence of introspection. The explanations we offer for our own thoughts, preferences, choices, beliefs, desires, motives, statements, and actions seem to come to us in this way, as I ask myself why do I enjoy hiking, or why am I fond of Margot.

Introspection has fallen into disrepute among many scientists and philosophers during the last hundred years. There are good reasons for this. There is increased appreciation of the importance of unconscious components in mental life. Early attempts to place introspection on a scientific footing foundered in disagreement. It was found to be more productive to treat the brain as a black box with inputs or stimuli and outputs or behaviour, an approach that led to the valuable discoveries

of behaviourism. Modern cognitive psychology has largely superseded behaviourism and does probe the inner workings of the brain, but the reliance on observable objective findings is still present. Perhaps this is inevitable, but the neglect of subjective mental events has had consequences, one of which is that the feeling theory of emotion, which was once orthodox, is now sometimes discounted and occasionally scorned (Chapter 9). Insistence on complete disregard of introspection has led to attempts to deny the existence of mental events and even of consciousness, theories that most of us find untenable. For example, the philosopher Georges Rey asks 'How are we to understand our insistence on the existence of consciousness given that we cannot find a place for it in any reasonable theory of the world?' He attributed this insistence to our naive faith in introspection, and concluded that consciousness, being not understood, does not exist.

We need to take a look at introspection, to sift out those aspects that it can and must be used for from those where it is unreliable or worse. Introspection is needed to tell us what the contents of our consciousness are – what thought, memory, or belief is in mind, what emotion, perception or imagining. Introspection is the only way of knowing this and everyone uses this knowledge, without it psychology and life would be impossible. Mental events are the one aspect of the brain about which neuroscience is silent.

The explanations we offer for our own thoughts, emotions, preferences, choices, beliefs, desires, motives, statements, and actions are unreliable. Freud and his school showed this abundantly, and it has since been proved by scientific psychology with mentally stable subjects. In a famous experiment shoppers were asked to choose a pair of stockings from a row of four identical pairs that they inspected from left to right. The last pair inspected was selected four times as often as the first. None of the shoppers who chose the right hand pair gave the correct explanation for their preference, even after they were asked whether it might have been because it was the last pair they examined. Introspection tells you what is in your mind but it cannot tell you how or why it got there. Anyway, it is an illusion that these beliefs come from introspection. They are generated in the same way as ordinary beliefs. When my wife asked me why I had ordered chicken I treated her question as I treat any question. I started inquiry, raising

possibilities until one, perhaps the first to come to mind, aroused belief. I then offered that possibility as my explanation. So it is with all such 'introspections.' The resultant beliefs may be correct, but they are often wrong. We simply do not know and are forced to infer and guess. Being about the self, these beliefs are especially liable to be distorted by emotion and the ego defence mechanisms.

Rightly or wrongly, introspection gives us a set of potent intuitions – the intuition that we perceive truly what really exists around us, the intuition of free will, the intuition that mental events cause behaviour, intuitions about the nature of space and time, and the intuition of dualism or the belief that mental life or mind is immaterial and different from the material body and brain. Some people feel the power of these intuitions even more strongly than others do. Introspection's intuitions include some of philosophy's oldest and most intransigent problems – that time flows, that mind and body are dual, that mental events are immaterial. The thesis of this book depends on the intuition that conscious mental events cause behaviour. The problem of whether the seemingly immaterial mind can cause behaviour will be returned to in Chapter 20, without reaching an indisputable answer.

The brain is often compared to a computer. Some people take the analogy very seriously, so much so that they predict that a computer which modelled the brain's circuits sufficiently closely would be aware and would experience mental events. It is worth examining what a mental event is, because I believe this throws doubt on their prediction. Mental events are decoded or transcoded products of neural activity. The landscape that your visual system has been processing in its electric or neural code reappears, so to speak, decoded. This is different from a computer printing out a picture it has 'seen' or a telephone emitting speech it has 'heard.' Their outputs are physical. They give out the same patterns of light waves or sound waves that they coded to begin with. The brain, or its eye and ear, also codes these waves, and we know how, but its decoder or transcoder somehow produces something new and different, mental events. This is unlike the output of any computer.

CHAPTER 9

Emotions and Feelings

Abstract: The first part of the chapter discusses the nature of emotion and the new and old definitions of emotion. The reasons for working with the old or feeling theory are that it is still the familiar theory, that it provides a unifying factor for all the otherwise very different emotions, and it allows the separation of emotion, which is considered to be a signal to the person having the emotion, from facial expression, body language, and nonverbal communication, which are considered to be signals to other people, evolved to elicit helpful responses. Emotions are found to share a number of properties with belief, this is considered to be support for the feeling theory of belief. There is comment on the ineffable nature of emotion.The second part of the chapter deals with the nature of particular emotions, and the effects they have on the beliefs of people who are under their influence

Keywords: Belief, Disgust, Pride, Remorse, Spirituality, Tenderness, Theories of emotion, Urge.

Students of belief have two reasons to be interested in emotions and feelings. We need to know the general properties of emotions and feelings to test the theory that belief is a feeling, and we need to know how each emotion affects the beliefs of a person who is under its influence.

PROPERTIES OF EMOTIONS AND FEELINGS

Some readers will be surprised to learn that there is controversy over the meaning of the word emotion. I was brought up to understand that an emotion is a subjective feeling or mental state, regardless of how it is caused and what effect it has. This is the feeling theory of emotion, which I will attempt to justify. It was once orthodox, and is still found in dictionaries. *Emotion* – A mental 'feeling' or 'affection', as distinguished from cognitive or volitional states of consciousness.

Jonathan Leicester

'Feeling' as distinguished from other classes of mental phenomena (Oxford English Dictionary, part of definition). This theory of emotion comes from folk psychology, and many people still think of emotion in this way. Folk psychology also assumes that emotions can cause behaviour – the man ran away from the bear because he was frightened. In everyday use the nouns 'emotion' and 'feeling' are often interchangeable near-synonyms, though there are some conventions in their use, such as calling anger an emotion and remorse a feeling.

Recently the feeling theory of emotion has been criticized and new views of emotion have gained dominance in psychology, philosophy, and neuroscience. In his book *What Emotions Really Are* the philosopher Paul Griffiths wrote of the 'evils of the feeling theory' in a sentence that presumed his readers understood and sympathized. Neuroscientists have noticed that emotional situations produce patterns of bodily changes that tend to happen together. As well as the subjective emotional feeling there are such things as increased alertness, capture of attention, altered facial expression and body language, changes in heart rate and blood pressure, pallor, flushing, sweating, change in muscle tone, and stereotyped voluntary or semi-voluntary behaviour. Some modern workers believe that these reactions are so regularly locked together in uniform patterns that they are units, and these units are what emotions are. The neurologist Antonio Damasio has been a leader in introducing this concept of emotion. The theory fits best with the more visceral emotions such as fear, anger, and joy. The physiologist Joseph Le Doux points out that these unified patterns of emotional response are much the same in humans as they are in simple mammals that he believes are probably unconscious. He concludes from this that emotional feelings, far from being the nub of emotion, are an evolutionary afterthought or frill.

Authors who hold this new theory of emotion often incorporate into it an old theory of emotional feeling called the James-Lange or feedback theory, named after its originators. This theory proposed that emotional feelings come from messages sent back to the brain from the body during the emotional reaction. Quick breathing, palpitation, churning gut, sweaty palms, trembling hands, tense muscles, and alert expression send messages back to the brain that are felt as anxiety or fear. Smiling, laughing, jumping up and down, and squealing send back messages that are interpreted as happiness or joy. We feel sad because we are

weeping and the man feels frightened because he is running away. As William James realized, this is paradoxical. James had several reasons for his theory, but the 'vital point' was his introspection that 'If we fancy some strong emotion, and then try to abstract from our consciousness of it all the feelings of its bodily symptoms we find we have nothing left.' For me, my introspection gives the other answer. Formal studies have confirmed the intuition that facial expression and body posture have some effect on subjective feeling, that smiling makes us feel happier. This is cited as evidence for the feedback theory, but it is equally compatible with the feeling theory, which places no constraints on the possible causes of an emotion. One difficulty for the James-Lange theory is that emotional feelings can be caused by thoughts and images. As we sit in a chair reading we might find that the text has made us feel anxious, joyous, angry, or sexually aroused. Damasio has made the plausible suggestion that these feelings are produced by an 'as if'mechanism by which the brain circuits usually activated by feedback can be activated by the imagination. Another difficulty for the James-Lange theory is that it denies a causative role for emotional feelings: the emotional behavior has begun before the feelings appear.

An important reason for my misgiving about this new concept of emotion is my belief that prosemantic communications and emotional feelings are fundamentally different and serve different purposes, even though they often occur together in humans. Body language and facial expression, as the terms imply, and laughs, squeals, and sobs are communications, they are signals to other people that have evolved to elicit responses from other people. Hear from Umberto Eco, professor of semiotics: 'He met William, and when he learned who he was, he looked at him with polite hostility: not because his face betrayed his secret feelings, I was sure of that, but because he certainly wanted William to feel he was hostile.' In some ways prosemantic signs are more powerful than verbal communications. When people ignore your reasoned dissertation try thumping your fist and shouting, or bursting into tears. Emotional feelings, on the other hand, are signals to the person experiencing them, evolved to influence that person's responses.

There are cognitive or appraisal theories of emotion. They fit best with the less visceral emotions such as gratitude, envy, and remorse. These theories hold that an emotional response is the result of intellectual appraisal of the situation. For

CHAPTER 10

Perception

Abstract: The selective nature of perception is noted, we only notice some things. The automatic monitoring of perception by belief is noted, and the possibility of mistaken judgements of perception. How sensory stimuli are picked up by sensory organs and transferred to the brain as trains of action potentials is understood, but how the brain transcodes these similar trains to the different perceptions of sight, sound, smell, taste, touch, and pain is unknown. There are mysterious elements in how perceptions are projected from the brain to surrounding space and to other parts of the body. This projection may be a factor in the intuition of dualism. The ineffable nature of perceptions is demonstrated. The chapter ends with a note on the nature of mental imagery and its role in thought.

Keywords: Belief, Dualism, Mental imagery, Müller's Law, Perception.

We only notice some things. The visual system is not a passive camera and the auditory system is not a passive sound recorder. Sensory inputs from the eyes and ears pass through relay centres in the brainstem and thalamus to reach the cerebral cortex, where they divide and relay on to higher cortical areas for further processing. The changes made as the inputs pass along these paths constitute bottom-up processing. These changes include simplifying assumptions and short cuts. A line drawing has most of the information contained in a corresponding photograph. Cartoonists make good use of that fact, and so does the visual system. Neural activity in visual pathways is concentrated on outlines and edges. At the same time topdown processing from higher brain areas passes down the sensory paths and affects what passes through them. In this way automatic attention and unconscious effects from memory, expectation, and salience affect what we notice and recognize. We do not know how or where the mental events of conscious

Jonathan Leicester

perception come about within these complex systems, but it is probably later rather than earlier. When perception works well we notice what is important while being at most only vaguely aware of much else. Perception comes with recognition and meaning. In Karl Jaspers' example, when I see a knife I see a tool for cutting.

All our perceptions are monitored by belief, usually with the result that the meanings they come with are granted assent. This recognition is the simplest type of belief, it uses memory, but not cognition. Consider the scene of a city park. The trees, lawns, paths, a gardener digging are seen with simple assent, with a gentle feeling of belief that we usually do not identify. I believe it is conscious, but at the edge of our attention. We do not ask: Is this a park bench, that a lawn, and that a tree. What happens is faster than that. But if the gardener seems to be digging with a knife I will notice my doubt and may have an urge to investigate. I again call on Bertrand Russell for support: 'Beliefs of this class are what are called "judgments of perception" … such beliefs display themselves when the expectations they arouse fail in any way.' In schizophrenia something sometimes goes wrong with the process of taking meaning directly from perception, meaning is taken too far and inappropriate belief is felt too strongly. A delusion results. For example, a patient of Jaspers noticed that two strangers on the street wearing raincoats were Schiller and Goethe.

There is an old law called Müller's Law that says that every system in the brain has its own nervous energy. This means that the visual system sees, the auditory system hears, and so forth. This is not as trite as it sounds. The 'bionic ear' or cochlear implant illustrates the point. It fires the auditory nerve not by sound but by a row of electric stimulators placed in the deaf ear that has lost its natural sound-detecting hair cells. The stimulators detect and respond to sound in the same way that the cochlear hair cells once did, and as the stimulators fire the deaf person hears the sounds that reached the implant. In a more mundane example, a blow on the thumb causes pain but a blow on the eye causes a flash of light. There is a component of circuitry in Müller's Law. Obviously the visual cortex could not be auditory, since it does not get auditory information, but circuitry is not the heart of the law, nor its mystery. Vision, hearing, smell, taste, touch, and pain all reach the brain as trains of similar nerve action potentials. Something must

happen in the brain that makes the visual cortex visual, the auditory cortex auditory, and so forth. The heart of the law is a statement about the mind's mysterious transcoder.

There are two natural errors to guard against, which Müller's law can save us from. One of these is to think that the sensory organs, so apt for their jobs, explain perception: to think that the auditory cortex perceives sound because the ears send it auditory information. The other is to think that the physics of the stimulus explains the sensation; we find ourselves thinking that blue light is blue because it has a wavelength of 420 nm and that a sound is high-pitched because it has a frequency of 8000 Hertz. In truth, we perceive only a fraction of all the waves that surround us. But why as light? And why blue? There is no intrinsic blueness about photons. If the same photons had stimulated rods, our retinal receptors for night vision, instead of cones, the receptors for bright light, we would have seen grey. Many of us have seen pictures of how flowers might look to bees. Müller's law warns us to be cautious, for the bee's brain is very different from ours. Our ears detect a band of air pressure waves. But why is this perceived as sound? And why high-pitched at 8000 Hz and low-pitched at 200 Hz? For all we know it could have been the other way round, and 200 Hz heard as high pitch. A cochlear implant could be designed to produce this effect. Chemical molecules that fit onto one of the olfactory cells in the nose, as a key fits a lock, have an odour. Which odour they have depends on which of the cells they fasten onto. Molecules that are the wrong shape to fit any of the cells are odourless. There is nothing intrinsically smelly about the shape of a molecule, as there is nothing intrinsically warmer about more rapidly moving molecules or higher temperature, and nothing intrinsically painful about a pinprick. All perception is made in the brain by the transcoding of action potentials.

It is perhaps a surprise to find that perceptions are as ineffable as emotional feelings. Think about the descriptions of birdcalls in bird books. Except for a few birds, such as the English cuckoo, that have a call that sounds like a word, the descriptions fail. Likewise, imaginative descriptions of the tastes of wines. To write that something tastes like something else, that the wine has a hint of raspberry, does not describe either taste. You cannot describe to a blind person how 'red' looks. We who see agree that there is a set of things all of a similar

CHAPTER 11

Personality

Abstract: The chapter opens by questioning the role of personality traits in causing behaviour, and decides to work with the common assumption that they have an important role. There is an account of the search for the real units or traits of personality. Some of the traits and dispositions, selected for their particularly direct effect on belief, for example, strong need for closure, are briefly described. There is a comment on the way long-standing occupational roles can sometimes modify personality

Keywords: Belief, Personality, Raymond Cattell.

Confronted by the same evidence, optimists and pessimists, introverts and extraverts, the pugnacious and the timid are likely to form different beliefs that lead to different actions. Do the personality traits cause the beliefs, or are they are merely names for patterns of belief and behaviour? Are we entitled to say that Jones thought we would win because he is an optimist, that Adams wants us to bomb Serbia because he is aggressive, and that Collins believed the advertisement because he is gullible, or are these circular statements, as empty as saying that Butler got drunk because he is a drunkard? After all, by definition an optimist is a person who habitually expresses optimistic assessments and beliefs. Is personality built from more basic processes of instinct, perceptual and motor skill, habits of speech and imagery, intensities of the various emotions? These are difficult questions. Many trait names do seem to have this circular character. Nevertheless, people regard personality traits as being causative, as I will in this chapter.

Not surprisingly, personality has proved to be a difficult subject. There are hundreds of words that name personality types and traits. Psychiatry adds a dozen or so personalities that are outside the usual range and cause impairment

Jonathan Leicester

and distress, among them paranoid, histrionic, narcissistic, antisocial, and passive-aggressive personality disorders. There is an impression that certain groups of different traits tend to occur together, suggesting that they may share some brain process. An example is the Type A personality of cardiology, which is a minor risk factor for heart disease. A Type A person is aggressive, striving, competitive, impatient, poorly tolerant of frustration, and capable of hostility and anger.

There have been determined efforts to test this impression that groups of traits occur together and to discover the underlying structures that may be the biological units of personality, using carefully compiled questionnaires and statistical analysis. Groups of people who tend to answer some of the questions the same way emerge from the analysis. The traits or factors that emerge will not fit exactly with already familiar names of personality traits, but fortunately they fit closely enough for the familiar names to be serviceable. Each trait or dimension is a continuum with a large centre and two polar extremes, for example, most people are neither very optimistic nor very pessimistic. The lay terms for personality types often refer to the poles of particular traits. This is unsurprising, since the most characteristic features of a personality come from where it differs most from the usual.

There are difficulties in designing questionnaires and in applying statistics to a subject as poorly understood and as subjective as personality, and consequent uncertainty in the results. Two of the pioneers in the field, Raymond Cattell and H. J. Eysenck, ended in dispute. Nevertheless, there is some important agreement. The biggest contribution to differences in personality comes from the extraversion –introversion dimension. Emotional stability and intelligence are also important. Recently there has been some settling on a five-factor model, though the field is not finally settled. The ‘big five’ are extraversion–introversion, friendliness–hostility, conscientiousness, neuroticism–emotional stability, and intellect.

Cattell has a larger number of factors, some of which have interesting aspects and deserve comment. *Stable–emotional*. Stable people are mature, steady, persistent, emotionally calm, and realistic about problems. Emotional people are changeable, impulsively emotional, moody, evasive, avoid necessary decisions, and have poor tolerance of frustration, inappropriate fatigue, and a tendency to unrealistic

beliefs. The essence of the factor appears to be a poor ability to control emotions and impulses. Most alcoholics, drug addicts, delinquents and patients with mental illness have low stability. *Excitability* and *Happy-go-lucky–sober*. Excitable people are excitable, tense, restless, and attention getting. It is important in the variability of children, but excitability decreases with age and is unimportant in adults. Like excitability, being happy-go-lucky is common in children and rarer in adults. Shakespeare wrote that youth is full of pleasance and age is full of care. *Assertive–humble*. Assertive people are confident, boastful, aggressive, pugnacious, punitive, vigorous, forceful, and wilful. Humble people are submissive, unsure, modest, retiring, quiet, and obedient. Scientists, artists, pilots, firemen, Olympic champions, and habitual criminals are often strongly assertive. On average men are considerably more assertive than women. The trait has big hereditary and environmental components. Assertiveness feeds on success and is starved by failure. *Tender-minded–tough-minded*. Would you rather be a bishop or a colonel? Are you brought to tears by discouraging circumstances? Do your friends regard you as practical or softhearted? Though only the ninth most influential factor this interesting trait has a big effect, so manifold is personality. The trait is largely culturally determined. Cattell thought the protection and indulgence of parents had a big influence. On average girls and women are considerably more tender-minded than boys and men (See also Chapter 9, tenderness).

Robert Cloninger's work on personality is distinctive, having begun from a theory that has not been confirmed, but the reality of his factors is accepted. Two of his traits, *self-directedness* and *self-transcendence*, are particularly interesting. A self-directed man feels in control of his actions and his fate, he is said to have an internal locus of control. His opposite has an external locus of control, he believes he is at the mercy of other people, circumstances, and fate, and is prone to anxiety, depression, paranoid feelings, and belief in paranormal phenomena and in conspiracy theories. Self-transcendence is the sense of being part of something greater than oneself. It is closely related to spirituality and natural piety (Chapter 9).

There is more to personality than this search for its basic elements. Personality is affected by religious practice, attitudes to religion, sexual preference and practice,

CHAPTER 12

In-Groups and Out-Groups

Abstract: Evolution by group selection is accepted as important in all social animals, and illustrated by examples. In-group and out-group psychology can be seen in young infants, it is an old function of the old brain, it favours the in-group and devalues out-groups, it is related to emotion, symbolism, loyalty, patriotism, honour, pride, aggression, sacrifice, and war. It is involved in personal identity, sense of self, and pride of place. It determines many beliefs.

Keywords: Belief, Child psychology, Evolution, In-group psychology, War.

Most of the beliefs that young men are more or less willing to kill for and to die for stem from belonging to a group. The major story of human history is the struggle between groups. All social animals form groups and evolution by group selection is a factor in their survival. Group selection evolves behaviour that promotes the survival of the group rather than the individual. The honeybee's sting is an example. At first glance group selection looks like a blessing that promotes unselfish behaviour in the service of one's fellows, but the price can be high, because whenever there is an in-group there are out-groups, and a big part of in-group behaviour is being nasty to out-groups. Wars between colonies of ants are common. They are caused by territorial disputes, limited food supply, overcrowding, and the weakness of the attacked colony. Jane Goodall, observing a community of wild chimpanzees, saw a clique form that gradually separated from the main group and attempted to establish its own territory within the group's range. After a time the main group began a slow war of unilateral aggression. Their tactic was to form a raiding party of several males, which would attack and kill any isolated enemy male it found. After three years the war was won, with all

Jonathan Leicester

five breakaway males killed as well as one of the females. Goodall noticed that male chimpanzees had more tendency than females to form in-groups. Factors that can contribute to human wars include disputes over territory, limited resources (oil), overcrowding (Rwanda), weakness of the attacked group, and power-hungry leaders. Also and uniquely, differences of belief can cause humans to fight. This is most obvious with wars of religion, but is often a factor in any war, and was prominent among the causes of the American Civil War.

The psychology of in-group behaviour is one of the innate properties of the mind. Where one's loyalties lie is learnt, but the propensity to join groups is inherited. The psychologists David and Ann James Premack showed that infants only ten months old were aware of groups. At this age infants regard any object that moves actively, for example a clockwork toy, as being alive and moving on purpose. The Premacks made use of this to study the developing attitudes of young infants. The infants expected such objects that looked alike to group together and move together, and such objects that look different not to. They did not expect a mixture of white and black objects to form a group, but if they were shown a mixture of white and black objects that did move together they accepted that the objects formed a group. The infants expected group members to act positively to one another, a rule they had learnt for themselves without explicit instruction. When a child becomes old enough to be a member of a group it keeps these expectations, allowing privileges to its in-group members and devaluing non-members. The Premacks found that on average boys have more tendency than girls to participate keenly in groups.

In-group behaviour is one of the ancient and conserved brain processes that have more ramifications in the human than in simpler animals. Because of our great flexibility and diversity we form multitudinous in-groups. We devalue non-members for things like having the wrong brand of motorbike. Civil strife can be intractable, with new generations of boys learning the loyalties and hatreds of their fathers.

In-group psychology is tied to other old limbic functions. It is related to emotions and feelings of loyalty, belonging, patriotism, honour, affection, pride of self and pride of place. The recognition of similarity among group members has a role, a

similarity that humans often accentuate by enforcing uniform codes of dress and manners. The neurobiology of testosterone probably plays a part. It fosters aggression, loyalty to groups, and the competitive urge.

Paradoxically, in-group psychology is involved in personal identity and sense of self. To have a good sense of identity – to be sure who one is – it is necessary to be accepted by and find a role in a group or society with which one shares a set of core beliefs about values. If this is wrenched away, as it can be by forced displacement to an alien society, or by intense brainwashing, the sense of self can disintegrate, leaving a broken man.

In-groups and out-groups will remain with us. It is unrealistic to hope otherwise, the benefits of membership are too great and the psychology is too deep-laid. The world is not a global village and will probably never be one. Assimilation is fine but can only be hoped for when the separations are not too deep. The most we can expect from the new brain is to learn ways to minimize the damage. In our dealings with out-groups we should remember that our natural tendency is to devalue them. We should also remember that in their eyes we are an out-group. If we attempt to impose ourselves or our ideas we will meet resistance, however strongly we believe in our values and methods.

Despite all the failures there has been some progress. Opportunities occasionally arise. Maintaining and cultivating person-to-person contacts between typical members of different groups, made in situations appropriate for courtesy, is often helpful. There was a good change in the attitudes of many white soldiers when black platoons were first introduced into some units of the American Army. In Australia there has been a rapprochement between Protestants and Catholics during my lifetime.

Carl von Clausewitz' book *On War* is a classic. I read it hoping to learn more about the causes of war. All it taught me was that war was glorious. On the eve of the Battle of Jena, Clausewitz wrote to his fiancée that his whole army was longing for the battle and he looked forward to it with joy as he would to his own wedding day. I wonder what she thought of that. When the battle came his army was pulverized. It is a pity that the new brain is so in thrall to the old. In peace

CHAPTER 13

Symbolism

Abstract: Symbols are things that people (or animals) have learned refer to or stand for something else. They are the basis of nonverbal communication in animals. Humans use symbols that relate to in-group psychology, loyalty, power, and remembrance. Such symbols often have a strong emotional charge, and may lead to overvalued or mistaken beliefs and magical thinking. Graves, flags, and the Christian Eucharist are examples. Some symbols are private and personal. Some symbols are unrecognized and exert their influence through unconscious processes. Other human symbols relate to the new function of language and do not have the same emotional power. Some evidence is presented that symbols work by an 'as if' mechanism, using some of the same neural circuits that the thing symbolized uses. People can think in symbols, for example, a sentence can use the word dog without either the speaker or the listener having a mental image of a dog.

Keywords: Belief, Mechanism of symbolism, Language, Private symbol, Symbol.

A symbol is a thing that refers to or stands for something else. All symbols share this property, and it is this that makes symbols uniquely suitable for communication. Many symbols have powerful emotional associations and easily lead to magical thinking, overvalued beliefs, and wrong beliefs. Here is a story I have been through a number of times. A patient dies from an illness with puzzling features. His doctors ask his family for permission for an autopsy, pointing out that it may help the doctors and their future patients, and that it is the family's last chance to know what happened. The relatives agree with these reasons, and are well intentioned, but refuse permission. They say that the man has already suffered enough. What is happening? People know with their intellect that autopsies do not make dead people suffer, any more than cremations or burials do.

Jonathan Leicester

When the circumstances of death make an autopsy compulsory the family seldom objects and is usually grateful to know the result. The real cause of disquiet is the prospect of giving consent, of being responsible for a preventable autopsy. The thought of it gives them an uneasy feeling with a spooky element. It is magical thinking, symbolism is at work. The corpse is a symbol of the man that was. It may be the most potent symbol in existence, and most people feel its effect. The autopsy does to the symbol what no relative would ever do to the loved person. It is as if for some part of the mind a thing and its symbol are the same. I believe this is exactly how it is. I believe effective symbols activate some of the same brain circuits as do the things they symbolize, creating an 'as if' mechanism. I will present some of my own work that supports this idea later. This can cause problems because a thing and its symbol are not the same and treating them as though they are might lead to unjustified beliefs and irrational actions.

Some symbols resemble the things they symbolize. They are called visual, iconic or natural symbols. One might easily suppose that seeing such a symbol and seeing the thing symbolized would activate some of the same brain circuits. Portraits and statues are natural symbols of the people they represent. Fancy carving the side of a small mountain into the faces of four famous people. People play darts on the portraits of people they dislike. Burning in effigy gives angry crowds pleasure. The photos of dead parents and absent children that are in many homes are symbols of those people, placed there to keep fond remembrance. The fact that something is a symbol is learned, even with iconic symbols, thus identical twins and other pairs of very similar items are not mistaken for symbols of each other.

There are other symbols that have no resemblance to the things they symbolize. In some Buddhist homes, next to a small shrine, there is a small urn with the ashes of the widow's husband. This symbol has no resemblance to the person symbolized, the association is completely learned, yet it serves the same function as our photographs and presumably activates similar circuits of remembrance. Death has no form, but it is symbolized – by no one more powerfully than by Albrecht Dürer, and with good reason. Thirteen of his seventeen brothers and sisters died young, and he lived through epidemics of plague that halved the population of his home city. Remember me from 1505, a plague year, says crowned Death, a

skeleton on a starved horse with scythe and tolling bell (Fig. **13.1**). In another picture Death, a shrouded skeleton with eyes in its skull and holding an hourglass, stands before a healthy youth. In another, most famous of all, Death on his pale horse gallops towards us in the Apocalypse.

Fig. (13.1). King Death on a horse. Charcoal drawing by Dürer (1505). © The Trustees of the British Museum

Symbolism is ubiquitous – flags, anthems, famous battlegrounds, war memorials, graves, the cross of Christianity, the Eucharist, the Last Post, the haj, trade marks, mascots, uniforms, and more. Symbols express their meaning more economically than words do. They are often about emotional things and have a direct line to our emotions and memories. Memory is an important part of symbolism. At the Last Supper when Jesus was introducing the Eucharist he said it was to be in remembrance of him. Many symbols have a long history. They help to bind the past to the present and the future of the group. The fleur-de-lis was on the coat of arms of French kings, and became a symbol of France. It was officially replaced by the tricolour in 1789, but France's past proved harder to kill than its king, and the fleur-de-lis is still with us.

CHAPTER 14

Speech and Language

Abstract: The chapter begins with a discussion of names, descriptive names, and definitive descriptions, with the suggestion that a description becomes a descriptive name, and later simply a name, as it becomes a symbol for the thing it refers to. The issue of naming the several categories of things that we cannot describe accurately is raised. This includes a look at Wittgenstein´s private language argument. The problems of universals, nominalism, and realism are explained and commented on. The influence these issues can have on belief is illustrated with the debate on whether delusions are beliefs, and the issue of moral relativism is raised. The chapter ends with brief comment on misunderstanding through slippage of meaning, and on the Whorf-Sapir hypothesis.

Keywords: Belief, Delusion, Descriptions, Names, Nominalism and realism, Private language argument, Universals.

NAMES, DESCRIPTIVE NAMES, AND DESCRIPTIONS

As promised in Chapter 5, we return to language to discuss several less obvious aspects relevant to belief. There are unfamiliar things that we can describe that we cannot name, and ineffable things that we cannot describe that we can name. What is a description and what is a name? ‘Sir Walter Scott’ is a name, ‘The author of Waverley’ is a definitive description. What is the difference, Bertrand Russell asked, that we make this distinction? From the point of view of logic and grammar he found it hard to find a satisfactory answer. Neurology has the answer to this question. It is a name if it has become a symbol that is stored in the brain’s name bank, otherwise it remains a description. Brain damage restricted to the name bank causes nominal aphasia, when some names are lost or forgotten but descriptions are not. The patients often substitute descriptions for the lost names. For a spade, “You dig with it” and for a cow, “It gives milk.” Many names refer to

some property of the thing they name, they are descriptive names. Near my home are One Tree Plain and Harry's Willow Creek. The tree has gone from the plain and I have no idea who Harry was. With time and familiarity descriptive names lose their descriptive aspect, even if the description is still apt. Mont Blanc is white, but the Middle East happens to be west of me, the words are now simply names. Like the word dog at the end of the last chapter, they are symbols that people use for thinking and communicating.

NAMING INEFFABLE THINGS

There are great categories of things that we name but cannot describe. We cannot describe emotions, feelings, and perceptions (Chapters 9, 10). Science has discovered other things that exist but have never been perceived. Yet we imagine images of them. This is our mind's natural way to give reference to their names. The atom may not really look like a little solar system, but the image has to serve. We image quantum theory's wave function as an uneven cloud in an expanding cone, but this can't be right, because it is an image of many particles, not one. God does not have dimensions, though we may imagine a man painted on a ceiling. In the Bible God is known by metaphor, as a father, a shepherd, a king, and as light. The Bible says what its readers can understand and what language can express. As Calvin said, it accommodates to us.

There is an argument that we are not entitled to name ineffable things. It was made famous by Wittgenstein as the private language argument. The worrying question arises: How can we be sure that we are all using the names for indescribable things correctly and uniformly? Wittgenstein put it this way: 'If I say of myself that it is only from my own case that I know what the word "pain" means – must I not say the same of other people too? And how can I generalize the one case so irresponsibly? Now suppose someone tells me that he knows what pain is only from his case! − Suppose everyone had a box with something in it: we call it a "beetle". No one can look into anyone else's box, and everyone says he knows what a beetle is only by looking at his beetle. Here it would be quite possible for everyone to have something different in his box.' This seems a perfect description of the situation with mental events. They are contained in a box made of bone. The pigeon hole for the remorse beetle in the psychopath's box

is empty, though the psychopath may not know this, or may not tell us. Wittgenstein continues: 'But suppose the word "beetle" had a use in these people's language? – If so it would not be used as a name of a thing. The thing in the box has no place in the language game at all; not even as a something: for the box might even be empty.' He is saying that you cannot have a word for a private object in a public language. To most people this seems wrong. It denies the fact of the frequent use of names that refer to private mental events. We assume that the beetles are similar – that we all have rather similar mental events, and are thus able to use our public language to understand each other. We grant that there is a gap in understanding when the name remorse is spoken to or by a psychopath, and when the patient but not the doctor has experienced vertigo or profound depression, but on the whole the assumption seems to work and we feel no need to delve into the matter any further. If this assumption was unjustified, if we believed that for each of us our mental events were unique, then I could still have my own private names for my mental events, but I could not use these names in a public language, as no one would know what I was talking about. Jaspers' schizophrenic patient, described in Chapter 10, who had the unique body sensation 'es zirrt' demonstrates the point. Wittgenstein did believe the assumption was unjustified, so he had to consider the alternatives: either the public words do not really refer to the mental events or the mental events are not really private. I prefer the assumption.

Another mistake is possible. A man may have the same beetle as other people, but in a box with a different label. When we ask him if he has our beetle he will mistakenly say that he does not. In Chapter 3 it was proposed that this has happened with the belief beetle, with some people who say they never have a feeling of belief, though they have feelings of conviction, confidence, assent, or certainty.

PARTICULARS AND UNIVERSALS

There is a dichotomy of names into the names of particulars and the names of universals. Particulars are individual. Universals are instantiated by any number of particulars that share some property. Universals are not individual. There has been much discussion about what they are. This cat, named Ginger, is a particular. It is

CHAPTER 15

The Role of Belief During Inquiry

Abstract: This chapter deals with the role belief plays in inquiry. Inquiry begins by belief that there is a problem and is terminated by belief that a solution is found or cannot be found. It is the beliefs that count, not the truth of the matter. The process is subject to some voluntary control but in most applications it is automatic. This function of belief was described long ago by C. S. Peirce, but has since received little attention. It gives speed and economy to inquiry, with some sacrifice of accuracy for speed, and is relevant to the purpose of belief.

Keywords: Belief, Charles S. Peirce, Counterfactual thinking, Inquiry.

The different methods of conducting inquiry are all regulated in the same way by belief. Inquiry is started by the belief that there is a problem or question that needs solving or answering. In the typical case inquiry is terminated automatically by the belief the answer is found or cannot be found. It is the beliefs that are operative, not what is true. Common methods of inquiry include asking an authority, finding a reference, examining more closely a surprising perception, making trials of action, and thinking about a problem. How we think about problems is the most interesting, and the one we will now examine.

There are unconscious components in thought. Prominent among these is how thoughts often follow an orderly sequence through association of ideas or association memory. We have no control over what our next thought will be, but it often has some connection to our present thought. Chains of associations can go on below the level of awareness, so occasionally the answer to a problem comes suddenly while we were unaware that we were thinking about it. This is the 'aha!' phenomenon. Induction is another part of thought that is often quick, automatic, and unconscious. A man aged sixty accidentally at a party of teenagers might say

Jonathan Leicester

to himself 'I am out of place here,' but his realization had somehow preceded his inner speech. The conscious part of thought is a late stage in the process and the inner speech is often inessential – many people who are left with loss of language or aphasia after having a stroke still think well and cope well with life.

There is a particular type of thinking that is a crucial part of most inquiry. This is thinking in counterfactual conditionals, often simply called counterfactuals, or, to use a slang synonym, in hypotheticals. A counterfactual is an 'If p, (then) q' (or equivalently 'q if p') conditional where the antecedent p is not actual, or may not be actual, or is presupposed to be false. 'Then' can be omitted, but its meaning remains understood. Some examples may help. If the feeling theory of belief is correct, (then) belief and disbelief are related to emotions and feelings. 'The feeling theory of belief is correct' is the antecedent p that may be false. 'Belief and disbelief are related to emotions and feelings' is the consequent q. If cyanide were not poisonous, (then) it would not have killed him. Here the antecedent 'cyanide is not poisonous' is definitely false. One philosopher, A. R. Anderson, has allowed a wider use of the term, removing the requirement for presupposing that the antecedent is probably false. His example is 'If the patient had taken arsenic, then he would have exactly the symptoms he has.' If this is allowed then most conditionals become counterfactual, which seems reasonable, for they are used in the same way during inquiry, and it might be easier to drop the term counterfactual, and speak simply of conditional reasoning. Counterfactuals about the future might seem less clear, but most philosophers accept them. If I move the knight (then) he could take the bishop. If a large asteroid were to hit Earth it would cause devastation. Some counterfactuals are timeless: From Dostoyevsky, 'If I were God, I would forgive everyone.'

Counterfactual testing has its most primitive expression in inquiry by trials of action. Trial of action evolved as a way to solve a current problem that is confronting the animal or person at the time. It is part of conditioning behaviour in simple animals, with the trying of alternatives when a previous action has had bad or neutral consequences. A laboratory rat solves a maze by trials of action, and thirsty cattle that find one gate to the water trough closed move along the fence to the next gate. In humans counterfactual testing can still take this old form of rather automatic trials of actions, though we usually don't pause to notice this.

If the key won't turn one way we try the other way, if it still won't turn we fiddle it in or out a little. If a piece of the jigsaw puzzle doesn't fit one way we turn it and try again, if it still doesn't fit we try the next piece. Trials of action are like unspoken counterfactual thoughts: If I go to the other gate, then I might get through. If I fiddle the key out a tiny bit and try again, then the door might open.

Humans have taken the evolutionary step from trials of action to solving problems by thinking of counterfactual possibilities in mental simulation. Selecting a move in chess is a good example. This ability to do thought experiments is almost unique to humans, even chimpanzees are very poor at it. It greatly extends the power and scope of inquiry. Trials of action deal only with the present and the immediate future. Thought experiments can consider the distant future, the past, and the purely fantastical – what might happen if a large asteroid were to strike Earth, what might have happened differently had the terrorist attack on the World Trade Towers been prevented, and what it would be like if one could ride on a beam of light.

Inquiry begins with the belief that there is a problem. This step involves processing perceptions and relevant memories and expectations, and seems to begin unconsciously. Some events automatically activate the orienting reflex, drawing attention to the problem, for example, you are ordered to do an unfamiliar task. Often the process is more subtle, the thinker may not be fully alert to the fact he has identified a problem, which he may not express in inner speech. Problems are not always recognized promptly. The next step, if the problem requires inquiry by thought experiment, is to activate or bring to conscious mind an alternative or counterfactual antecedent *p* for testing. This is a key step, because it is unconscious and fallible. It depends on cues and association of ideas or priming, which makes how the problem is expressed or framed important, and may explain why usual, normal and routine acts and events, and the thinker's prejudices, overvalued ideas, and strongly held prior beliefs are all so readily activated. The stronger the cues, the more likely the activation (crossword puzzles depend on this for their effect). There is no control over which alternatives are activated, even during deliberate inquiry, and the inquirer may be unaware of the cues he has used. The next step is to test the counterfactual possibility that has emerged, the inquirer hypothetically adding *p* to his stock of knowledge and

CHAPTER 16

Complexity, Children, Dreams

Abstract: There are difficulties for forming sound beliefs about complex subjects. The evidence about them is often complex, and subject to misinformation, and the beliefs formed about them are often too simple and wishful. The beliefs of young children are fallible in all the usual ways. Some ideas come naturally to children and seem to be evolved adaptations. These may be the sources of the paranormal beliefs that are common among adults. Some parts of the brain are active during dreaming sleep and other functions are inactive. Disbelief is inactive, and the loss of its restraining effect on chains of association of ideas may be why absurdities arise and are accepted.

Keywords: Belief, Child psychology, Mechanisms of dreaming, Misinformation, Multistage reasoning, Paranormal belief.

BELIEF ABOUT COMPLEX SUBJECTS

This chapter deals briefly with three unrelated subjects, starting with the approach to complicated topics. The direct cause of AIDS is the HIV retrovirus, but the general circumstances of a society and the behaviour of each of its individuals are important enabling causes contributing to the epidemic. The direct cause of recent global warming is increased atmospheric carbon dioxide, but this problem has enormously complex ramifications. There are probably many contributory causes for the rise of terrorism, only some of which are present in any particular case. Many of the most important problems societies face are complicated. They often involve complicated causes and suggest many and varied responses, each of uncertain effect. They are intrinsically difficult because the evidence relevant to them is complex. The danger of basing firm belief on inadequate evidence is especially high. Important problems are discussed a lot, paradoxically opening them to the ill effects that repetition and the bias to conform can have on belief.

Jonathan Leicester

Because they are important and complex they are often the targets of mis-information, propaganda, and specious arguments promulgated by vested interests. Other aspects of the nature of belief and its role in inquiry cause added difficulties, especially the limited capacity of attention and working memory, the limitations of counterfactual thinking, the inability to withhold judgement, the poor handling of probability, resort to quick rules of thumb, and the propensity for wishful believing.

The limited capacities of attention and working memory make it impossible to hold all aspects of a complex matter in mind at the same time. It is inevitable that even when all the aspects are considered they are assessed serially, one by one. Because of the inability to withhold judgement, beliefs and doubts occur as the inquiry proceeds, depending on whether the aspect in mind is in favour of or against the proposition. When these feelings are not too strong there may be vacillating belief with indecision, and if some aspect triggers a strong belief, then inquiry is likely to stop though appraisal is incomplete.

In any step by step analysis the first factor to be considered, the most salient or available factor, exerts an unduly strong influence. It has the first chance to cause a belief strong enough to stop the analysis, and it may act as a prior belief that through confirmation bias then distorts and diminishes the later analysis of less salient factors.

Our natural poor handling of probability is another cause of difficulty when using step by step appraisal. When the first factor is deemed probable we tend to assume it is definite as we turn to the next factor, and when we think the first factor unlikely we tend to discount it completely.

When we are asked to decide about a complex issue, when a good analysis would take time and effort, we may resort to a quick rule of thumb, such as that consensus means correctness or a long analysis means a strong analysis. The consensus of expert opinion is not infallible, but is likely to be right and deserves respect. There should be an onus on anyone holding a contrary belief to be careful and to make a case for his opinion. The consensus of a group of like-minded acquaintances is less reliable, it might stem from their shared background or be

influenced by their bias to conform or the effect of their repetition of assertion. 'Length means strength' is interesting. Many experts are reluctant to provide reports that are not 'long enough' for fear that they do not seem thorough, careful, and erudite, or that they will lose to a fuller competing report. Technical jargon and detail may lend a false aura of expertness. Yet the very fact that a report is verbose and long discourages effortful appraisal of its strength. Law courts know these reports well – cynics say they are better weighed than read.

Many of the issues that apply to consideration of any belief apply with more force to beliefs about complex matters. The unfortunate result is that beliefs about these important matters are often too simple, and sometimes simply wrong. One hears patients, relatives, and even doctors nominate in a tone of assured finality some single cause as a complete explanation for a heart attack or stroke, episode of depression, or other illness with complex cause. They often blame long hours of responsible work for someone's having a heart attack, though careful reflection would soon show that this cannot be the whole explanation.

This book is about a complex subject, the nature and purpose of belief. I propose that the intellectualistic theory of belief fails by giving too much weight to the most salient factor, which is the use of evidence concerning propositions, to the neglect of the many other things involved in belief.

BELIEFS AND DISBELIEFS OF YOUNG CHILDREN

There are two components to the development of the mind during infancy and childhood, one physiological and the other psychological. A function is impossible until the circuits that serve it are developed and working. The brain develops rapidly during the first months and years of life, and this partly accounts for the proper sequence of appearance of new functions and abilities. The sequence also has psychological determinants. For example, arithmetic is impossible until language is learnt. When do belief and disbelief begin? We cannot ask the children, they would not understand the question. There is probably a period during infancy when small children are entirely credulous. From its earliest days an infant has opportunities to form simple beliefs from its own experience. For instance, it might believe that rattling its rattle causes a noise.

CHAPTER 17

Illnesses that Affect Belief

Abstract: People with frontal lobe damage often have few and poor beliefs. An important part of the cause of this is their loss of ability for counterfactual thinking. Occasionally a patient with epilepsy arising in the medial temporal lobe reports abnormally intense belief that is free-floating and attaches to everything in consciousness. A similar intense belief sometimes occurs under the influence of mind-altering drugs, and during supreme athletic moments. Odd effects on belief occur in neurological neglect syndromes, and after surgical section of the corpus callosum. There are striking effects on belief in some patients with mental illness, including depression, obsessional hypochondriasis, and obsessive-compulsive disorder. Schizophrenia impinges on belief in several ways. Delusions, reality testing, and empathy are examined, and the possibility that belief is unnaturally intense in some sufferers is raised.

Keywords: Belief, Delusions, Depression, Epilepsy, Frontal lobes, Schizophrenia.

Readers might be concerned that unusual beliefs of patients with neurological or psychiatric illnesses would be abnormal or pathological products of a disordered brain, and would throw no light on the nature of belief. This chapter will argue that the unjustified and irrational beliefs and delusions of patients with some of these illnesses follow from the same mechanisms as the beliefs of other people, and help to illuminate these mechanisms.

NEUROLOGICAL DISEASE AND BELIEF

Frontal Lobe Disease and Counterfactual Thinking

People with frontal lobe damage often show abnormalities of belief. The large

Jonathan Leicester

human frontal lobes are the most obvious difference between the brains of man and chimpanzee, yet they are an enigma. Surprisingly, neurosurgeons can remove considerable parts of either frontal lobe with little harm. But when both frontal lobes are badly damaged in any way unfortunate changes occur. In some patients these changes are dominated by slowness with loss of initiative while other patients are uninhibited. Patients may have loss of concern about the consequences of actions, poor self-control, lack of restraint, loss of anxiety, and loss of tact. They may make inappropriate jokes and out of character sexual allusions and suggestions. Their emotions may be shallow and changeable, and poorly inhibited. They may be impatient of advice and obstinate yet capricious. They lack persistence and concentration. They may become aimless and improvident. Their plans are few and unrealistic. The number and quality of their beliefs about the future are deficient. They don't take the future earnestly, but let things drift along. In the psychology lab they solve problems poorly and they 'switch' poorly. For example, the Wisconsin Card Sorting Test requires subjects to change or switch tactics at times. The subject has to find the changed tactic through trials of action equivalent to 'If I try sorting this different way, then it might work.' Many frontal lobe patients do the test very poorly, they do not 'switch' though they know the old way is no longer working. Readers will appreciate that many of these failings reflect a failure to see alternatives and to foresee consequences.

The frontal lobes are needed for the unique human ability to raise and test counterfactuals by thought experiment. People with severe frontal lobe damage are not stimulated to inquiry automatically when confronted by problems in the way healthy people are. I believe the paucity of counterfactual thinking in frontal lobe patients is a primary deficiency, and not merely the result of emotional flatness, lack of a supposed 'switching' function, or other mechanism. We are all limited in the ability to identify all the relevant counterfactuals of a situation, but many patients with damaged frontal lobes are frankly deficient. The patients are difficult to treat. When his therapist points out the problem the patient hears what she says, but he usually doesn't take it any further.

Medial Temporal or Limbic Epilepsy

An epileptic seizure involves excessive bursts of firing of neurons in some part of the cerebral cortex. The form of the fit is determined by which parts of the cortex are involved. Many seizures are milder than the well-known generalized convulsion. In occasional patients with temporal lobe epilepsy there is an intense feeling of belief and truth. It may not be clear to the patient what it is that is believed so strongly, the feeling is 'free-floating' or attached to everything. The patient MacLean and Stevens studied reported of his attack: "I had the feeling this is the truth and the whole truth; this is what the world is all about." Another patient, a woman aged 43 with previous failed surgery for temporal lobe epilepsy, had a burst of several temporal lobe seizures and for the next 36 hours was euphoric and reported having a new and strong feeling of conviction that things had become clear to her, that she had answers to everything and that "I understand things." (Armin Mohamed, personal communication).

These patients are informative in three ways: the fact that their fits arise in limbic structures supports the thesis that belief is a feeling, the free-floating nature of their belief casts doubt on the intellectualistic theory that belief is necessarily or always an attitude to a proposition, and they show that excessive neural activity in some part of the limbic system can produce abnormally intense belief.

Déjà vu and jamais vu are common symptoms at the beginning of epileptic seizures arising in limbic structures. They provide evidence that perceptions are monitored by belief. Déjà vu is an unexpected and unsettling sense of familiarity when in an unfamiliar place. Jamais vu is an unexpected and unsettling sense of unfamiliarity when in a familiar place. In the disorder of the seizure there is a mismatch between perception, memory, and expectation that produces the unsettling feeling. Many healthy people have occasionally had moments of déjà vu or jamais vu.

Drug Intoxication. In the Zone

William James reported his own experiment with nitrous oxide or laughing gas 'in which a man's very soul will sweat with conviction, and he will be all the while unable to tell what he is convinced of at all.' Similar experiences have occurred

CHAPTER 18

Nature and Purpose of Belief

Abstract: The nature of belief is considered to be a specific faint feeling that is a signal to the person that he or she is believing the item under consideration. Disbelief is a different specific feeling that is a signal to the person that the item is disbelieved. The purpose of belief is to be one of the important guides to practical action. Belief provides a direct prompt to action, and, by its regulation of inquiry, gives speed and economy to reaching decisions. Good and prompt practical action is important for evolutionary fitness. When the criterion of indicating truth is discarded and the criterion of guiding action is adopted many of the puzzling observations about belief fall into place, including the existence of mistaken beliefs and of personally unverified beliefs, the biases of reasoning, the inability to withhold judgement, and the existence of vacillating beliefs. Belief also serves the human need to belong to a group that has a shared set of beliefs about values. The second part of the chapter is a brief personal note on the history of my interest in belief, and a reassessment of two of my own contentious beliefs. The chapter ends with notes on two old philosophical questions: the relations between belief, knowledge, and opinion; and theories of truth. These are looked at from the perspective of the feeling theory of belief.

Keywords: Feeling theory of belief, Knowledge, Opinion, Truth.

This chapter summarizes my conclusions about belief. The major theories about the nature of belief have been reviewed, leading me to endorse the feeling theory of belief. This theory makes no definite presumptions about the causes, effects, and purposes of belief. It invites an inquiry into these. It suggests that belief did not evolve to be a guide to abstract truth, as belief is such an unreliable guide to truth. It is more likely that belief evolved to guide practical action. Good practical action is important for evolutionary fitness. When the criterion of indicating truth is discarded and the criterion of guiding action is adopted many of the puzzling observations about belief fall into place.

Jonathan Leicester

The many factors apart from evidence that contribute to causing beliefs include the believer's prior beliefs, emotional state, personality, previous experience, and wishes, as well as the shared beliefs of the believer's community, the believer's loyalty to his in-group, his acceptance of the testimony of authorities and his uncritical acceptance of assertions. Belief can be affected by the power of repetition, by the power of language and of nonverbal communication, and by the probable existence of natural credulity. Belief has evolved in such a way that direct experience has a stronger effect on forming beliefs than testimony has. Testimony can be unreliable or even deliberately deceiving, there is a risk in believing it too readily or too strongly.

Belief and disbelief work automatically and are largely involuntary. The feelings come when they come, and they often come quickly. We have very limited ability to decide what to believe, although it so happens that there is a bias to believe what we would like to be true.

The intensity of belief and disbelief differs in strength from item to item. Belief is usually a weak feeling that is hardly noticed and is not expressed in inner speech. Strong feelings of belief are more noticeable, and may be recognized as feelings of conviction or certainty. Disbelief is a stronger feeling that is more noticeable than belief and draws attention more strongly to the item concerned. There is some evidence that the intensity of belief is pathologically strong in a few abnormal situations, particularly in some types of temporal lobe epilepsy, in some types of drug intoxication, and perhaps in people with schizophrenia.

Belief is a slightly pleasant feeling. We enjoy believing. Disbelief is a slightly unpleasant feeling which we prefer to avoid. We like to dispel doubt. Disbelief is one of the triggers that initiates inquiry, including inquiry by counterfactual thinking about alternative possible explanations.

The speed of belief enables it to carry out its important role in inquiry and to give speed and economy to inquiry and decision. Belief inhibits, blocks, or stops further inquiry into the believed item. Reaching a belief is the most important switch that terminates inquiry – it is no coincidence that it is called reaching a conclusion. It allows the mind to move automatically and economically to the

next matter.

The feeling theory suggests mechanisms for some of the unconscious biases of reasoning, including overconfidence of correctness and confirmation bias. It suggests possible reasons for wishful believing, for vacillating belief, for the difficulty with multifactorial reasoning, for the inability to withhold judgement, and for the delusions of mental illness.

All mental events that catch attention are monitored by the belief-disbelief system. Everyone monitors their perceptions, emotions, feelings, thoughts, and actions, usually by granting mild assent, occasionally by more noticeable disbelief that stimulates inquiry. This is automatic and effortless.

The physiology of belief and disbelief is not known. There is some evidence that it involves limbic and frontal areas that also serve other feelings and emotions, attention, and working memory. Perhaps there are facilitatory connections between the systems for belief and for desire, since people so often believe what they wish was true, but I offer that suggestion as a speculation.

The ultimate purpose of belief is to influence decisions about action. Practical action often requires quick decisions in the absence of conclusive evidence and when it would be no help to withhold judgement. Belief and disbelief contribute to quick decisions and decisive action in two ways. First, they give speed and economy to inquiry. Secondly, once a belief has formed it is often a direct prompt to action. Reason is the best guide to truth, but because of its very strength, its separation from feelings and emotions, it is a weak motivator. It is also slow.

Actions are guided by various influences including belief, cognitive assessment, conditioned responses, innate reflexes, unconscious mental processes, and emotional feelings, especially anticipatory feelings of desire, anxiety, fear, and belief about the future or expectation. Cognition, belief, anxiety, and fear can have restraining influences on desire. It may be best if this restraint is not too strong. For survival in evolution it may be bad to think too precisely on the event and to let I dare not wait upon I would. Perhaps this is why the bias to believe what we wish was true is so strong. Some philosophers have proposed that belief prompts action only indirectly, through the mediation of some desire-like state, but this

CHAPTER 19

Conscience

Abstract: Conscience depends on beliefs about values. The point of the chapter is that conscience is fallible, being based on fallible beliefs, though some people sometimes regard conscience as infallible. The chapter examines the implications of this, without really solving the dilemma.

Keywords: Belief, Conscience.

Oliver Cromwell was justified when he wrote to his Scottish enemies: 'I beseech you, in the bowels of Christ, think it possible you may be mistaken.' He never thought of the corollary 'Think it possible I may be mistaken.' He believed all his beliefs, as I believe all my beliefs. Yet everyone else has some beliefs that I believe are mistaken. The logical conclusion is that among my beliefs there are some that are mistaken. Which ones? Who knows? Not I. It means that I should not fully trust my beliefs.

There is an even more uncomfortable corollary, which is that I should not fully trust my conscience, because my conscience is derived from a subset of my beliefs. Conscience is the bad feeling that comes when we contemplate or commit some act that transgresses our moral or ethical values; values that are derived from our beliefs about moral and ethical matters. Often these beliefs are shared beliefs of our society and our in-groups that we were taught and came to accept during our childhood. That conscience is not infallible is confirmed by the existence of atrocities committed according to the dictates of conscience.

Many people believe that their conscience is the only guide they need for their actions. This strategy is often adopted by humanists. In its modern meaning

Jonathan Leicester

humanism is a secular system that denies divinity and all supernatural authority and holds that people are reasonable and able to form their own moral sense. I believe this is a risky strategy for several reasons. The humanist often feels that he has worked out right and wrong by the power of his own reasoning, but he underestimates how difficult it is to do this, he underestimates the power that influence and authority have on his thought and belief, and he underestimates the power of the irrational factors that contribute to belief. Our society has been steeped for centuries in the influence of Christianity, so it is easy for us to mistakenly believe its tenets are self-evident. As society becomes secular it is easy to lose sight of where these tenets came from and to think that we have reasoned them out ourselves.

Some of the greatest philosophers have used reason to explore morality without reaching a final conclusion. Diderot, the French philosopher and encyclopedist, pondered later in his life how to derive a natural ethic and admitted his failure, writing 'I have not even dared to write the first line … I do not feel myself equal to this sublime work.' After years of effort, Kant believed that he had proved absolute moral law through reason, in his categorical imperative: 'Act only according to a maxim by which you can at the same time will that it shall become a general law.' It means 'And as ye would that men should do to you, do ye also to them likewise' (Luke 6: 31). Did this teaching of Jesus influence Kant's reason? I do not know. He had a devout Pietist upbringing, and influence can creep in unnoticed. Ethicists still struggle with the task. In tune with the temper of our times, most now avoid a prescriptive solution and fall back on some variant of utilitarianism and the conclusion that we can only do our best.

One unobvious Christian tenet is that it is not only actions that have moral value, thoughts and feelings also matter. Anger and lust are the two examples given in the Sermon on the Mount. Even when they don't lead to actions, bad thoughts coarsen the mind. We can only try, for thoughts come unbidden. Another teaching that we are even less likely to reason out independently is to love our enemies and do good to those who hate us. This is counterintuitive and unbiological. Because of how our old brain works we undervalue out-groups and get satisfaction from revenge. Jesus makes a stunning appeal to have us use the new brain to do better. Unfortunately his ideal is sometimes impractical. Invaders must be resisted, and

tyrants arise who only understand power and force. But the conflicts of private life are often less imperative, and even in public life the achievements and lack of vitriol of the later years of Nelson Mandela, Gorbachev, and Sadat show something like this tenet at work. Sadat's overoptimistic efforts to bring peace to the Middle East produced enemies at home and we know that the men who murdered him had intense beliefs and clear consciences.

By logical necessity most individuals hold most of the beliefs that are widely held in their society. It is a truism that the accident of a person's place of birth is likely to have a big influence on her beliefs, including her beliefs about moral and ethical values. Most Australians subscribe to a generally Christian ethic with a few minor modifications. Other societies have thought pride a virtue, humility a weakness, revenge a virtue, and war a glory. In old Tibet frank and courageous confession of bad deeds was deprecated as revealing a lack of proper fear and respect, while to forgive and forget indicated weakness and inconsistency. Our culture believes there is virtue in truth, though we know that some truths are better left unsaid. Some cultures take this exception further. They believe courtesy is important and find our frankness insensitive. Which do we believe is more important, the individual or the State? It is an old debate. Our society, influenced by Christianity, believes in the importance of the individual and in human rights. We believe more state-oriented societies often deny their citizens basic rights. When we tell them this they believe we are interfering. Our society does not believe the extended family is very important, but in some societies it is the fundamental unit of the community. We condemn nepotism as an abuse of power, they regard it as natural and find its absence anomalous. Australians do not understand hierarchical societies and we tend to disapprove of them. Most of us no longer think virginity is terribly important. In some societies brides found to have erred have been stoned to death by men with clear consciences. Achilles is self-indulgent, boastful, and vengeful – yet Homer as narrator calls him excellent and admirable. The conclusion is inescapable that given a different accident of birth the same humanist would work out right and wrong quite differently.

All this does not prove a case for moral relativism. The other possibility is that there are things that are right and things that are wrong but people and societies are liable to make mistakes about them. Even shared beliefs can be mistaken. I

CHAPTER 20

Dualism and Immaterial Mind

Abstract: The final chapter is on the question of immaterial mind, the ghost in the machine. Some time is spent on Cartesian dualism, partly because Descartes is often misquoted and misunderstood, but all the main views are examined, without reaching a definite conclusion. I believe we do not know, we only have beliefs about this, and our beliefs depend on where our faith lies. The book ends by giving some of the implications that I believe follow from this uncertainty.

Keywords: Arthur Koestler, Belief, Cartesian dualism, Descartes, Eliminativism, Epiphenomenalism, Gilbert Ryle, Materialist theories of mind, Property dualism.

There seems to be something immaterial about mind, as if mind is a ghost in the machinery of the brain. Is this intuition of dualism correct? Years ago a visitor to our hospital, an expert on brain scans, agreed to speak on the subject of this ghost. "What a shame it was," he began, shaking his head sadly, "that Arthur Koestler, whose life had seemed so worthwhile, ruined it by doing such a dreadful thing at the end." Then he slipped into his usual lecture on his collection of scans. The mind-body problem was not his topic, surely we can make a better attempt.

As many readers will know, the expression 'The Ghost in the Machine' comes from the Oxford philosopher Gilbert Ryle. We need to know something about Ryle, because it turns out that who you are and where and when you lived has a bearing on whether you believe in the ghost. Ryle developed his ideas between the two World Wars, during the heyday of behaviourism, in a place and time that was confident in mankind and in the triumph of science, and condescending or dismissive towards Christianity.

This intellectual climate is obvious in Professor Ryle's book *The Concept of*

Jonathan Leicester

Mind, which appeared in 1949. It opens with a vigorous attack on Cartesian dualism. Descartes' theory, according to Ryle, is that that each of us has a body and a mind, harnessed together in life, but the one material and subject to mechanical laws, the other not. Minds are not in space, they are immaterial. After death the mind may continue to function. Then on page fifteen Ryle wrote:

> Such in outline is the official theory. I shall often speak of it, with deliberate abusiveness, as 'the dogma of the Ghost in the Machine'. I hope to prove it is entirely false, and false not in detail but in principle. It is not merely an assemblage of particular mistakes. It is one big mistake, and a mistake of a special kind. It is, namely, a category-mistake. It represents the facts of mental life as if they belong to one kind of category (or range of types of categories), when they actually belong to another. The dogma is therefore a philosopher's myth.

Of course, he proved no such thing. The mind-body problem has been with us since Plato and wasn't about to yield to Ryle. He was soon challenged. One of his challengers was Arthur Koestler, who believed in an immaterial mind. Koestler was raised in Hungary. He was an idealistic young journalist when he went to Spain to report on their civil war for a British paper. The Spaniards put him in gaol. Unlike many Western intellectuals of the time, Koestler came to realize the nature of Stalin's regime and he left the communist party. He incorporated his experiences into his novel *Darkness at Noon*. Later he became interested in the history of science and the nature of creative thinking and wrote *The Act of Creation*, and in Eastern mysticism, writing *The Lotus and the Robot*. He was prominent in a society for euthanasia. In his old age he got Parkinson's disease and then leukemia. When he was seventy-eight he and his wife together took their lives. In 1967 he published a book called *The Ghost in the Machine*. By then the world had seen the atomic bomb exploded and was living in the Cold War. Socialism seemed to have failed, faith in the promise of science was less, ecology was a worry, and capitalism could look ugly. The intellectual climate had become less optimistic. Koestler's book reflects these changes. It is a vigorous attack on the radical behaviourists and their portrayal of man as a soulless stimulus-response automaton. The book is entertaining but unfair. Here he is on Ryle:

> Professor Ryle is a prominent representative of the so-called Oxford School of Philosophy, which, in the words of one of its critics, 'treats genuine thought as a disease'. This curious philosophical aberration is now on the wane … Regardless of the verbal acrobatics of Behaviourists and their allies, the fundamental problems of mind and matter, of free will *versus* determinism, are still very much with us, and have acquired a new urgency … because of their direct bearing on political ethics and private morals, on criminal justice, psychiatry, and our whole outlook on life. By the very act of denying the existence of the ghost in the machine – of mind dependent on, but also responsible for, the actions of the body – we incur the risk of turning it into a very nasty, malevolent ghost. (p. 202)

What Koestler meant by a nasty malevolent ghost was explored more fully by Dostoyevsky, whose grim conclusion was that if there were no soul and no God then nothing would be immoral, self-interest and temporal power would rule unbridled, and everything would be permitted. It is not so simple. Some atheists behave very well and some religious people behave atrociously. Koestler had experienced the truth that when states have attempted to suppress religion, as Stalin's Russia did, the results have been bad.

Koestler developed an idiosyncratic theory of hierarchies of mental function to support his belief in the ghost. It is marred by mystical reasoning, and does not prove his case. Here are two samples:

> They are epitomized in what Freud called the oceanic feeling: that expansion of awareness which one experiences on occasion in an empty cathedral when eternity is looking through the window of time, and in which the self seems to dissolve like a grain of salt in a lot of water. (p. 189)

> I have tried to show that throughout the ages the great innovators in the history of science had always been aware of the transparency of phenomena towards a different order of reality, of the ubiquitous presence of the ghost in the machine – even such a simple machine as a magnetic compass or a Leyden jar. Once a scientist loses this sense of mystery, he can be an excellent technician, but he ceases to be a savant. (p. 220)

Descartes, of course, is one of the really great men. For this reason, and because

Appendix. The Brain: Structure and Function

ANATOMY OF THE BRAIN

(Fig. **A.1** & **A.2**). The working parts of the brain are its nerve cells or neurons. They are the components of the brain's electric circuits. There may be 100 billion neurons in the human brain. They are arranged in groups so that the brain is to some extent made up of easily recognized separate structures. The two cerebral hemispheres are the biggest parts of the brain. They are separated from each other by the deep interhemispheric fissure. The base of each hemisphere is connected to the brainstem. The brainstem transmits information between the brain and the body. It also has functions of its own and is essential for consciousness. The cerebellum is attached to the back of the lower brainstem. Its main function is motor coordination. In a fresh brain collections of neurons look grey and collections of fibres or axons look white. Each cerebral hemisphere has a sheet of grey matter over its surface called the cerebral cortex. In the human it is deeply folded because its area has become so great. The folds are called gyri and the clefts between them are called sulci or fissures.

The cerebral hemispheres are divided into the frontal, temporal, parietal and occipital lobes. The posterior part of the frontal lobe (the precentral gyrus and regions just anterior to it) serves motor functions – the planning and execution of voluntary movements. The remainder of the frontal lobe serves various components of the workings of the mind. Beneath the cerebral cortex there is a large zone of white matter. Most of these axons transmit information from one region of the cortex to another. The main connection between the cerebral hemispheres is a fibre bundle called the corpus callosum, situated at the bottom of the interhemispheric fissure, just below the cingulate gyrus (Fig. **A.2**). Deep in each hemisphere there are the grey matter nuclei of the basal ganglia (the putamen and the caudate nucleus) and the thalamus. These deep nuclei have extensive two-way connections with the cortex. Their functions are complex. Sensory information is relayed in the thalamus on its way to the cortex.

On the medial side of the cerebral hemispheres, in a rim or limbus around the root of the hemisphere, is the limbic lobe – the uncus, amygdaloid nucleus, parahippocampal gyrus, hippocampus, and cingulate gyrus. This is the oldest part of the cortex in evolution. Its functions include big roles in memory and emotion. The cerebral hemispheres are 'crossed', that is, the left hemisphere receives sensory input from and controls movement of the right side of the body. In vision, it sees everything to the right side of the point of gaze, that is, the right half of vision of each eye. Each hemisphere has a different role in many higher functions. In most people the left hemisphere controls language. Because of this, and its control of the preferred right hand, it is called the dominant or major hemisphere. The right

hemisphere, although it controls spatial relations and has other important functions, is called nondominant or minor.

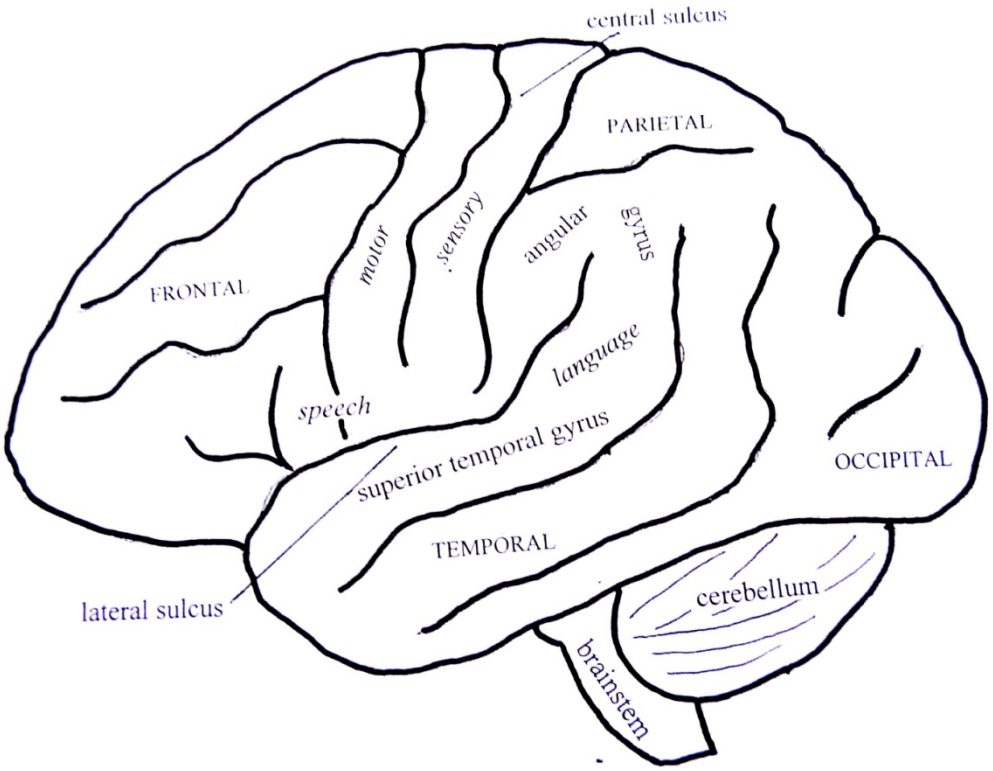

Fig. (A.1). Diagram of left lateral view of brain. The lateral sulcus is often called the Sylvian fissure. The central sulcus is often called the Rolandic fissure.

The brain is divided into systems that are to some extent distinct and separate. Although every neuron has its own function and its own specific pattern of firing responses, neurons work together in groups and many groups take part in any complex action of the brain or of the mind. In this way a set of systems exists to serve the corresponding set of functions. To some extent these are separate distinct systems and functions, though they are interdependent and overlapping. For example, the motor system coordinates and executes movements. There are systems serving consciousness, sensory systems serving sensation and each of the special senses (vision, hearing, taste, smell), systems for motivation, for the emotions, for memory, for language, and so on. There may be systems for believing and disbelieving, though our knowledge of them is limited.

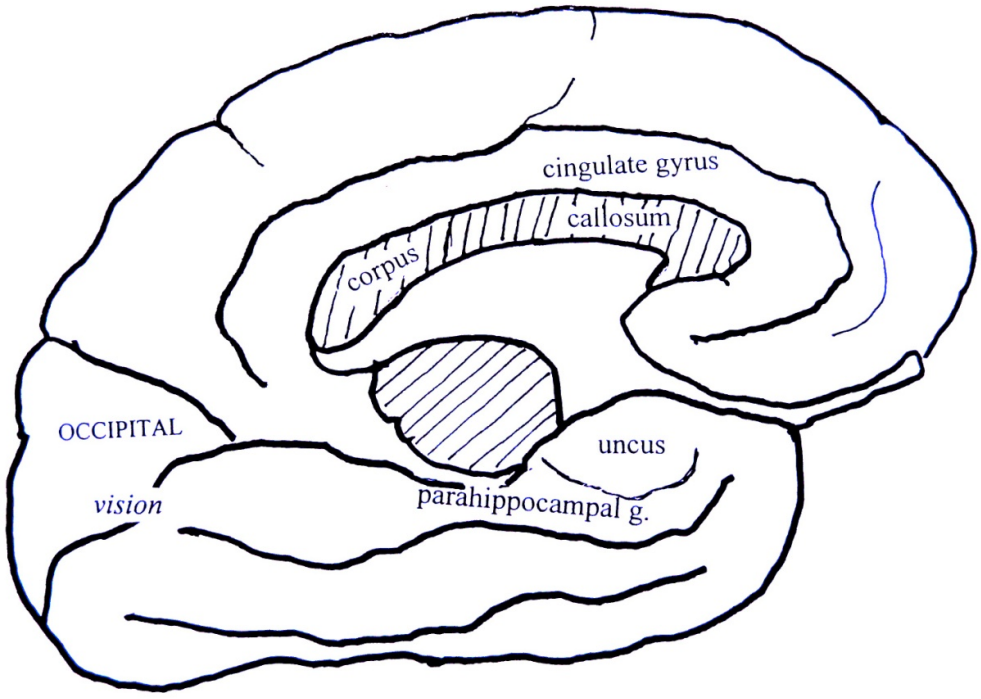

Fig. (A.2). Diagram of medial surface of left cerebral hemisphere, brainstem cut away, corpus callosum cut. The amygaloid nucleus is in the uncus. The hippocampus is hidden behind the parahippocampal gyrus.

THE NEURON

Each neuron has a cell body and short processes, its dendrites, and another process, its axon. The axon is thinner and often longer than the dendrites and has branches, often numerous. A neuron may have as many as a hundred thousand connections with other neurons. It receives messages from neurons that have axon terminals on its body and dendrites, and transmits messages down its axon to other neurons. The unit of transmission of the axon is the action potential, which is formed at the cell body and travels down the axon as a brief electrical impulse. The action potential occurs, or the neuron 'fires', whenever the summated effects of all its inputs stimulate its cell body above a certain level. The action a neuron has depends on how frequently it is firing, on the state of excitation of the neurons it transmits to, and on whether it is an excitatory or an inhibitory neuron. When excitatory neurons fire rapidly they tend to increase the firing of neurons they transmit to. When inhibitory neurons fire rapidly they tend to decrease the firing of neurons they transmit to.

The point where an axon terminal contacts the next neuron is called the synapse. The action potential ends at the axon terminal. Its arrival there causes the axon terminal to discharge a

Notes

The four introductory quotations can be found at Russell, 1921, p. 231, Amis, 2008, p. 11, Parks, 2002, p. 140, and Camus, 1943, pp. 19-20.

CHAPTER 1. THE PROBLEM WITH BELIEF

Locke's definition is at Book 4 chapter 15, p. 356 of the Essay, Locke, 1961.

CHAPTER 2. STRANGE SHARED BELIEFS

Culture-bound Psychoses

Shen-k'uei is described by Wen and Wang, 1981.

Epidemic Hysteria

There is a more formal treatment of witchcraft in Macfarlane, 1970.

The epidemic of shell shock is described by Butler, 1943, who took the casualty figures from the records of The British Expeditionary Force.

The course of the epidemic of RSI at Telecom Australia is reported by Hocking, 1987.

Myths and Legends

The Baryulgil myth is recorded by Burnum Burnum, 1988, himself an indigenous Australian.

Lucien Lévy-Bruhl, 1910, a French anthropologist, promoted the idea that primitive or prelogical thought is fundamentally different from modern Western thought and is the product of a different mind from a culture that had not evolved through the stages passed through by our culture. This is not about formal logic, but concerns the uncritical acceptance of contradictions, incompatibilities, and mystical shared beliefs. It has since been accepted by some (Carveth Read, 1920) and denied by others (F. C. Bartlett, 1923). With the new understanding that through neural plasticity every individual's brain is moulded by that individual's experience the debate is seen in a new light and can perhaps be allowed to rest.

Priam's remark is from The Iliad 3, 164. In another translation Priam says to Helen: "Dear child, come here and sit in front of me … I bear you no ill will at all: I blame the gods." Calasso does not use the term free will in his analysis, that is my interpretation of what he

wrote.

Rumours and Conspiracy Theories

Virgil's comment on Rumour is in The Aeneid, Book 4, at p. 102 of the 1976 Penguin edition translated by G. R. Wilson Knight.

CHAPTER 3. FOUR THEORIES OF BELIEF

This chapter draws on material presented more formally in Leicester, (2008).

The Intellectualistic Theory of Belief

The statements that show the writers hold the intellectualistic theory are in Locke, 1996/1690, p. 356, Le Doux, 1996, p. 105, Güzeldere, 1995, p. 792, and Searle, 1997, p. 115.

The two polls of belief in paranormal phenomena are in Gallup & Newport, 1991, and Musella, 2005.

For Freud, Tolstoy and others see the notes to Chapter 5, section on intelligence.

The intentionalist theory of belief is associated with Donald Davidson, reference Davidson, 1985. Ariela Lazar, 1999, has discussed the issue of the reasons for false beliefs, and stressed the limitations of the intentionalistic theory.

The appraisal theory is associated with Magda Arnold, 1960.

The Dispositional Theory of Belief

The quotation explaining the dispositional theory is from pp. 191-192 of Wittgenstein, 1963.

Griffiths, 1963, analyses the circular nature of accepting that our thoughts and assertions enable us to recognize our beliefs.

Authors who use the term judgement rather than belief include Kant, Brentano, Jaspers, and Daniel Kahneman's group. Ginsberg, 1972, is clear in restricting judgement to observable effects of belief.

The Feeling Theory of Belief

The quotations from Hume explaining the feeling theory, in the order cited, are in book 1, part 3, section 8, p. 153; book 1, part 4, section 1, p. 234; book 1, part 3, section 7, p. 146; book 1, part 3, section 7, p. 146; book 1, part 4, section 2, p. 258 of Hume, 1924/1739.

The quotations from Bertrand Russell are from Russell, 1921, pp. 232-233, 250, 234.

The quotation from Walter Bagehot is from p. 326 and p. 329 of Bagehot, 1891.

The quotation from William James is on p. 283 of Volume 2 of James, 1890. James's writings on belief are complex and in other places he seems to take a different view.

The quotation from Peirce is on pp. 10-11 of Peirce 1957/1877.

For Luther's view of the relation of faith and trust see McGrath, 1994, pp. 67, 127-129.

The quotation from Quine is on p. 3 of Quine & Ullian, 1970.

Boring, 1953, discusses skill and training in introspection in his history of introspection in psychology.

The comment on the sleeping man is from Ginsberg, 1972, p. 5. Other influential writers who have turned away from the feeling theory because of the fact that beliefs have duration include Wittgenstein, 1963, p. 191, Scheffler, 1965, p. 76, Price, 1969, p. 244, Needham, 1972, p. 104, and Armstrong, 1973, p. 7.

The study of belief using functional brain scans is by Harris *et al.*, 2008.

Eliminativist Theories of Belief

Paul Churchland, 1981, argued the case that belief is a theoretical construct from folk psychology.

The radical behaviourist perspective is explained by Moore, 2013.

CHAPTER 4. THE EVOLUTION OF MIND

Some authors have denied the reality of group selection. See notes to Chapter 12.

Gould & Gould, 1988, report experiments on conditioned behaviour in bees.

The behaviour of lizards is reviewed by MacLean, 1990.

Lehrman, 1964, reports inducing reproductive behaviour in ring doves with administered hormones.

For the evolution of the ability for thought experiments see Suddenhoff & Corballis, 1997.

Dual process theory was proposed in 1975 by Wason and Evans, its development can be

References

Abercrombie, M.L. (1974). *The Anatomy of Judgement. An Investigation into the Processes of Perception and Reasoning.* London: Pelican Books. (Original work published 1960)

Al Ramiah, A., Hewstone, M. (2013). Intergroup contact as a tool for reducing, resolving, and preventing intergroup conflict: evidence, limitations, and potential. *Am. Psychol, 68*(7), 527-542. [http://dx.doi.org/10.1037/a0032603] [PMID: 24128316]

Amis, M. (2008). *The Second Plane. September 11: 2001-2007.* London: Jonathan Cape.

Anderson, A.R. (1951). A note on subjunctive and counterfactual conditionals. *Analysis, 12*, 35-38. [http://dx.doi.org/10.1093/analys/12.2.35]

Argonov, V.Yu. (2014). Experimental methods for unraveling the mind-body problem: the phenomenal judgment approach. *J. Mind Behav, 35*, 51-70.

Armstrong, D.M. (1973). *Belief, Truth and Knowledge.* London: Cambridge University Press. [http://dx.doi.org/10.1017/CBO9780511570827]

Armstrong, D.M. (1968). *A Materialist Theory of the Mind.* London: Routledge and Kegan Paul.

Arnold, M. (1960). *Emotion and Personality* (Vol. 1, p. 189). New York: Columbia University Press.

Asch, S.E. (1987). *Social Psychology.* Oxford: Oxford University Press. (Original work published 1952)

Bagehot, W. (1891). On the Emotion of Conviction. In: Morgan, F., (Ed.), *The Works of Walter Bagehot* (Vol. 2, pp. 326-338). Hartford, CT: The Travellers Insurance Company. (Original work published 1871)

Bain, A. (1888). *The Emotions and the Will* (3rd ed.). London: Longmans, Green.

Bartlett, F.C. (1923). *Psychology and Primitive Culture.* Cambridge: Cambridge University Press.

Bartlett, F.C. (1932). *Remembering. A Study in Experimental and Social Psychology.* Cambridge: Cambridge University Press.

Beck, F., Eccles, J.C. (1992). Quantum aspects of brain activity and the role of consciousness. *Proc. Natl. Acad. Sci. USA, 89*(23), 11357-11361. [http://dx.doi.org/10.1073/pnas.89.23.11357] [PMID: 1333607]

Becker, C.L. (1932). *The Heavenly City of the Eighteenth-century Philosophers.* New Haven, CT: Yale University Press.

Beckman, L. (1970). Effects of student's performance on teachers' and observers' attributions of causality. *J. Educ. Psychol, 61*, 76-82.

[http://dx.doi.org/10.1037/h0028821]

Bejjani, B-P., Damier, P., Arnulf, I., Thivard, L., Bonnet, A-M., Dormont, D., Cornu, P., Pidoux, B., Samson, Y., Agid, Y. (1999). Transient acute depression induced by high-frequency deep-brain stimulation. *N. Engl. J. Med, 340*(19), 1476-1480.
[http://dx.doi.org/10.1056/NEJM199905133401905] [PMID: 10320386]

Bennett, M.R., Hacker, P.M. (2003). *Philosophical Foundations of Neuroscience.* Malden, Mass.: Blackwell.

Bernstein, J. (1991). *Einstein* (2nd ed.). London: Fontana Press.

Berrios, G.E. (1991). Delusions as 'wrong beliefs': A conceptual history. *Br. J. Psychiatry, 159* (Suppl. 14), 6-13.

Berrios, G.E. (1996). *The History of Mental Symptoms. Descriptive psychopathology since the nineteenth century.* Cambridge: Cambridge University Press.
[http://dx.doi.org/10.1017/CBO9780511526725]

Blackwood, N.J., Howard, R.J., Bentall, R.P., Murray, R.M. (2001). Cognitive neuropsychiatric models of persecutory delusions. *Am. J. Psychiatry, 158*(4), 527-539.
[http://dx.doi.org/10.1176/appi.ajp.158.4.527] [PMID: 11282685]

Blair, W., Jarvis, G., Petty, R.E. (1996). The need to evaluate. *J. Pers. Soc. Psychol, 70*, 172-194.
[http://dx.doi.org/10.1037/0022-3514.70.1.172]

Blank, H., Musch, J., Pohl, R.F. (2007). Hindsight bias: On being wise after the event. *Soc. Cogn, 25*, 1-9.
[http://dx.doi.org/10.1521/soco.2007.25.1.1]

Bleuler, E. (1950). *Dementia Praecox or the Group of Schizophrenias.* New York: International Universities Press. Zinkin, J., Trans.(Original work published 1911)

Bloom, H. (1994). *The Western Canon.* New York: Harcourt Brace.

Bloom, P. (2004). *Descartes' Baby: How the Science of Child Development Makes us Human.* New York: Basic Books.

Blount, G. (1986). Dangerousness of patients with Capgras syndrome. *Nebr. Med. J, 71*(6), 207.
[PMID: 3724919]

Boring, E.G. (1953). A history of introspection. *Psychol. Bull, 50*(3), 169-189.
[http://dx.doi.org/10.1037/h0090793] [PMID: 13056096]

Bowen, M. (2005). *Thin Ice. Unlocking the Secrets of Climate in the World's Highest Mountains.* New York: Henry Holt.

Braithwaite, R.B. (1933). The nature of believing. *Proc. Aristot. Soc, 33*, 129-146.
[http://dx.doi.org/10.1093/aristotelian/33.1.129]

Bressler, S.L., Freeman, W.J. (1980). Frequency analysis of olfactory system EEG in cat, rabbit, and rat. *Electroencephalogr. Clin. Neurophysiol, 50*(1-2), 19-24.
[http://dx.doi.org/10.1016/0013-4694(80)90319-3] [PMID: 6159187]

Burnkrant, R.E., Howard, D.J. (1984). Effects of the use of introductory rhetorical questions *versus* statements on information processing. *J. Pers. Soc. Psychol, 47*, 1218-1230.
[http://dx.doi.org/10.1037/0022-3514.47.6.1218]

Burnum Burnum. (1988). *Burnum Burnum's Aboriginal Australia: a Traveller's Guide.* Sydney: Angus and Robertson.

Butler, A.G. (1943). *The Official History of The Australian Army Medical Services in the War of 1914-1918* (Vol. 3, pp. 56-147). Canberra, Australia: The Australian War Memorial.

Caesar, J. (1996). *The Gallic War.* Oxford: Oxford University Press. Hammond, C., Trans.(Original work published 50 BC)

Calasso, R. (1994). *The Marriage of Cadmus and Harmony.* London: Vintage. Parks, T., Trans.(Original work published 1988)

Camus, A. (1961). Letters to a German Friend. Fourth Letter. *Resistance, Rebellion and Death* (pp. 20-21). London: Hamish Hamilton. Originally published 1943

Cattell, R.B. (1965). *The Scientific Analysis of Personality.* Harmondsworth, UK: Penguin Books.

Cawte, J. (1974). *Medicine is the Law: Studies in Psychiatric Anthropology of Australian Tribal Societies.* Honolulu, Hawaii: University Press of Hawaii.

Chaiken, S., Stangor, C. (1987). Attitudes and attitude change. *Annu. Rev. Psychol, 38*, 575-630.
[http://dx.doi.org/10.1146/annurev.ps.38.020187.003043]

Chalmers, D.J. (1996). *The Conscious Mind. In Search of a Fundamental Theory.* New York: Oxford University Press.

Churchland, P.M. (1981). Eliminative materialism and the propositional attitudes. *J. Philos, 78*, 67-90.

Churchland, P.S. (2011). *Braintrust: What Neuroscience Tells us about Morality.* Princeton, NJ: Princeton University Press.
[http://dx.doi.org/10.1515/9781400838080]

Cloninger, C.R., Svrakic, D.M., Przybeck, T.R. (1993). A psychobiological model of temperament and character. *Arch. Gen. Psychiatry, 50*(12), 975-990.
[http://dx.doi.org/10.1001/archpsyc.1993.01820240059008] [PMID: 8250684]

Cromwell, O. (1986). Letter to the General Assembly of the Church of Scotland. *The Oxford Dictionary of Quotations* (3rd ed.). U.K: Oxford University Press. (Originally published 1650)

SUBJECT INDEX

NAME INDEX

Jonathan Leicester

Jon Leicester graduated in medicine from the University of Sydney and trained in neurology at the Royal Prince Alfred Hospital in Sydney and Massachusetts General Hospital in Boston, where he worked with the behavioural psychologist Murray Sidman. He then worked in neurology attached to RPAH and was consultant in several psychiatric hospitals in Sydney. He retired from clinical work in 1999, when aged sixty, to pursue this project on his long-standing interest in belief.