Neurology and Kindness

Medicine, Religion, Morals

By

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The Kindness of DNA. Nucleotide Sequence of the human Brain-1 genomic DNA and its deduced amino acid sequence. Research Gate, Japan. Eighth century Crucifix, Clonmacnoise. Museum of Ireland, Dublin.

Chapters

Foreword

This book is about the fundamental unknown of Biology. 2,375 human brain genes had been identified and sequenced before the end of the last century[1]. How can a DNA code make a thought, lead to the growth of a Good Person? I have no answer other than to look at people's lives from the Cruel Roman Soldier Longinus who offered his Vinegar-soaked sponge to Christ to the Kind Neurologist, Constantin von Economo who researched the world epidemic of Encephalitis Lethargica, 'Sleeping Sickness' in 1917 - 1927.

The journey goes from the Tree on Cos where Hippocrates taught medicine and asked for the help of the Gods to a Lakeside Cottage Hospital in Galilee, by way of Smithfield Meat Market in London and a Robot Laboratory in Japan to end at a Red Cross Conference in Greece. There are old sheep and a donkey but also a new Minibrain, first grown on a laboratory bench in Vienna.

The book is written for everyone who looks after the sick - nurse, doctor, hospital porter, ambulance driver as well as WHO worker at a time when medical technology and committee meeting if not a God-protected USA Senate can seem to replace personal care. Neurology advances fast with its Economo Neurones, Synapses, Maps and Mirrors: recognition and relationship systems that make a living awareness mindful of the world and its own place in it. But any study of the roots of kindness needs more than brain and cranial nerves: the moral principles of ethics and the faith of a Buddha who two and a half thousand years ago taught the way to live. Many if not all of the old Greek, Roman, Aztec Deities are now dead, the kindness of Faith hidden under nation, language, race. Christianity has had its Auto-da-fé and is given only lukewarm support in much of Europe today. At the end of the twentieth century Hindus destroyed the Masjid-i-Janmasthan in India: a New Armageddon is now threatened in Palestine. The need is for real kindness to silence the guns as well as to oneself, to heal human sickness, care for a damaged world.

The Kindness of the Good Shepherd. Vatican 200 lire postage stamp. A second-third century sarcophagus unearthed in a vineyard on Rome's Via Salaria with a PalaeoChristian sculpture. The road ran 240 km across Italy to the Adriatic Sea.

Acknowledgements

I was lucky with my spiritual director that year. Kind, a wonderful school teacher to her children in the Philippines: on a Sabbatical Year in Wales. She asked me what I thought about Kindness and Cruelty in a Damaged World and then to Write it Down. The next year, things were different when a new director, trained in the best Jesuit Tradition, told me to stop thinking, shut up, get down on my knees and Pray.

The Questions to answer are not simple:

1. How DNA with all its on-off switches makes a brain is the easy bit but how a chemical can lead to thought, appreciate poetry and then be kind or cruel is more difficult.
2. What is Kindness - is sadness, affliction inseparable, wired in from the start?
3. Are humans all born neutral: but then grow kind and generous or cruel and nasty according to how they are treated, what is taught or learned; the result of freedom of will or the prison of fate?

I asked for help: first from a child, second from a Zoologist, third from a Theologian who did not believe in any Man Upstairs but was moved by art as well as poetry.

Lol, starting her career as electrical engineer, answered for the first as she fed me on delicious French chocolate-coated Madelines and told me about Twinkl. The zoologist, friend of more than half a century from Taunton School and then Cambridge - world expert in Butterfly genetics came next. The Theologian, an applicant for the Priesthood, frightened me sailing on a cold North Sea and sent me to Saint Beunos to find silence despite admitting that he would be scared to go there himself. An orthopedic surgeon colleague then asked what on earth I was doing 'in some or other Monastery in Wales?'

Medical Students, Psychologists from the Institute of Psychiatry; Californian Buddhist Christopher Christ Bearer with his son Togoldor,

Mongolian for Perfect: a Member of the Opus Dei University of Pamplona, and a Senior Registrar whose parents lived at Number 1, Rue Dolorosa in Jerusalem all helped. They followed different religions but all knew the best way to Grow Good People. Three Librarians, Joyce at the Maudsley Institute of Psychiatry, Helen at Kings and Holly at the Wellcome were invaluable and provided much of the basics, many of the pictures. Sarah has been a wonderful editor as well as publisher. Catching her holiday plane from Luton, not early morning tramp steamer from Piraeus she knew that the correct spelling was Cos, not Kos. Mention must also be made of the Irish Dublin Museum scholar who told me the names, not mentioned in the Bible, of the two Roman soldiers above. A London Stamp Auctioneer sold me the Greek stamps that answered the final question for well under £ 10 (including VAT).

Introduction: The Titles of this Book

A Neurologist.

Neurology is defined in the Shorter Oxford English dictionary as 'the scientific study or knowledge of the anatomy, functions and diseases of the nerves and nervous system.' My standard British-American textbook of clinical neurology fills two volumes with 88 chapters and 2128 pages. The language is technical, issues defined, wiring diagrams included, conclusions open to experimental proof. The pictures are more of pathology than of people. A 117-page index goes from abdomen, referred pain via lipofuscinosis and Vernet's signe de Rideau to Zoster sine herpete.[2]

Kindness is described as a disposition of affection and friendship: the gentle compassion of acts of virtue in an ideal society, part of both physical and mental health. St Paul places kindness together with long suffering at the head of his attributes of a religion of Love. In this book kindness is concerned with generosity, hope, healing and the daily caritas of giving and receiving care, together with the development of stem-cell banks more than with any distant Supernatural Creator. It has many practical faces that involve politics, economics, social engineering, philosophy as well as a spirit that goes out to others. The opposites, *selfishness*, *cruelty*, *evil* are very real.

Medicine needs no definition. It is a universal need, a Creation of God supported if not always supplied by the World Health Organisation, WHO. *Religion,* defined as a bond of Love between man and God is illustrated in The *Catechism or Belief System* of the Catholic Church by a third century AD catacomb image of the Blessed Virgin and a modern wood carving of Mary with Jesus in her womb by George Mung Mung, 'the fruit of the meeting of Catholic and Aboriginal cultures in Australia'. A recent Catechism was developed after the 21st Vatican ecumenical council and contains 2856 articles that go from 'We Believe' to the final 'Amen' over 691 pages. The

42-page index goes from Abortion via Immaculate Conception, Sin (original), the Trinity, Virtue and Will to end with YWEH.

Morality is based on basic principles of right and wrong: beneficence, nonmaleficence, autonomy and justice. These govern a person's behaviour and conduct from helping a neighbour to question of abortion and euthanasia from birth to death. At least in theory, ethics should be independent of religion. All these subjects are central to the Hippocratic oath, to a place where a mechanical brain can meet, greet and touch the world outside. Medicine and religion have been connected from well before 400 BC when Hippocrates taught under his plane tree on the Greek Island of Cos. His oath asked physicians to do the best in their job that they could: in the original Greek, aided by their Gods.

The Gospel of Saint Mark starts with a healing Deity in a house by Lake Galilee where a patient is lowered on a bed by ropes from the roof for treatment by Christ and two fishermen with miracle and prayer. These remained the basis for medical care from Rahere's foundation of St Bartholomew's Hospital in 1123 until reason, science and logic replaced belief. When Richard Bentley Todd developed medical and nursing education at King's College Hospital in South London in 1841 nurses were taught Christian values and doctors expected to practice them. At the time the brain was still a jelly and Darwin was not to dethrone a Creator Eternal Superior Being for another 18 years. But the nineteenth century growth of science largely displaced religion, miracle and God; and now a mini-brain has been grown on a laboratory bench in Cambridge as well as Vienna, whilst the demands of digital computers, artificial intelligence, management and economics have lessened the call of religion, the kindness

of caring buried under the face of a Godless human fear of illness, pain, loneliness and death. The original Greek oath of Hippocrates is threatened if not lost.

The rise of psychiatry has strengthened the ethics of care for the mind as well as explained several human ills once attributed to the Gods: epilepsy is no longer a sacred disease. However fragments of the gods remain and the catechism of the Catholic Church lists palliative care as one form of selfless love whilst the people of Gheel in Belgium, once visited by an eighth century Irish Saint fleeing from a lustful father, show exemplary community care and foster the families of people with dementia. A National Sunday of prayer for children and adults with autism and their families was held in Saint Paul's Cathedral in London in February 2002 whilst in Islam the care of an autistic child is seen as a religious duty. Charity was shown in a Golden Age when the devout Muslim physician Avicenna gave a ducat on discharge to each patient and hired musicians to soothe their melancholy whilst the ascetic Abdul Sattar Edhi who died in 2016 founded the largest ambulance service in the world in Pakistan. A central principle of Judaism is shown in acts of loving kindness.

David Marsden was the most brilliant British neurologist of the late twentieth century. He worked on the wards by day; at night on the National Physics Laboratory computer. He often told me that we were grains of sand, lost on a vast sea shore. Kings College Hospital in London became a good place to work for a Ph. D and at the same time deconstruct God after work in the Phoenix and Firkin in the Denmark Hill Railway Station. Traditionally, the Phoenix arose from burnt ashes: and the Camberwell Society rescued the Booking Hall after an arson attack. This closed as a home-brew pub in 1999. A Firkin, a liquid measure, was usually about the size of a quarter barrel. Many were drunk.

A different non-alcoholic alternative could have been found in the Kings College Hospital Chapel Prayer Request Book: '*Dear God, Thank you for the gift of a kidney. I would like to offer a prayer for the soul of my donor.*'

'Dear God, Please help me through this. Make my little girl well again. Please can she wake up. Don't take her, please don't take her.'

'God help me. I haven't the strength to continue. Please look after Sam'.

Winchester College Chapel Misericord Cripple.

For many people religion remains an essential kindness as well as gift shown in relationship, mystery, sacrifice and love despite past intolerance, inquisition, war. Need in its widest sense remains unchanged, shown in a sixteenth century misericord in Winchester College Chapel that depicts a cripple with a low spinal lesion and long-standing leg and foot deformity. A moneybag for alms is tucked in his belt. I have seen similar wooden knee and wrist supports in Belarus and India, and sights like this must have been common when Christ told a lame man to pick up his bed and walk.

In the twenty-first century the reasoned religion of the medieval theologian Aquinas who developed philosophical proofs for the existence of a God who sought to transmute suffering into holiness has been replaced by Feng Shui and New Age views. The original vision of the Hebrew Scriptures, the freshness of the New Testament world and the call of the Koran can sit uneasily with a new despair where God is absent, lawyers in Agra call to convert the Taj Mahal into a Hindu temple in the name of Shiva, personal piety is considered a matter of gene mutation or variation and consciousness is downgraded to a by-product of some more important neural process.

The Contents

Neurology and Kindness is centred on an old Alehouse motto, 'Keep within Compass 'and aims for common sense rather than elevated belief or computer scans of meditating Buddhist nuns. Chapters focus on a person or an illness - in the case of Dolly, a sheep - and on a structure or process of the nervous system.

A wide area is covered from head and neck refrigerators in Silicon Valley to time clocks and environmental seasonal flight plans of Equatorial swallows. Appetite, the guts, hunger and thirst, food and drink are all

relevant to both kindness and religion - Martin Luther was constipated for many months after the Diet of Worms. The disbeliefs of medical students, the religious practices, if any, of neurologists, the dislikes and loves of children with autism and the hopes of a Pope with Parkinson's disease are all considered. Mad saints, hospital social workers and mountain climbers have their say along with the mystic Teresa of Avila who had to be held down by her nuns when levitating during prayer. Any Deity is allowed if not expected to have a sense of humour.

Throughout, the aim has been to set neurology, people and disease into a world where a new James Parkinson can inject lentiviral vector-based genes into the striatum, but also say his or her prayers like the old apothecary who had been a church warden at St. Leonard's and could hear the bells ring out the peal of the nursery rhyme Oranges and Lemons in Shoreditch, his parish then just outside London. The church vestry was responsible for poor relief, and in 1813 Parkinson was appointed as surgeon and man-midwife to the workhouse.

James Parkinson delivers an alehouse sermon on moderation and the evils of drink. The alehouse sign is the once popular proverb, 'Keep within Compass. The Villager's Friend and Physician. Or, a familiar address on the preservation of health, and the removal of disease on its first appearance: supposed to be delivered by a village apothecary. With cursory observations on the treatment of children, on sobriety, industry, &c. James Parkinson, published C. Whittingham for H. D. Symonds, London, 1804

An ideal society should be free of War, without Nuclear Weapons, at Peace with Neighbours. But can this ever be possible without any cost - in Politics, Civilisation, Economics as well as in personal payment; some level of want, long suffering, pain embedded in the kindness of love, the making of an individual person in a group society?

Chapter 1
Auguste Forel: Foundation Neurology

Foundation of Neuroscience
Forel and Rise of Neuroscience
Forel and the Baha i Faith
Advance of Neurology
Retreat of Religion
Ignatius Loyola and Spiritual Exercises
William James and Varieties of Religious Experience

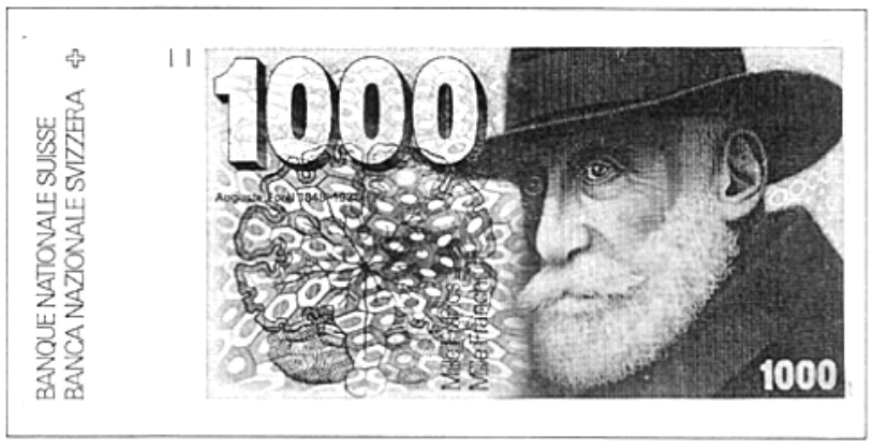

Figure 1.1: *The Brain, a Synapse, and Auguste Forel. A thousand-franc note engraved with the face of Auguste Forel, to the right of a depiction of the human brain and a Golgi preparation of a neurone. Courtesy Swiss National Bank, SNB*

In the 11th-15th century age of faith life expectancy in Western Europe was around 30 years. The ordeals of illness and death were ever present, and in the West Christ's role as a heavenly physician seemed essential. Now the healer has changed from God to man, medicine from the salvation of the soul and the cure of scrofula (perhaps skin tuberculosis) by prayer, from the sacraments and the divine touch of kings - all of uncertain efficacy - to the management of autism by one-to-one education, cure of the mind by

cognitive therapy, avoidance of syphilitic paralysis of the insane by early antibiotic treatment. These certainly work. The ability to influence birth, life and death has advanced dramatically, and life expectancy for men and women in Western Europe, North America and Japan is now near 80 years although the end years may be negated by dementia. Killer diseases like meningitis and poliomyelitis have been largely controlled by vaccination and handicaps and suffering that were once accepted as inevitable parts of the human condition are less readily acknowledged. At the end of life, death has lost much of its previous familiarity, pushed behind curtains or confined to old peoples' homes, and the hope of heaven replaced by the expectation of medicine to prolong life, refrigeration of the corpse to provide eternity.

Neurology and neuroscience started in the nineteenth century. The Napoleonic wars were over, Britain about to have dominion over a world empire, a young Queen Victoria on the throne. Oxford and Cambridge clergymen climbed high mountains in the Alps and a young Darwin set sail to the Galapagos islands.

On the Origin of Species by Natural Selection, or the Preservation of Favoured Races in the Struggle for Life was published on 24 November 1859. The English scientific establishment was closely linked to the Anglican church of the time, and the book deeply questioned its core theology. Clergymen shuddered, the then bishop of Oxford generally known as Soapy Sam likened Darwin to an ape, whilst Darwin, once destined by his father to become a clergyman and following the death of his ten-year old daughter Anne, later lost his faith. However some religious conservatives survived, and a Victorian neurologist in England, Robert Bentley Todd, who like the Prime Minister Gladstone favoured the Broad or Middle Church of England, thought that morality and religion should have equal weight with medicine in the teaching of nurses and students, and actively supported the London University foundation of King's College and its Hospital in 1840 - 1841. Todd was a clinical pioneer and investigated the nature of epilepsy, considering this not the sacred disease of the ancient Greeks but a spreading electrical discharge in the brain. Perhaps it was fortunate for his religious views that he only survived for a few weeks after the publication of Darwin's book.

Forel and the Rise of Neuroscience

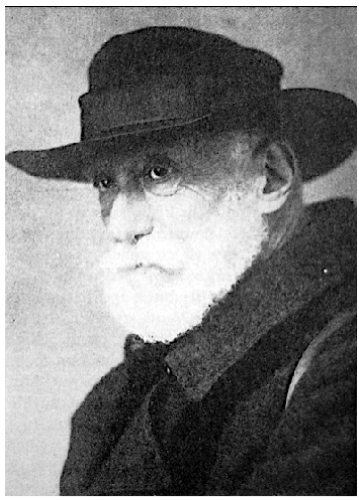

Figure 1.2: *Auguste Forel. Source: Banknote; Haymaker and Schiller, The Founders of Neurology. Courtesy Dr. Hartwig Kuhlenbeck, Philadelphia.*

Schwann introduced his cellular theory of biological structure in 1839. Proof of this for the brain had to wait until the middle of the nineteenth century when better lenses, dies and fixatives allowed squashed tissue to be seen clearly for the first time. The first useable brain microtome was developed by Gudden and used by his pupil, Auguste Forel in Switzerland when he looked down his microscope and saw discrete cells. The brain was not, as previously thought, a jelly but made up of individual neurones.

Forel (1848-1931), psychiatrist, neuroanatomist and social reformer was like Darwin intrigued by insects and became a world authority on ants - as a boy Jeanne Pierre Huber's *Natural History of Ants* was literally his Bible. He named his home *La Fourmilliere,* the Ant Colony; and as a medical student, wrote a monograph on the ants of Switzerland, publishing his magnum opus on the subject in five volumes, *The Social World of Ants*, at the age of 75. This was strongly influenced by Darwin, interested in many different branches of natural history, although his attempt to parallel the insect social world with human psychology did not escape controversy.

Forel grew up a committed scientist; but also dedicated to social reform, struggling for social justice, supporting the idea of a 'United Nations of Europe', campaigning for better hospital conditions, advocating

international justice as well as concerned with the condition of the sick and the poor[3]. He was an early advocate of the role of women in society, universities and politics. Although his mother came from a long line of Calvinists, Forel for most of his life had little time for religion; and castigated what he saw as the hypocrisy, taboos and bigotry of the Swiss religious establishment of his time. This came to a head when he supported the liberalization of abortion, the tolerance of homosexuality, and wrote a far-ranging book, 'The Sexual Question.' His liberal views and this book were attacked by church and state as well as later by the Nazi party.

Professor of Psychiatry in Switzerland for over 30 years, many of his patients were alcoholics, and Forel campaigned against alcohol abuse, opened non-alcoholic restaurants, going as far as to cajole his colleagues and nurses to preach the evils of drink and himself to abandon all alcohol. At the Burgholzli hospital in Zurich he was interested in the therapeutic use of hypnotism, problems of philosophy and the brain-mind relationship. His childhood interest in social insects blossomed into the study of social man, and he was firmly convinced that brain and mind were one - that every act of the mind had a molecular mechanism in the brain; whilst his hypnotic powers were so strong amongst women that he was said to be able to influence the timing of the menstrual cycle. The pioneer of schizophrenia, Emil Kraepelin, called Forel a 'social genius', whilst Forel criticised Freud for his sexualist theory of neuroses.

Forel went on to achieve fame with his 1887 paper in the Berlin Archives of Psychiatry that firmly established the neurone theory, the brain made up of a series of interconnected cells, their processes and their connections[4,5]. The microscopic findings of Forel were later elegantly confirmed by the artistically inclined Spaniard Santiago Ramon y Cajal, who as an enthusiastic young doctor had published one of his first papers on neurones in *The Catholic Daily* and then sent reprints to the crowned heads of Europe.

Forel suffered a severe stroke in 1912 at the age of 64 that left him aphasic and hemiplegic, but lived a further 19 years, learning to write with his left hand. His distinguished student, friend and colleague, the neuro-pathologist Oskar Vogt, who had a Lutheran minister, sea captains and a

pirate amongst his forbears, dissected his brain. Vogt deserves mention here as an early founder of a brain bank, containing among others 30 brains collected by the French neurologist Pierre Marie; and for his work with his wife Marie on the cytoarchitecture of the human and simian cortex. More than anyone before or since, and looking for the origins of human genius and uniqueness, the pair studied the brains of famous people. As well as that of Forel, these included that of Lenin: even before his death, Vogt travelled to Moscow to act as Lenin's neurologist. The scientific credibility of some of the Vogt's brain autopsies were queried by other neuropathologists who had not themselves worked for so many hours at the microscope and who murmured when Lenin was said to have an extra cortical layer, not shared by others, without notice of the neurosyphilis that contributed to his death.

Forel and the Baha'i faith

At the end of his life Forel abandoned his earlier socialist and racial views, and in 1920 became a member of the Baha'i faith, founded by Baha'ullah in the nineteenth century in Persia. It is a monotheistic religion that teaches the unity of God, the source of all creation: the unity of religion, that all religions have the same spiritual source: and the unity of humanity, that all humans are created equal. The human purpose is to get to know and love God and serve all humanity, with constant evolution to establish peace, justice and global unity. Fanaticism, alcohol, political partisanship, homosexual acts and pre-marital intercourse are forbidden, ritual limited to an obligatory 15 minute daily prayer with a yearly nineteen day sunrise to sunset fast. Meditation and reading Bahi faith literature and prayers are encouraged. Spirituality is grounded in everyday life, work done in a spirit of service to humanity, meetings for worship taking place largely in individual's homes.

The word *Baha* comes from the Arabic for splendour or glory. Although Baha'ism can be seen as an amalgamation of monotheistic faiths, sharing many beliefs and practices with Judaism, Christianity and Islam, its proponents consider it as a true unifying separate religion; an instrument of peace and fulfilment, a guide to both body and spirit. In the Baha'i religion, God is often referred to by titles or attributes, the All-Powerful,

the All-Loving. Although in essence inaccessible and unknowable by the human mind, Deity can decode human attributes, is conscious of Creation, and has his own purpose and will, with religion evolving from age to age. Human beings have a 'rational soul', the avenue to recognise God and relate to the Creator. Through charity, obedience, prayer and service to humanity, the soul at death passes into the next world of spiritual closeness to God rather than a hell or heaven of punishment or reward.[6]

In 1921, Forel received a letter from the founder's son 'Abdu'l-Baha about the differences between the mineral, vegetable, animal and human worlds, the spiritual nature of man and proofs of the existence of God. Forel wrote: *'This is the true religion of human social good, without dogmas or priests, uniting all men on this small terrestrial globe of ours. I have become a Baha'i. May this religion live and prosper for the good of mankind; this is my most ardent wish.'*[7] Baha'ism has a famous quote about kindness: '*Strive ye then with all your heart to treat compassionately all humankind--except for those who have some selfish, private motive, or some disease of the soul*'.

Today Baha'ism has perhaps five to seven million adherents worldwide despite bitter persecution from those considering it apostasy from Islam: a dangerous political grouping, not any form of religion. With the rise of an Islamic Republic and Guard in twenty first century Iran, a determined effort has been made to wipe out any trace of Baha'i faith with torture, morning execution without trial of any known adherent.

Since the time of Forel neurology and neuroscience have made a gigantic advance to achieve the present age of stem-cells and monoclonal antibodies, minicomputers at synaptic sites that control multiple neurotransmitter release at nerve junctions, and connections in the brain where electricity, not a chemical, can be the messenger. Neuropsychiatry has come close to neurology with the finding of genetic linkages, protein abnormalities and environmental factors in many conditions from alcoholism and depression to schizophrenia. Geneticists now argue that much psychiatric illness, once thought to involve only the 'mind', results in the first place from disease of the brain, and that an ideal classification for mental illness should start from a genetic predisposition and environmental trigger rather than with a symptom complex.

Brain processing is now seen as computation. The ways by which thoughts, actions and sensory-motor integration are achieved through control loops, switches and somewhat misleadingly named 'mirror 'neurones that respond in the same way to a motor action as to viewing this are being uncovered. The prestigious Laskar Foundation award for 2013, second only to the Nobel prize in science was made to Richard Scheller and Thomas Südhof for their work on the identification of a myriad of membrane proteins responsive to calcium release at brain synapses, a development almost as important as the discovery of DNA. However, the final frontier, that of the creation and nature of mind, remains a near-total mystery.

In contrast to the advance of neurology, classic religion has retreated. The battle between faith and logical thought has been lost many times over the last two hundred years, not least when the French revolution introduced the Goddess Reason into Notre-Dame. At the start of the third millennium in much of Christian Western Europe incarnation, angels, virgins, shepherds and kings are at best only a Christmas myth, and resurrection a dream. Bible and Church are both suspect, whilst chemical encounters in a boiling sea, chance mutation, natural selection and epigenetics have replaced Genesis myth and Godly design. For much of Western science, the language of faith is redundant and that of religion has no place in neurology, ethical decision-making or healthcare. In the West today, outside what remains of the Protestant and Catholic Church, God, the 'Holy One', and 'sanctity' are not much mentioned. Any miracle. resurrection of the body or ancient Christian debate over the literal nature of the Son of God is often downgraded to a natural event or seen as an embarrassment rather than a truth; many ancient spiritual beliefs becoming unbelievable with the demotion of God from heaven to earth whilst the soul, once thought of as immortal and giving meaning to life has largely disappeared since Voltaire gave his maid a lesson in practical philosophy behind a gooseberry bush: kindness corrupted by selfishness, power and replaced by malevolence.

Despite this withdrawal, the strong fortress of God has not been entirely destroyed. Auguste Forel stressed the importance in religion of personality and feeling, the sixteenth century Spanish Catholic soldier, Ignatius of Loyola the value of ancient belief, memory and the senses, and the early

twentieth century American philosopher and psychologist William James of usefulness and reason. Religion in its emphasis on prayer, thankfulness, revelation and redemption is still revered by many looking to an all-powerful Being, the source of Kindness and Love, who however distant and inaccessible is still concerned with his or her world, and is in relationship with humankind. It teaches a personal as well as universal value system extending over the whole conduct of life and death.

Although religion is often thought of in terms of black or white, false or true, the reality for most people comes in shades of grey, different levels of uncertainty, strangeness and surprise. In the 1920s Reinhold Niebuhr, an American pastor to car workers in Detroit looked for a God who worked for social justice through everyday politics. The German pastor Dietrich Bonhoeffer who took part in the bomb plot against Hitler supported agricultural communities for people with epilepsy and before execution wrote in his letters from prison of 'religionless 'Christianity. Something of the Battlefield of religion of Saint Ignatius remains, whilst William James ' take on the psychology of religion continues to reveal many deep depths of the human spirit. A note on both men, totally different in character, illustrates the wide spectrum of religious thought encompassed by the human brain and mind.

Ignatius Loyola and The Spiritual Exercises

Why join Kindness with Neurology in the Title? Christ, the disciples, the people of the Promised Land spoke Aramaic, where the kindness of love is named "Khuba" - the most important word in the teachings of Jesus with over 50 mentions in the Gospels.

Auguste Forel thought of Neurology in terms of the Brain, but also of the Mind when in 1907 he wrote his book *Hygiene of Nerves and Mind in Health and Disease.* His social care and humanity were outstanding and he showed great kindness throughout his life.

My list of Kind Neurologists starts with Forel, followed by the Austrian Constantin von Economo, early describer of the Sleeping Sickness epidemic that swept the word for ten years after 1917. He was also a lieutenant in the Austrian Airforce in 1915 - 1916, taking part in the First World War battles

above his home near the Isonzo river valley dividing Austria-Hungary from Italy. These resulted in 1.7 million people seriously wounded or killed. Austria had been on the side, not of Britain and her allies, but fought alongside Germany.

In the early sixteenth century the wounded Spanish warrior Ignatius of Loyola developed military-like exercises directed to the finding of Khuba - translated into the Latin of Caritas, English of Charity (Chapter 9). These are still surprisingly popular and a good place to practice them and retreat from endless out patient clinics, collection of material in a biscuit tin from the post-mortem room and write the next paper, is Saint Beunos in Wales. Here is the warfare, smoke and gun of Ignatius but also, an old shire horse that gallops to the roadside to greet you in the farmer's field below asking for new grass from your side of the fence while a shepherd up the lane tells you the names of his sheep. The exercises themselves ask for great courage and generosity, but you can sit in a garden on an old Victorian iron bench, look out over the valley to the hills of Snowdonia, read the poetry of Gerald Manley Hopkins who wrote of finding 'a Winter and Warm'. Despite the cost the kindness of love adds meaning to any study of neurology, brain and mind.

William James and 'The Varieties of Religious Experience'

Adam Lord Gifford established in 1888 a series of lectures given in Scottish Universities that came under his name for '*the Study of Natural Theology in the widest sense of the term – in other words, the knowledge of God.*' The 1901 lectures were given in Edinburgh by William James (1842 – 1910), American psychologist and philosopher. The son of a theologian who looked for the true nature of God, and brother of the novelist Henry James, William trained in medicine but never practiced. He became professor of first psychology and then philosophy in Harvard, a man of wide learning and culture. Founded upon the lectures he published in 1902 what is still perhaps the most attractive and most-read book about the connection between neurology and religion, '*The Varieties of Religious Experience.* ' James took a scholarly approach to the knowledge of God when he looked at the results of religion rather than the foundation of belief. The lectures were based not on any Deity, church dogma or mystery, but on human

experience including the odder ranges of desert pillar standing and self-mortification. James was far more analytic than Forel in his approach to religion, far more questioning than Ignatius would ever have allowed.

James thought of religion under headings of high mindedness, solemnity, seriousness, mystery and luminosity but left everyman to his own definition of the divine. High seriousness was at the head of his list. Laughter was not included, although Jonathan Sacks, the chief Rabbi of the United Hebrew Congregations of the Commonwealth, wrote in 1998,' *An ability to laugh is a victory of faith over fate-humour remains God's gift of humanity in a sometimes inhuman world.*'[8]

James himself had a deep respect for religion although one of the main questions he considered in '*The Varieties of Religious Experience*', was as to whether this made any difference in the conduct of life: on balance, his view was positive. As to his own beliefs, James considered true as those that proved useful to the believer and helped to provide better and fuller lives. Unlike his pastor father, he found theology difficult, divided religion into the personal and the institutional, avoided all mention of 'church 'and in his index entries for religion included the subheadings, '*to be tested by fruits, not by origin*': '*abstractness of its objects*': '*differs according to temperament*': '*more than science, it holds by concrete reality*': '*its relation with melancholy is for life, not for knowledge'.* 'Whilst writing with deep humanity, he showed how it was easy for religion to become too nice. His book still influences religious studies today, despite the replacement of an old soul with a new interpersonal relationship. James emphasised the importance of individual religion and a personal God over and above any generic idea of Divinity.

William James 'criteria of religious experience included luminosity, akin to the sense of wonder as well as to that of mystery and related to the occasional sense of something beyond. Luminosity can come in many ways. For some this is unheralded, for some it lies in worship, for others it is gained from climbing mountains or listening to music. For John Bunyan, confined in Bedford Goal, it lay in his vision of the journey of his Pilgrim. A similar vision can be present in the sea, or in a distant landscape; the sense of an unreachable, untouchable, beyond, a mystery behind the curtain universal to the human spirit. It may be the same as what a few have described in near-

death experience, or for the poet Coleridge in the opium enchantment of Kublha Khan and the secret caverns of the mind. Others find this in art: in music, in poetry, in a walk in the wood or by the sea.

James thought that for religion and prayer to be genuine, some sort of real effect must take place, the prayerful influence spread to the world of facts. He concluded that one fundamental religious point was that in prayer, 'spiritual energy, which otherwise would slumber, does become active, and that spiritual work of some kind is effected really.' Although James did not spell it out, I suspect that for him in some way grace was available and that the old Hippocratic idea of medicine as a 'sacred' calling was still relevant. Religion may indeed originate in the human brain but this is here more than an intelligent personal computer. It is linked to a world of loveliness and blessing, something unachievable by artificial intelligence, apart from any world-wide-web.

Figure 1.3: *Out Patient Hall, Hospital for the Paralysed and Epileptic, Queen Square, London, around 1899. By courtesy NHQS Archives.*

The work of the hospital, dedicated to social good, was financed entirely by charity although a contribution was requested from those who could afford it. A notice in the waiting room stressed that treatment would in no way depend upon the ability to pay.

Chapter 2
David Marsden: Neurology and Religion at King's College Hospital

This chapter is about neurology and religious views in Kings College Hospital from its foundation in 1841 when the brain was still a jelly and Darwin not to dethrone a Creator Supernatural Being until 1859, to the years when the brain became seen as some kind of advanced computer sensory-motor machine and god a by-product of its Neuronal Networks.

One of the first King's College Hospital founders, *Richard Bentley Todd* (1809 - 1860) was an investigator of epilepsy. *David Ferrier (*1843 – 1928), one of the first neurologists to study the localisation of cortical function in the brain with the description of the primary motor cortex in the posterior

frontal lobes, spent equal time in laboratory and clinic. *David Marsden* (1938 - 1998) gained great distinction through his work on motor systems and the faculty of the brain to plan, but unlike both Todd and Ferrier, did not experiment on animals. Recently *Edward (Ted) Reynolds* has led the way worldwide in the study of Epilepsy and the treatment of its victims.

Neurology and Religion at Kings

Figure 2.1: *Richard Bentley Todd. The statue, which resembles a Roman Senator, now weatherbeaten and crumbling, stands outside the Denmark Hill entrance Ambulance bays. Courtesy King's College Hospital Foundation Trust.*

Several of the British founders of neurology, neuropsychology, neuropsychiatry and psychiatry were deeply religious and thought of religion as a way of life that included the way that they practised medicine. Others had no belief in any God, any faith lying in observation, experiment and scholarship.

Robert Bentley Todd (1809-1860) was a younger brother of the Rev. James Henthorn Todd, D.D., Regius Professor of Hebrew at Dublin University. Throughout his life, the Irishman Todd had a solid religious faith, a member of the Church of England. As with many of the London founders of King's College he favoured the middle ground, neither evangelical nor a follower of high church ritual, vestment and incense. He was largely instrumental in the founding of the initial King's College Hospital that was opened in an old poorhouse at St. Clement Dane's in 1841 and moved to a new site in 1851 where Todd became the first Dean, and helped to found St. John's House institution for nurses. Named after St. John the Evangelist,

this was a community of lay and religious sisters trained in both religion and nursing.

There is no doubt that the driving force in Todd's full and busy life was the desire to relieve human suffering. He considered that moral and religious education was as important as apprenticeship in medicine and in nursing, and that practical work in education and healthcare should be founded on Christian principles. He proposed a residential college system at King's, with the aim, '*To form habits moral and professional which will fit the possessor to occupy a station of respectability and usefulness, in his particular calling as well as in society at large*'.[9]

Todd, a clinician as well as Professor of Physiology, was one of the first to consider a possible neurone doctrine where the brain was not a single organ but made up of countless components. However at the time there was no proof of this. He thought deeply about epilepsy and claimed that nervous system tissue stored an electrical force very much like that of William Faraday's Galvanism. In experiments on rabbits, he observed facial twitching when the cortex was stimulated by electricity, but did not attribute the movement directly to the cortex but to deeper structures. He described peripheral neuritis and was the first man to describe the then common complication of syphilis, tabes dorsalis, and link this to damage to the posterior columns of the spinal cord. Along with James Graves he was the most eminent clinical teacher of the nineteenth century in England, instructing that cases of acute disease should not be subjected to depressing treatment but that the vital powers of the body should be upheld by brandy.[10] [11] [12]

David Ferrier

David Ferrier (1843–1928) was a physician at King's College Hospital and Professor of Neuropathology at Kings College. As a student, he worked under the free-thinking philosopher and psychiatrist, Alexander Bain and his focus throughout life was on the brain rather than the soul when he showed that cortical motor organisation was the same in a dog as a man; his watchword was '*to experiment, experiment.*' Until the nineteenth century the cortex was thought of as an insignificant 'rind' to the brain, which is

what the word means. Ferrier moved to London in 1874, joined the clinical staff at King's and working in the same period as Paul Broca and his studies of language, was one of the first neuroscientists to establish cortical localization of movement control in apes. The Hippocratic doctors of the 5th century B.C. were well aware of head injuries and knew that they produced contralateral symptoms. However not until the work of Ferrier and his colleagues was the supreme importance of the cortex recognised, individual functions ascribed to separate cortical areas, and the anatomical basis of the crossing of motor and sensory pathways recognised: made necessary by or as an accompaniment to the visual cross-over of the external world on the retina produced by the lens of the eye. This crossing goes back at least to cephalopod molluscs such as the squid.

Ferrier first studied rats, rabbits, cats and dogs and showed that the cortex could be stimulated by an electrical alternating current, which if applied for five or more seconds resulted in semi-purposeful directed movement of face, mouth or limb whilst alternatively ablation of the whole motor area straightway led to paralysis.[13] He went on to develop ideas of the exact cortical localization of motor function, and then a topographical map of the motor cortex. The organisation of motor areas was similar in a dog to a man. Ferrier's results emphasised the cortical control of a movement rather than of a single twitch. Later development of more and more elegant ways of cortical stimulation, including single fibre muscle recording with focus on very discrete brain areas, attributed cortical control to muscles rather than movement and emphasised the importance of multiple control loops from cortex through deep areas of the brain as well as of motor and sensory neurones reaching out to and from the environment.

Ferrier spent almost as much time in the clinic as in the laboratory, where his experiments supported Todd and Hughling Jackson's views of epilepsy as a spreading electrical discharge, and led directly to the rise and success of neuro-surgery when for the first time it became possible to correlate clinical symptoms with an exact area of the brain. The clinical examination of a patient with epilepsy allowed the surgeon Victor Horsley (1857 – 1916) successfully to predict the site of a tumour pressing on the cortex, and then to remove it whilst blood clots and other pathologies were eliminated with striking success. In 1881 at an international medical conference initially

opened by Prince Albert, the Cardinal Archbishop of Westminster, the Archbishop of York and the Lord Bishop of London, Ferrier displayed an ape with partial paralysis after a motor cortex lesion. To show the exact distribution and extent of the lesion, the ape was immediately sacrificed. Charcot, in the audience, was amazed and in French exclaimed, '*It's a patient*.'

Ferrier's experiments raised the question as to whether animal cruelty was allowable in the ultimate search for general good; and put science well ahead of any religious principle. He spent his life in the search for experimental proof rather than in ancient belief. One of the last of physicians to conduct ward rounds in a traditional top hat and black tailcoat, he was also one of the founders of the journal, Brain; and in 1876 published his experimental results in *The Functions of the Brain* – a highly influential book now considered one of the classics of neuroscience.[14]

Taken to court by anti-vivisectionists and charged under the Cruelty to Animals act of 1881, he stoutly defended his position and won the case on the basis that it was his colleague, Yeo, who had actually performed the animal surgery. Honoured by a knighthood in 1912, a fellow of the Royal society at the age of 33, laureate of the Institut of France and with many other distinctions throughout his long active life, he died in 1928. Small in stature, a student, friend and later colleague of Hughlings Jackson, direct in thought and quiet in manner, a neurology ward at both the National Hospital Queen Square and at King's College Hospital was named in Ferrier's honour.[15,16]

David Marsden: The Motor System at the end of the Twentieth Century

The neurologist David Marsden was the first appointee at the age of 34 to the newly established joint chair of Neurology in the Institute of Psychiatry and King's College Hospital that straddle Denmark Hill three miles south of the centre of London. The Maudsley Hospital, Denmark Hill railway station with the Phoenix and Firkin pub attached, a park in which William Blake saw an angel and a Salvation Army Training College are immediate neighbours.