

The History of Psychology
Part Three: The 1800's

Dr. C. George Boeree
Psychology Department
Shippensburg University

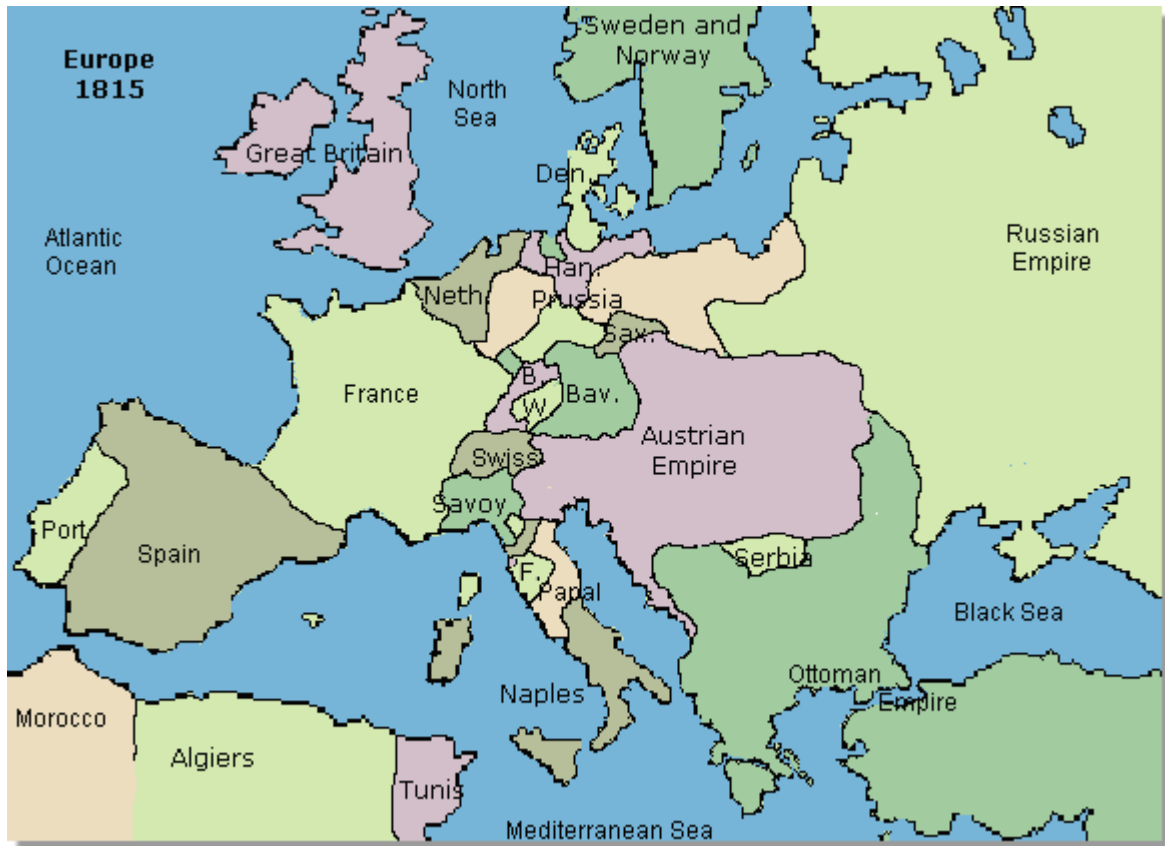
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Map: Europe 1815



Timeline: The 1800s

1801 **Pinel** writes text on Moral Therapy

1804 **Immanuel Kant** dies

1807 **Hegel** completes *The Phenomenology of Spirit*

1808 **Reil** coins term "psychiatry"

1810 **Gall** publishes the first volume of *Anatomie et Physiologie du Système Nerveux*

1811 **Sir Charles Bell** reports to associates at a dinner party the anatomical separation of sensory and motor function of spinal cord

1815 Napoleon surrenders at Waterloo

1816 **Johann Friedrich Herbart** publishes *Lehrbuch zur Psychologie*

Herbart's text introduces the concept of repression

1819 **Schopenhauer** writes *The World as Will and Idea*

1822 **Francis Magendie** publishes an article which postulates the separation of sensory and motor function of the spinal cord

1831 **Goethe** completes *Faust* – he dies the following year

1834 **Johannes Müller** publishes *Handbüch des Physiologie des Menschen*

1835 **Colt** invents the revolver

1842 **Auguste Comte** completes his six-volume *Course in Positive Philosophy*

1843 **Kierkegaard** publishes *Either/Or* and *Fear and Trembling*

1845 **Morton** uses ether as an anesthetic

1845 The Irish famine – over one million die and another million leave Ireland

1847 **Marx and Engels** publish *The Communist Manifesto*

1848 **Haucock** performs first appendix operation

1855 **Herbert Spencer** publishes the two volumes of the *Principles of Psychology*

Alexander Bain publishes *The Senses and the Intellect*

1856 **Hermann Ludwig Ferdinand von Helmholtz** publishes the first volume of the *Handbuch der physiologischen Optik*

1859 **Charles Darwin** publishes *The Origin of the Species*

Alexander Bain publishes *The Emotions and the Will*

1860 **Gustav Fechner** publishes *The Elements of Psychophysics*

1861 **Paul Broca** shows that the loss of speech in one individual is due to a lesion in third convolution of the left frontal lobe

1861 Italy is united under **Victor Emmanuel II** for the first time since the Roman Empire

1861 The abolition of serfdom in Russia frees 40 million serfs

1862-1865 The American Civil War frees 4 million slaves – over 600,000 soldiers die

1863 **Wilhelm Wundt** publishes *Lectures on Human and Animal Psychology*

I. M. Sechenov publishes a monograph *Reflexes of the Brain*, in which he attempted to analyze the higher order functions in terms of the reflex schema

1864 **Louis Pasteur** invents "pasteurization"

1865 **Mendel** discovers the laws of genetics

1867 **Lister** invents antiseptic surgery

1869 **Francis Galton** publishes *Hereditary Genius* and uses the normal distribution for purposes of classification

Von Hartmann writes *Philosophy of the Unconscious*

1870 **G. Fritsch** and **E. Hitzig** realize the first direct electric stimulation of the brain

1871 **Charles Darwin** publishes *The Descent of Man*

1871 Germany finally united under Prussian leadership: "The Second Reich"

1873 **Wundt** publishes *Principles of Physiological Psychology*

1874 **Franz Brentano** publishes *Psychology from an Empirical Standpoint*

1876 **Alexander Bain** establishes *Mind*, the first journal devoted to psychological research

1879 **Wundt** establishes the first psychological laboratory at the University of Leipzig in Germany

Lightner Witmer uses the term clinical psychology for the first time

1882 **Charcot** opens clinic at Salpetriere

Christine Ladd Franklin completes the doctoral program in mathematics at Johns Hopkins – no degree granted due to prohibition against granting doctorates to women!

1883 **Francis Galton** publishes *Inquiries into Human Faculty and Its Development*

Wundt establishes the journal *Philosophische Studien* to publish the results of his laboratory research

Kraepelin publishes list of disorders

Nietzsche publishes *Thus Spake Zarathustra*

1884 **William James** publishes *What is an Emotion?*

1885 **Hermann Ebbinghaus** writes *On Memory*

1885-6 **Freud** studies hypnotism under **Charcot**

1886 Louis Pasteur cures rabies

1889 **William James** publishes *The Principles of Psychology*

1890 **Ehrenfels** writes *About the Qualities of the Gestalt*

1892 The **American Psychological Association** is founded with 42 members

Edward Titchener introduces his version of Wundt's structuralism to America.

1893 **Oswald Külpe** publishes *Outline of Psychology*

1894 **John Dewey** publishes *The Ego as Cause*

Margaret Floy Washburn becomes the first woman to receive a PhD in psychology; Her dissertation was supervised by Titchener

1895 **Josef Breuer** and **Sigmund Freud** publish *Studies in Hysteria*

Gustave Le Bon publishes *Psychologie des Foules*

1896 **Dewey** publishes in the *Psychological Review* his famous article *The Reflex Arc Concept in Psychology*

Lightner Witmer establishes at the University of Pennsylvania a clinic of psychology, the first psychological clinic in America and perhaps in the world

1897 **Wundt** publishes *Outlines of Psychology*

1898 **Titchener** publishes *The Postulates of a Structural Psychology*

E. L. Thorndike publishes *Animal Intelligence*

Early Medicine and Physiology

The ancients

Although always a part of philosophy, psychology has close ties as well to biology, especially human physiology and medicine. As long as the mind is in some way attached to a body, this is inevitable. But, as you know, it took quite a bit of prying the mind apart from its religious connection with an immortal soul before that intimate connection would be acknowledged!

"The First Physician," at least as far as the Greeks were concerned, was **Asclepius**. He started a partially mystical society or guild of physicians that was to have an influence for many centuries to come. During that time, he gained god-like status. Even Socrates, as he lay dying of the overdose of hemlock, told his student Crito to sacrifice a cock to Asclepius, presumably in thanks for an easy death.

More clearly historical is **Acmaeon of Croton** (b. 435 bc) in southern Italy. A pythagorean by philosophy, he was known for his anatomical studies. He is the first person we have record of who dissected the eye and discovered the optic nerve. His theory of the mind included the idea that the brain is the seat of perception and thought, and that there are connections from all the sense organs to the brain. He believed that it was pneuma, meaning breath or animal spirits, ran through the body like neural signals.

Disease, he theorized, is at least in part due to a loss of balance in the body. He postulated a set of opposites, especially hot and cold, wet and dry, and bitter and sweet, that we need to balance in order to maintain health, by controlling our temperature, nutrition, and so on.

Hippocrates (b. 460 bc) of Cos in Asia Minor, is better known. He was an Asclepiad – i.e. a member of the medical guild, and is the originator of the Hippocratic Oath. But note: Contrary to popular belief, few if any doctors are required to take this or any other oath!). Despite his background, he preferred to avoid mystical interpretations and stick close to the empirical evidence. For example, in a treatise called "On the sacred disease" (meaning epilepsy), he dismissed the usual demonic-possession theory and suggested that it was an hereditary disease of the brain.

He is also known for his theory of humors. According to Greek tradition, there are four basic substances: earth, water, air, and fire. Each of these has a corresponding "humor" or biological liquid in the body: black bile, phlegm, blood, and yellow bile, in that order.

These humors, just like the four basic substances, vary along two dimensions: hot or cold, and wet or dry, like this...



	wet	dry
hot	air/blood	fire/yellow bile
cold	water/phlegm	earth/black bile

Like Alcmaeon said, the task of the physician is to restore balance when the relative proportions of these humors were out of balance. Hippocrates also noted some emotional connections to these humors.

It should be noted, despite the odd humor theory, that Hippocrates and with him Plato correctly recognized the significance of the brain. A bit later, around 280 bc, Erasistratus of Chios dissected the brain and differentiated the various parts.

For the most part, of course, medicine in these centuries, and for many centuries to come, consisted of a

blend of first aid – the setting of bones, for example – and herbal remedies, plus a considerable amount of praying to the gods for miraculous intervention!

In the Roman Empire, another physician gained fame that would last well into the Middle Ages: **Galen** was born 130 ad in Pergamon in Asia Minor – a major center of learning at the time. He went to Alexandria – THE center of learning – to study anatomy. In the Roman Empire, dissection of humans was not allowed – based, of course, on superstitious fear of retribution, not on any feelings of human dignity! So Galen studied the great apes instead.

At the age of 28, he returned home for a while to serve as surgeon to the gladiators. His fame spread, and he went to Rome.

In addition to a great deal of fairly decent, concrete advice, he theorized that all life is based on pneuma or spirit. Plants had natural spirit, which causes growth. Animals have vital spirit, which is responsible for movement. And human beings have animal spirit – from the word anima, meaning soul – which is responsible for thought.

He believed that cerebrospinal fluid was the animal spirit, and noted that it was to be found in the cerebral vesicles of the brain as well as the spinal cord. He believed it traveled out through the nerves to the muscles, as well as in from the sensory organs. Not bad.

It was Galen who added the idea of temperaments to Hippocrates' four humors:

Blood	sanguine, cheerful
Phlegm	phlegmatic, sluggish
Yellow bile	choleric, angry
Black bile	melancholy, sad

Note how these words have come down to us. Note also how we use terms like "he is in a good humor," "he has a bad temper" (as in temperature), "he has a dry wit" (referring to the wet-dry dimension), and "he is a hot-head" (the cool-warm dimension). Imbalances among these psychological states, he believed, were one more cause for diseases. Of course, this is the first known personality typology! It had some influence on people as varied as Alfred Adler, Ivan Pavlov, and Hans Eysenck.

The rebirth of medicine

It is some time before we again see real progress in medicine and physiology. In 1316, **Mondino de Luzzi** came out with the first European textbook on anatomy, appropriately called *Anatomia*. Early in the 1500's, **Da Vinci**, naturally, plays a part with numerous drawings of skulls and brains, and even a wax casting of the ventricles. In 1561, **Gabriele Fallopio** published *Observationes Anatomicae*, wherein he describes, among many other things, the cranial nerves and, of course, the fallopian tubes

Real progress had to wait for the invention of the microscope by **Zacharias Jansen** of Middleburg, Holland, in 1595 (or by his father, Hans). It would be refined by **Antonie van Leeuwenhoek** in Holland, **Galileo** in Italy and **Robert Hooke** in England.

(Soon afterwards, in 1608, a colleague of Zacharias Jansen in Middleburg, a German by the name of Hans Lippersberg, invented the telescope.)

Another major event was **William Harvey**'s (1578-1657) explanation of the circulation of the blood in 1628.

Most physicians, still using Galen's text, believed that the blood ebbed and flowed like a tide through the whole body!

Centers of medical education developed in the universities at Padua, Italy and Leyden, Holland. Here, students studied anatomy, did post-mortems, and even dabbled in what we would now call pathology. They performed careful case-studies, with detailed measurements.

Neurophysiology developed in parallel to all the other medical and physiological developments. We could point to **Thomas Willis**'s anatomical description of the brain in 1664 as the first major step. His book was illustrated by Christopher Wren, the famous English artist and architect. Willis coined the term **neurology** in 1681.

A very significant contributor to the development of our understanding of the brain was none other than our old friend **Rene Descartes**. He postulated a dualistic system, with a mind/soul interacting with the brain/body by means of animal spirits (pneuma). The will (an aspect of our souls) enters the brain as animal spirits via the pineal gland, interacts with the organization of nerves that represent established habits, courses through the nerves (viewed as tiny tubes) to the muscles, causing them to contract and so produce a behavior!

Likewise, actions upon the sensory neurons cause increases in pressure on the animal spirits, which course through the nerves to the brain, influencing the structure of the brain by repetition, as well as passing on to the soul as perceptions.

Sometimes, the actions of the senses led to rather immediate responses by the muscles. These would be called reflexes by Descartes' countryman, **Jean Astruc**, and were defined as cycles of action that do not require the intervention of the mind or soul. Descartes did include far more complex behavior as reflexes than we would today.

Passions (roughly, emotions) also come from outside the body, essentially as sensations. They lead to a variety of physiological changes as well as reflex actions: We see a bear, we run! In animals, these passions are just sensations and reflexes. We, however, experience them with our mind/soul as wonder, love, hate, desire, joy, and sadness, as well as hundreds of combinations.

Descartes ideas, minus the soul, would be promoted by **Julien Offay de la Mettrie** (1709-1751) in a landmark book called *Man a Machine* (1748). **Robert Whytt** (1714-1766) would later lay down the neurological basics of the reflex, and introduce the terms stimulus and response. In 1791, **Luigi Galvani** clinched these concepts with his famous experiments involving the electrical stimulation of frogs' nerves.

About 1721, **Lady Mary Montegu** introduced a strange medical practice she had seen while visiting in Turkey: Inoculation. Instead of letting a full-blown case of smallpox damage their lovely skin, young women had pus from someone with a mild case of smallpox injected just under the skin. (Don't laugh: Today, people have themselves injected with the poison botox to erase wrinkles!) **Edward Jenner** later began inoculating people against the smallpox by vaccinating them with cowpox material. The antibodies produced made one immune to smallpox as well as further cases of cowpox.

The 1800's

Medicine got its greatest boost in the 1800's, especially after **Louis Pasteur** (1822-1895) came up with the theory that diseases were caused by micro-organisms. The new field of bacteriology continued with Pasteur's friend **Joseph Lister** (1827-1912), who introduced the novel idea of antiseptic conditions in surgery – especially washing one's hands!



Charles Bell (1774-1855) and **François Magendie** (1783-1855) independently clarified the distinction between sensory and motor nerves. They noted that sensory fibers enter the posterior roots of the spinal cord, and motor fibers leave the anterior roots. Bell is also the first person to describe the facial paralysis we now call Bell's palsy. And Magendie was the first to test the cerebellum's functions.

Franz Joseph Gall (1758-1828) of Vienna and, later, Paris, studied the shapes of skulls and concluded that the various bumps and depressions in each person's head related to certain psychological and personality characteristics. This would become very popular as phrenology, even though serious scientists such as Bell and Flourens thought it absurd. Please don't misunderstand: There is little, if any, truth to this map!

Marie-Jean-Pierre Flourens (1794-1867) concluded that the cerebrum was in fact responsible for thought and will, and that it operates holistically – not as Gall would have it! He noted that the other parts – cerebellum, medulla, etc. – had different functions, but that each also works holistically within itself. It is also Flourens who introduces ablation as a way of studying the connection between the brain and behavior.

However, things just never seem to be that simple. **Paul Broca** (1824-1880), a French surgeon, had a patient that lost the power of speech due to a lesion in what is now called Broca's Area. Another surgeon, **Carl Wernicke**, published a book on aphasia in 1874. He, of course, discovered the significance of Wernicke's area.

In 1870, two researchers, **Eduard Fritsch** and **Gustav Hitzig**, used direct electrical stimulation of the brain in a dog to discover, among other things, the motor and sensory cortices. Four years later, **Robert Bartholow** does the same with a human brain. Their work established that there is indeed some localization of function – it just doesn't have anything to do with bumps on the head.

Johannes Müller (1801-1858), working in Berlin, developed the doctrine of specific energy of nerves. Each nerve, when stimulated, leads to only one sensory experience, even if it is stimulated in another manner than usual. A simple example is the light flashes you see when you press against your eyeballs! This (I think unfortunately) led to increased belief in indirect realism – i.e. that we don't actually experience the world directly.

Hermann von Helmholtz

Hermann von Helmholtz is arguably the most famous German scientist of the 19th century. He was born in 1821 in Potsdam, Germany, to Caroline and August Helmholtz. His father, a teacher as well as an officer in the Prussian army, began schooling young Hermann at home because of health problems.

He did attend Gymnasium from the ages of nine to 17. He wanted to study physics, but entered medical school in Berlin in 1838. His parents could not afford to send him without the scholarship given to medical

students who promised to serve in the army after graduating.

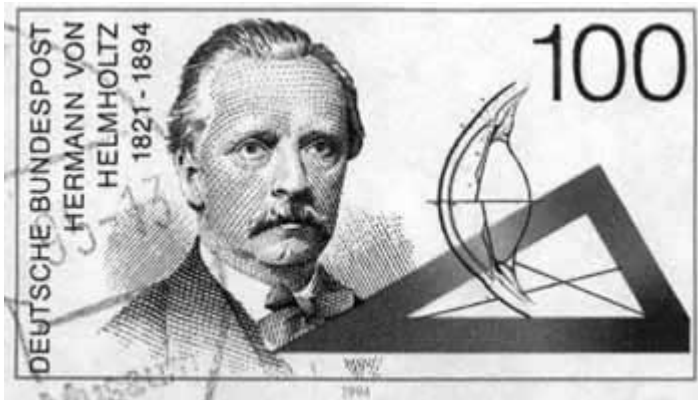
Helmholtz befriended several other young men – including **Emil Du Bois-Reymond** and **Ernst Brücke** – who were students of Johannes Müller at the nearby University of Berlin. These students, in contrast to their professor, swore a solemn oath to avoid vitalism, the belief that there was something unique about living, as opposed to non-living, matter: "No other forces than common physical chemical ones are active within the organism." Helmholtz adopted their position as well.

In 1842, he became an army surgeon at Potsdam, and continued studying math and physics on his own. In 1847, he read a paper at the Physical Society of Berlin on the conservation of energy. This alone would have won him an honored place in history!

Soon after, he became an associate professor of physiology at Königsberg, and married. During this period of his life, he measured the speed of the neural impulse. Prior, it was thought to be either infinite or the speed of light. He found it to be a paltry 90 feet per second. This put neurological activity well within the limits of ordinary physical and chemical sciences!

Along the way, in 1851, he invented the ophthalmoscope – the device doctors use to look into your eye.

In 1855, he moved to Bonn to be professor of anatomy and physiology. Here he began his research into sight and hearing. In 1856, he published the first of three volumes called the *Handbook of Physiological Optics*.



He moved once again in 1858, this time to Heidelberg as professor of physiology. During this period, his wife died, and he later married a young socialite. His philosophical work focused on epistemology, and he continued his research on sight and hearing. His explanation of color vision – that it is based on three cones sensitive to red, green, and violet – is still remembered as the Young-Helmholtz theory. He became quite famous.

In 1870, he was offered the chair in physics (his first love) at the University of Berlin. In addition to a huge salary, he was offered living quarters and a new Institute of Physics.

He published a number of papers on geometry, especially the non-Euclidean kind that would be so important to people like Einstein in the twentieth century. His main focus was physics, of course, and one of his prize students was Heinrich Hertz, who was the first person to actually generate radio waves in 1888.

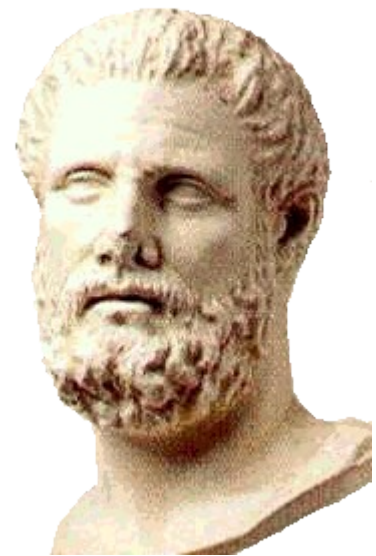
Helmholtz traveled to the US in 1893 as the German representative to the Chicago Worlds Fair. A bad fall on ship put his health in serious jeopardy. He died of a cerebral hemorrhage in September of 1894.

The Hippocratic Oath*

I swear by Apollo the physician, and Aesculapius, Hygeia and Panacea and all the gods and goddesses, that, according to my ability and judgement, I will keep this Oath and this covenant.

To reckon him who taught me this Art equally dear to me as my parents, to share my substance with him, and relieve his necessities if required; to look upon his offspring on the same footing as my own brothers, and to teach them this Art, if they shall wish to learn it, without fee or stipulation; and that by precept, lecture, and every other mode of instruction, I will impart a knowledge of the Art to my own sons, and those of my teachers, and to disciples who have signed the covenant and have taken an oath according to the law of medicine, but no one else.

I will follow that system of regimen which, according to my ability and judgment, I consider for the benefit of my patients, and abstain from whatever is deleterious and mischievous. I will give no deadly medicine to anyone if asked, nor suggest any such counsel; and in like manner I will not give to a woman an abortive remedy. With purity and with holiness I will pass my life and practise my Art.

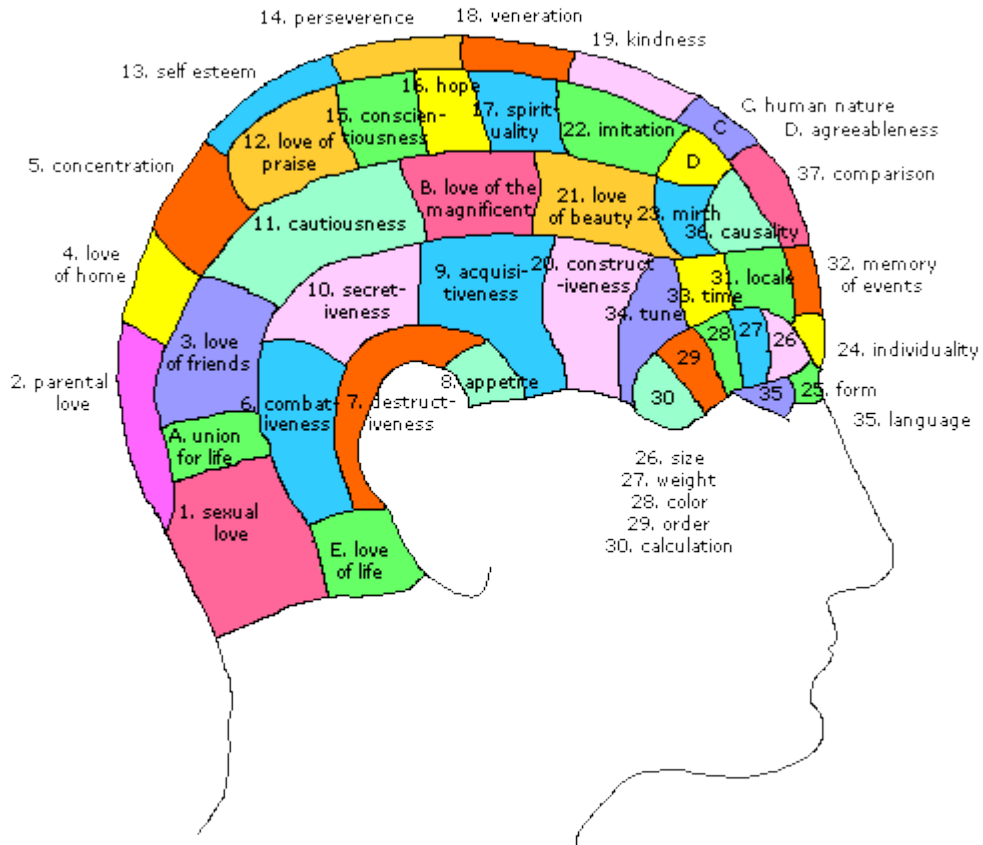


I will not cut persons labouring under the stone, but will leave this to be done by such men as are practitioners of this work. Into whatever houses I enter, I will go into them for the benefit of the sick, and will abstain from every voluntary act of mischief and corruption; and, further, from the seduction of females or males, of freemen and slaves.

Whatever, in connection with my professional practice, or not in connection with it, I see or hear, in the life of men, which ought not to be spoken of abroad, I will not divulge, as reckoning that all such should be kept secret. While I continue to keep this Oath unviolated, may it be granted to me to enjoy life and practice of the Art, respected by all men, in all times. But should I trespass and violate this Oath, may the reverse be my lot.

* Source: <http://www.usmedstudents.com/links/hippocraticoath.htm>

Phrenology Diagram



For much more on phrenology, go to http://www.bc.edu/bc_org/avp/cas/fnart/phrenology/

A Brief History of Psychopharmacology

The Ancient World

Drugs and medicines have always been with us. Where there were plants with psychoactive properties, there were people willing to use them, for pleasure or relief, or to kill.

Recorded history is filled with descriptions of potent psychopharmaceuticals, but some have been outstanding. **Alcohol** has been nearly universal in use, and was already presenting itself as a problem among ancient Greeks and Romans. There are records of **cannabis** use in the ancient Middle East. **Opium** was known to the ancients, but seems to have been restricted to medicinal use. **Hemlock** was certainly known – Socrates met his death with a cup of hemlock.

More exotic substances were also available. An extract of the **nightshade** or **belladonna** plant called **atropine** was used everywhere from Rome to India as a poison – and as a cosmetic device: women sometimes put a drop of weak solution in their eyes to dilate their pupils! It is still used for the same reason today by eye doctors.

Another favorite was the extract of the **foxglove** plant, called **digitalis**. A powerful poison, it was also used to treat various ailments.

And **mushrooms** provided many of our ancestors with interesting hallucinogenic experiences (and serious illnesses!). Some believe that the holy drink of the ancient Aryans mentioned in the Vedas – **soma** – was a concoction involving mushrooms.

The Middle Ages

Alcohol continued to be used with great gusto during the Middle Ages in Europe. Around 1250, Europeans developed the process of **distillation** and added **brandy** and other liquors to the already popular wine and beer. The generic term for these distilled products was "the water of life" – **aqua vitae**.

Early in the Middle Ages, Arab traders and warriors introduced the use of the opium poppy to India and China. In China, it was used primarily as a medicine. But in India, it became a widespread habit of the rich, and soldiers used it to bolster their fighting spirit. At this time, opium was ingested primarily as a drink; sometimes it was eaten.

The Age of Exploration

By the sixteenth century, alcohol had developed into a serious social problem. Worthies from Martin Luther to King James I of England condemned drunkenness. And yet society at large continued to see alcohol as a gift from God. Attempts to control its use invariably failed, and authorities were limited to regulating and taxing its sale.

Around 1650, a new leap was taken by the Dutch in the form of inexpensive distilled grain flavored with the berries of the juniper bush: genever or, in English, **gin**. It was an immediate success in England as well.

But new forms of psychoactive substances were pouring in from all over the world. **Coffee**, for example, was introduced into Europe from Arabia, where they had invented **coffee roasting** centuries before. Although Moslem religious figures condemned it, it was so popular among Moslems as a substitute for alcohol that it was dubbed "the wine of the Arabs."

Coffee was considered by Europeans and Arabs alike as healthful and therapeutic. It also wound up being the focal point of a new social institution, the coffee house or café. It was particularly praised as the long-sought substitute for the evils of alcohol.

In the latter part of this era, the East India Company and other trading companies began imported **tea** from China and India. It, too, was praised as a medicinal drink, but would not compete with coffee for some time to come.

One of the first things that Columbus and his emulators discovered, after they discovered America itself, was **tobacco**. The first seeds were brought to Europe by a French adventurer named André Thevet. It was deemed a potent medicine, good for a great number of ailments, especially those involving the lungs, by Jean Nicot of France – from whose name we get **nicotine**.

Tobacco seeds came to England ten years later, and spread throughout the upper classes through the salesmanship of a certain Sir Walter Raleigh. It was praised as a panacea, and became a major crop for settlers in Virginia and other New World locales. In an effort to control its use, it was heavily taxed.

Smoking also spread throughout Asia, from Turkey to China. The response was far more negative than in Europe: Selling tobacco was punishable by decapitation in China, for example, and carried the death penalty in the Ottoman Empire. In Russia, one could be tortured and exiled for using it. And the pope made excommunication the punishment for clergy who took up the habit.

None of this, of course, actually did any good.

Another major drug to enter the Western arena in this period is **coca**. **Coca leaves** had been chewed for ages in South America, especially among the Incas. After Pizarro destroyed the Inca Empire in 1553, a Spanish adventurer named Monardes brought the plant to Europe, but it failed to catch on – at this point!

The 1800s

In 1859, Dr. Pablo Mantegazzo isolated **cocaine** from the coca leaf, and wrote about its wonderful powers to combat fatigue, depression, and impotence. A few decades later, a Viennese physician by the name of Sigmund Freud sang its praises as an anesthetic and a restorative. With these and many other supporters, cocaine became quite popular. It even became a part of the formula for a popular tonic in the US known as **Coca-Cola**. Until 1903, "coke" contained 60 milligrams of cocaine per 8 ounce serving! After causing a number of deaths by overdose, it was outlawed in 1914.

A more serious issue in the 1800s was opium. In 1820, the Chinese, in an effort to stop the spread of opium addiction, prohibited the importation of opium. The British – who seem to play the part of the culprit in many of these situations – actually declared war on China in order to protect their precious opium trade. They ended up with their market intact and a piece of China called Hong Kong.

The use of opium was recommended by the medical profession in Europe and America, and few challenged them. The problem was exacerbated by a number of novelties: Friedrich Serturmer's discovery of **morphine**, an opium derivative, in 1803; the practice of smoking opium rather than drinking or eating it; and by the invention of the **hypodermic** in 1853.

Opium and its derivatives began to receive some well-deserved negative attention when the British author De Quincey wrote his best selling *Confessions of an English Opium Eater* in 1822. By this time, opium was available in the form of hundreds of different non-prescription medicines, and was quite popular among both upper and working classes.

In 1874, **heroin** was synthesized from opium, and was touted as a less dangerous form than opium or morphine. The name, in fact, refers to its supposed potential as the *hero* of medicines. In 1896, the Bayer company began marketing heroin.

Several other drugs became available to the European and American public in the 1800s. For one, laborers from India brought cannabis to Jamaica in the form of **ganja**. The Indian Hemp Drugs Commission put its stamp of approval on cannabis, saying its use is accompanied by practically no negative consequences, and the drug spread among the Jamaican lower class. It was available in the US and Europe, but it would not become popular until the next century.

Amphetamines, the first major synthetic drug, was discovered in 1887. Its use as a stimulant quickly became widespread. It was used in World War II to help energize soldiers and industrial workers alike.

Earlier in the 1700s, **ether** was discovered. When its effectiveness as an anesthetic became known in the 1840s, inhaling it or mixing a few drops in water became popular among upper class youth in the US and Europe. It would later spread to the poor of Ireland and other countries as a cheap alternative to alcohol.

And last, but not least, Claude Bernard began in 1856 to experiment with a poison from the Amazon jungles of South America called **curare**.

Psychedelic drugs

Psychedelic drugs or hallucinogens have been with us since ancient times, as mentioned above. But it wasn't until the 1900's – especially the 1960's – that they became as popular as they have. Here is a partial list:

Scopolamine, an anticholinergic drug, is found in **Atropa belladonna** (belladonna or deadly nightshade), **Datura stramonium** (jimsonweed), and **Mandragora officinarum** (mandrake).

A large number of modern drugs have catecholamine-like effects. The oldest is **peyote** (from the **Lophophora williamsii** plant), used by Mexican Indians. **Mescaline** is derived from peyote. There are two drugs, myristin and elemicin, which are found in **nutmeg** and **mace**. And there are the methamphetamines with their endless initials (DOM, MDA, DMA TMA, MDE, and MDMA – the last best known as **ecstasy**).

Arguably the most famous hallucinogens are the serotonin-like drugs. Some have ancient roots: **Psilocybin** and **psilocin** are derived from the mushroom **Psilocybe mexicana**; **Ololiuqui** was used by Central and South American Indians, and is better known as morning glory seeds; **Harmine** comes from the Middle Eastern plant called **Peganum harmala**; And **bufotenine** comes from the skin secretions of the South American bufo toad!

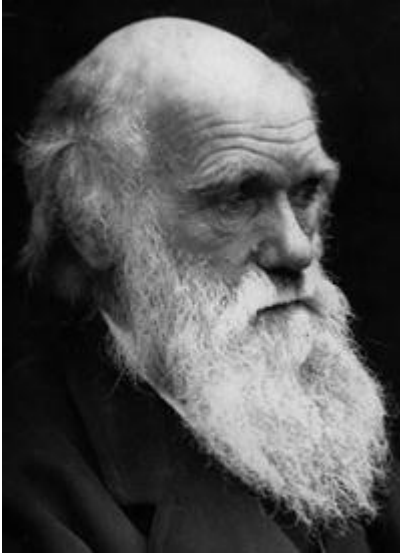
In 1938, however, all these begin to pale in comparison with the discovery by one Albert Hofman, a Swiss chemist, of a derivative of ergot (a rye fungus), which he called **lysergic acid diethylamide – LSD**.

And finally, we have the very dangerous psychedelic anesthetic drugs such as **phencyclidine**, discovered in 1956, and better known as **PCP** or **angeldust**.

Charles Darwin and Evolution

Charles Robert Darwin (1809-1882)*

Charles Darwin was born in Shrewsbury, England, on February 2, 1809. His father was Robert Waring Darwin, a physician and son of the famous Erasmus Darwin, also a physician, as well as a respected writer and naturalist. His mother was Susannah Wedgewood Darwin. She died when Charles was eight.



Charles was educated in the local school, taught by Dr. Samuel Butler. In 1825, he went to Edinburgh to start studying medicine, but he soon realized that he did not have the stomach for it! So he switched to Cambridge, ostensibly to become a clergyman. He was actually more interested in entomology – especially beetles – and in hunting. He graduated from Christ's College in 1831.

It is said that even when he was a young man, he had a patient and open mind, spending many hours collecting specimens of one sort or another and pondering over new ideas. The idea of evolution was very much in the air in those times: It was increasingly clear to naturalists that species change and have been changing for many millennia. The question was, how did this happen?

One of his mentors, John Henslow, encouraged him to apply for the (unpaid!) position of naturalist on a surveying expedition on the now-famous vessel, the *Beagle*, under the command of Capt. Robert Fitz-Roy. Charles left England for the first time in his life on December 27,

1831. He wouldn't return until October 2, 1836!

Most of the ship's time was spent surveying the coasts of South America and nearby islands, but it would also visit various Pacific islands, New Zealand, and Australia. It was the Galapagos Islands that most impressed him. There he found that finches had evolved a variety of beaks – each suited to a particular food source. Natural variation had somehow been selected to fit the ecological niches available on the tiny islands.

Upon returning, Darwin wrote several books based on his surveys on geology and the plant and animal species he had observed and collected. He also published his journal as **Journal of a Naturalist**. He notes that he was most impressed by the ways similar animals adapted to different ecologies.

From early on, Darwin recognized that selection was the principle men used so successfully when breeding animals. What he needed now was an idea as to how nature could perform that task without the benefit of intelligence!

In 1838, he read a book by Malthus called **Population**. Malthus introduced the idea that competition over limited resources would, in nature, keep populations stable. He also warned that human populations, when straining resources, would suffer as well!

On January 29, 1839, Darwin married Emma Wedgewood, a cousin. They lived in London for a few years, then settled in the village of Down, 15 miles outside London, where they lived the rest of their lives. Darwin began suffering from an illness he had probably contracted from an insect bite in the Andes many years before. Darwin's son, Francis, later could not say enough about his mother's dedication to his father's well-being. Without her, he would have been considerably less productive. They would go on to have two daughters and five sons.

Darwin wrote a sketch of his theory in 1842. In 1844, he wrote in a letter "At last gleams of light have come, and I am almost convinced (quite contrary to the opinion I started with) that species are not (it is like confessing a murder) immutable."

* A major resource for Darwin's biography was the 11th edition (1910/1911) of the Encyclopedia Britannica, available online at <http://www.gennet.org/darwin.htm>

He was about half done with a full exposition of his ideas when he received an essay from A. R. Wallace, with a request for comments. The essay outlined a theory of natural selection! Wallace, too, had read Malthus, and in 1858, while sick from fever, had the whole idea come to him in one flash. Darwin, in his reluctance, had postponed revealing his ideas to the scientific public for 20 years!

Darwin forwarded the essay to his friend, Sir Charles Lyell of the Geological Society, as Wallace had requested. Lyell sent the essay on, with an essay by Darwin, for presentation at a scientific conference.

The point they jointly made was clear: Just like men can exaggerate one or another minor variation by selectively breeding dogs or cattle, so nature selects similar variations – by only permitting the most successful variations to survive and reproduce in the struggle over limited resources. Although the changes would be slight and slow, the millennia would permit the obvious diversity of nature! Darwin named this **natural selection**.

In 1859, Darwin finally published his master work, on the **Origin of Species by Means of Natural Selection**. The book was an instant success. There was also, of course, a great deal of debate – mostly concerning the contrast with traditional religious explanations of the natural world.

Natural selection was often confused with an earlier idea of the French naturalist Lamarck. He suggested that characteristics acquired during an animal's life were passed on to its offspring. The famous example is how the constant stretching of the neck over many generations explains the giraffe's unlikely physique. This theory – **Lamarckianism** – was natural selection's major competitor for decades to come!

In 1868, he published **The Variation of Animals and Plants under Domestication**. Then, in 1871, he came out with **The Descent of Man, and Selection in Relation to Sex**. This was really two books in one. The second part is about sexual selection. This is what accounts for, for example, the bright colors of many male birds: Both the males' coloring and the attraction to the coloring on the part of the females during courtship are selected for because these variations benefit the offspring.

The **Descent of Man** portion of the book is a brief introduction to the idea that we, too, are the results of natural selection. This part would lead to a lot of heated arguments!

In 1872, **The Expression of Emotion** was published. This time, Darwin talks about the evolution of the signals that animals use to communicate – and relates those signals to human emotional expression. This is the first step towards what we now call sociobiology (and evolutionary psychology).

In addition to these influential books, Darwin also enjoyed studying and writing about plants. In 1862, he wrote **Fertilization of Orchids**. In 1875, he came out with both **Climbing Plants** and **Insectivorous Plants**. In 1877, came **Different Forms of Flowers on Plants of the Same Species**. In 1880, he wrote, with his son Francis, **The Power of Movement in Plants**. And in 1881, he published the famous **Formation of Vegetable Mould through the Action of Worms!**

Charles Darwin died April 19, 1882. He was buried in Westminster Abbey. He was apparently a kind and gentle man, beloved by his family and friends alike. Outside of his voyage on the Beagle, he rarely left his home in Down. Reluctantly, he surrendered his religious beliefs and settled into an agnosticism that did not prevent him from participating with his parish in charitable works.

Alfred Russel Wallace

Alfred Wallace was born in 1823 in the village of Usk in Monmouthshire, England. His options were limited as his father died when Alfred was still a young man. So, taking advantage of a natural talent, he became a drawing teacher.

He went on an expedition to South America with his friend Henry Bates. He spent four years in the jungles of Brazil. On his way home, the ship caught fire and sank – with four years of notes and specimen collections. The crew and passengers were fortunately rescued by a passing vessel. These adventures were the basis of **Travels on the Amazon and Rio Negro**, published in 1853.

Soon afterwards, he left on a second voyage, this time to Malaysia. This one would last eight years! It was during this expedition that he, sick with fever, had the idea for natural selection, and in two days, wrote an essay on the topic and sent it off to Darwin. After his return from Malaysia, he published **The Malay Archipelago**, a detailed journal on the plants, animals, and people of the islands.

He died November 7, 1913. Although offered a place at Westminster Abbey, his family preferred that he be buried near his home. His grave is appropriately marked by a fossilized tree trunk.

Thomas Henry Huxley

Thomas Henry Huxley was born May 4, 1825, the son of George Huxley, a schoolmaster, and Rachel Huxley. He received two years of formal education at his dad's school, and was for the rest self-educated.

Although he was raised Anglican, he became interested in Unitarianism and its naturalistic thinking. This interest led him to begin studying biology with his brother in law. His studies led to a scholarship to Charing Cross Hospital in London, where he won awards in physiology and organic chemistry.

He served as assistant surgeon on the HMS Rattlesnake, which was surveying the waters around Australia and New Guinea. To pass the time, he began investigating the various forms of sea life.

Huxley met and fell in love with Nettie Heathorn in Sydney in 1847. He then continued his biological research in that part of the world. After returning to England, he was elected to the Royal Society in 1850, but could not find an academic position. Depressed and angry, he began taking on controversial stands – including denial of the Christian version of geology.

In 1854, he began teaching at the Government School of Mines. Finally established as a gentleman, he brought the patient Nettie to England and they married in 1855.

Huxley met Darwin in 1856, and they developed a long and close friendship. He took it upon himself to begin a campaign for Darwin's theory, which earned him the nickname "Darwin's bulldog." In particular, he fought against the church and for the concept of human evolution from apes. All the while he was a great promoter of science in general and scientific education in particular.

Huxley was responsible for a great deal of research, from his original work on sea creatures to later work on the evolution of vertebrates. He also came up with the idea of **agnosticism** – by which he meant the belief that ultimate reality would always be beyond human grasp. And he is responsible for the popular metaphysical point of view known as **epiphenomenalism**.

In 1882, his daughter went mad. She would die five years later under the care of Jean-Martin Charcot, the great French psychiatrist. He became very depressed and retired from his professorship. For a while, he promoted Social Darwinism (see below), but backed away years later to say, with Darwin, that humanity is best served by promoting ethics, rather than instincts.

He died of a heart attack during a speech, June 29, 1895.

Herbert Spencer

Herbert Spencer was born April 27, 1820, in Derby, England. His father was a schoolmaster, and both his parents were "dissenters" (i.e. religious non-conformists). Spencer was clearly gifted and was mostly self-educated.

An excellent writer, he wrote articles on social issues for various magazines of the day and even became editor of **The Economist** for several years. In 1855, he published **The Principles of Psychology**. This became part of a series of books, which he called **The Synthetic Philosophy**, and included biology and sociology as well as psychology.

Originally believing in the inheritance of acquired characteristics (Lamarckianism), he became a follower of Darwin's theory. It was, in fact, Spencer who coined the phrase "survival of the fittest" But he also transformed Darwin's theory into a social theory that encouraged extreme individualism and laissez-faire economic policies, called **Social Darwinism**.

Basically, survival of the fittest was to apply to people competing against people as well, and he implied that it was something of a social duty to accept the fact that some would be rich and some poor – and that the consequences of poverty should not be interfered with. Even whole societies – such as England – were engaged in a struggle for survival that did not allow for weakness of will or sentimentality.

Social Darwinism is not something Darwin would have approved of. It has in it the fallacy of false analogy: Human society is not a neat parallel to the non-human biological world. Unfortunately, Social Darwinism seems to be here to stay, and can be found within Fascist, Conservative, and Libertarian political agendas, and in personal philosophies such as that of Ayn Rand.

Spencer is, nevertheless, considered one of the great productive thinkers of his day. He died Dec. 8, 1903, in Brighton, Sussex.

A Selection from *The Descent of Man* by Charles Darwin*

The main conclusion here arrived at, and now held by many naturalists who are well competent to form a sound judgment, is that man is descended from some less highly organised form. The grounds upon which this conclusion rests will never be shaken, for the close similarity between man and the lower animals in embryonic development, as well as in innumerable points of structure and constitution, both of high and of the most trifling importance, - the rudiments which he retains, and the abnormal revisions to which he is occasionally liable, - are facts which cannot be disputed. They have long been known, but until recently they told us nothing with respect to the origin of man. Now when viewed by the light of our knowledge of the whole organic world their meaning is unmistakable. The great principle of evolution stands up clear and firm, when these groups of facts are considered in connection with others, such as the mutual affinities of the members of the same group, their geographical distribution in past and present times, and their geological succession. It is incredible that all these facts should speak falsely. He who is not content to look, like a savage, at the phenomena of nature as disconnected, cannot any longer believe that man is the work of a separate act of creation. He will be forced to admit that the close resemblance of the embryo of man to that, for instance, of a dog - the construction of his skull, limbs and whole frame on the same plan with that of other mammals, independently of the uses to which the parts may be put - the occasional re-appearance of various structures, for instance of several muscles, which man does not normally possess, but which are common to the *Quadrumania* - and a crowd of analogous facts - all point in the plainest manner to the conclusion that man is the co-descendant with other mammals of a common progenitor.

We have seen that man incessantly presents individual differences in all parts of his body and in his mental faculties. These differences or variations seem to be induced by the same general causes, and to obey the same laws as with the lower animals. In both cases similar laws of inheritance prevail. Man tends to increase at a greater rate than his means of subsistence; consequently he is occasionally subjected to a severe struggle for existence, and natural selection will have effected whatever lies within its scope. A succession of strongly-marked variations of a similar nature is by no means requisite; slight fluctuating differences in the individual suffice for the work of natural selection; not that we have any reason to suppose that in the same species, all parts of the organisation tend to vary to the same degree.

By considering the embryological structure of man, - the homologies which he presents with the lower animals, - the rudiments which he retains, - and the reversions to which he is liable, we can partly recall in imagination the former condition of our early progenitors; and can approximately place them in their proper place in the zoological series. We thus learn that man is descended from a hairy, tailed quadruped, probably arboreal in its habits, and an inhabitant of the Old World. This creature, if its whole structure had been examined by a naturalist, would have been classed amongst the *Quadrumania*, as surely as the still more ancient progenitor of the Old and New World monkeys. The *Quadrumania* and all the higher mammals are probably derived from an ancient marsupial animal, and this through a long line of diversified forms, from some amphibian-like creature, and this again from some fish-like animal. In the dim obscurity of the past we can see that the early progenitor of all the *Vertebrata* must have been an aquatic animal, provided with *branchiæ*, with the two sexes united in the same individual, and with the most important organs of the body (such as the brain and heart) imperfectly or not at all developed. This animal seems to have been more like the larvæ of the existing marine *Ascidians* than any other known form.

The high standard of our intellectual powers and moral disposition is the greatest difficulty which presents itself, after we have been driven to this conclusion on the origin of man. But every one who admits the

* From Charles Darwin, **The Descent of Man and Selection in Relation to Sex** (New York: Appleton and Co., 1883), pp. 7, 609, 612-614, 618-619.

This text is part of the Internet Modern History Sourcebook, available at <http://www.fordham.edu/halsall/mod/1871darwin.html>

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principle of evolution, must see that the mental powers of the higher animals, which are the same in kind with those of man, though so different in degree, are capable of advancement....

The moral nature of man has reached its present standard, partly through the advancement of his reasoning powers and consequently of a just public opinion, but especially from his sympathies having been rendered more tender and widely diffused through the effects of habit, example, instruction, and reflection. It is not improbable that after long practice virtuous tendencies may be inherited. With the more civilised races, the conviction of the existence of an all-seeing Deity has had a potent influence on the advance of morality. Ultimately man does not accept the praise or blame of his fellows as his sole guide though few escape this influence, but his habitual convictions, controlled by reason, afford him the safest rule. His conscience then becomes the supreme judge and monitor. Nevertheless the first foundation or origin of the moral sense lies in the social instincts, including sympathy; and these instincts no doubt were primarily gained, as in the case of the lower animals, through natural selection.

The belief in God has often been advanced as not only the greatest but the most complete of all the distinctions between man and the lower animals. It is however impossible, as we have seen, to maintain that this belief is innate or instinctive in man. On the other hand a belief in all-pervading spiritual agencies seems to be universal, and apparently follows from a considerable advance in man's reason, and from a still greater advance in his faculties of imagination, curiosity and wonder. I am aware that the assumed instinctive belief in God has been used by many persons as an argument for His existence. But this is a rash argument, as we should thus be compelled to believe in the existence of many cruel and malignant spirits, only a little more powerful than man; for the belief in them is far more general than in a beneficent Deity. The idea of a universal and beneficent Creator does not seem to arise in the mind of man, until he has been elevated by long-continued culture....

I am aware that the conclusions arrived at in this work will be denounced by some as highly irreligious; but he who denounces them is bound to shew why it is more irreligious to explain the origin of man as a distinct species by descent from some lower form, through the laws of variation and natural selection, than to explain the birth of the individual through the laws of ordinary reproduction. The birth both of the species and of the individual are equally parts of that grand sequence of events, which our minds refuse to accept as the result of blind chance. The understanding revolts at such a conclusion, whether or not we are able to believe that every slight variation of structure, - the union of each pair in marriage, - the dissemination of each seed, - and other such events, have all been ordained for some special purpose.

Sexual selection has been treated at great length in this work, for, as I have attempted to shew, it has played an important part in the history of the organic world. I am aware that much remains doubtful, but I have endeavoured to give a fair view of the whole case. In the lower divisions of the animal kingdom, sexual selection seems to have done nothing: such animals are often affixed for life to the same spot, or have the sexes combined in the same individual, or what is still more important, their perceptive and intellectual faculties are not sufficiently advanced to allow of the feelings of love and jealousy, or of the exertion of choice. When, however, we come to the Arthropoda and Vertebrata, even to the lowest classes in these two great Sub-Kingdoms, sexual selection has effected much....

Sexual selection depends on the success of certain individuals over others of the same sex, in relation to the propagation of the species; whilst natural selection depends on the success of both sexes, at all ages, in relation to the general conditions of life. The sexual struggle is of two kinds; in the one it is between the individuals of the same sex, generally the males, in order to drive away or kill their rivals, the females remaining passive; whilst in the other, the struggle is likewise between the individuals of the same sex, in order to excite or charm those of the opposite sex, generally the females, which no longer remain passive, but select the more agreeable partners....

The main conclusion arrived at in this work, namely that man is descended from some lowly organised form, will, I regret to think, be highly distasteful to many. But there can hardly be a doubt that we are descended from barbarians. The astonishment which I felt on first seeing a party of Fuegians on a wild and broken shore will never be forgotten by me, for the reflection at once rushed into my mind - such were our ancestors.

These men were absolutely naked and bedaubed with paint, their long hair was tangled, their mouths frothed with excitement, and their expression was wild, startled, and distrustful. They possessed hardly any arts, and like wild animals lived on what they could catch; they had no government, and were merciless to every one not of their own small tribe. He who has seen a savage in his native land will not feel much shame, if forced to acknowledge that the blood of some more humble creature flows in his veins. For my own part I would as soon be descended from that heroic little monkey, who braved his dreaded enemy in order to save the life of his keeper, or from that old baboon, who descending from the mountains, carried away in triumph his young comrade from a crowd of astonished dogs - as from a savage who delights to torture his enemies, offers up bloody sacrifices, practises infanticide without remorse, treats his wives like slaves, knows no decency, and is haunted by the grossest superstitions.

Man may be excused for feeling some pride at having risen, though not through his own exertions, to the very summit of the organic scale; and the fact of his having thus risen, instead of having been aboriginally placed there, may give him hope for a still higher destiny in the distant future. But we are not here concerned with hopes or fears, only with the truth as far as our reason permits us to discover it; and I have given the evidence to the best of my ability. We must, however, acknowledge, as it seems to me, that man with all his noble qualities, with sympathy which feels for the most debased, with benevolence which extends not only to other men but to the humblest living creature, with his god-like intellect which has penetrated into the movements and constitution of the solar system - with all these exalted powers - Man still bears in his bodily frame the indelible stamp of his lowly origin.

Primal Patterns of Behavior

John and Mary A typical American couple

John and Mary picked out a lot in suburbia (1) and had a nice two-story house built on it (2). They have since moved in and made it a real home, with their own furniture, decoration, landscaping, and so on (3). They keep their home neat and clean, and are especially proud of their fancy master bathroom, with jacuzzi (4). They put up a fence to keep their dog in and their neighbor's kids out, and have installed burglar and fire alarm systems (5). They even had a nice mailbox sign made-up that says, in gold lettering, "The Smiths" (6). They like their town and spend some leisure time taking scenic drives (7) and frequenting their favorite "watering holes" (8).

Both John and Mary work (9) – they are "yuppies" – and although they like their work, they would have to confess that their true goal is to make a "killing" in the market (10). They bring home (11) quite a bit of money every week, and they have considerable investments and a sizable "nest egg" (12). Their jobs are demanding, the business world being highly competitive and "dog-eat-dog" (13). When they finalize a profitable deal, they like to celebrate afterwards (14). But they've also had their share of failures, and have had to skulk off with their "tails between their legs" (15).

They have quite a few friends at work (16) and like to get together (17). Most of these friends are people of their own status, because it's hard to be comfortable with someone who is your boss or who works for you (18). But they are polite people, and are always pleased to see an acquaintance (19). An attractive, well-groomed couple (20), John and Mary dated for about a year (21). They soon became a "serious item" and finally got married (22). They are thinking about having children (23), but are concerned that they will need to move if they want to provide their children with the best possible environment (24).

The Komodo Dragon*

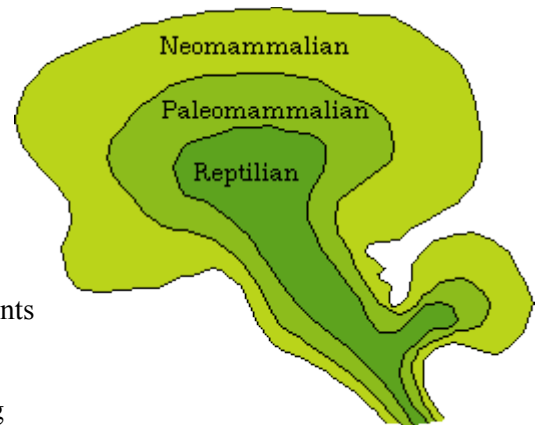
**An eight-foot lizard with a brain the size of a walnut:
Basic instincts**

1. Selection and preparation of homesite
2. Establishment of territory
3. Marking of territory
4. Use of defecation posts
5. Patrolling territory
6. Ritualistic display in defense of territory, commonly involving the use of coloration and adornments
7. Trail making
8. Showing place preferences
9. Foraging



* image from <http://www.lazoo.org/closeup.html>

10. Hunting
11. Homing
12. Hoarding
13. Formalized intraspecific fighting in defense of territory
14. Triumphal display in successful defense
15. Assumption of distinctive postures and coloration in signalling surrender
16. Formation of social groups
17. Flocking
18. Establishment of social hierarchy by ritualistic display and other means
19. Greeting
20. Grooming
21. Courtship, with displays using coloration and adornments
22. Mating
23. Breeding and, in isolated instances, attending offspring
24. Migration



Is there a komodo dragon inside YOU?

Sociobiology

Ever since Darwin came out with his theory of evolution, people - including Darwin himself – have been speculating on how our social behaviors (and feelings, attitudes, and so on) might also be affected by evolution. After all, if the way our bodies look and work as biological creatures can be better understood through evolution, why not the things we do with those bodies?

The entomologist E. O Wilson was the first to formalize the idea that social behavior could be explained evolutionarily, and he called his theory sociobiology. At first, it gained attention only in biological circles – even there it had strong critics. When sociologists and psychologists caught wind of it, the controversy really got started. At that time, sociology was predominantly structural-functionalist, with a smattering of Marxists and feminists. Psychology was still dominated by behaviorist learning theory, with humanism starting to make some headway. Not one of these theories has much room for the idea that we, as human beings, could be so strongly determined by evolutionary biology!

Over time, Wilson's sociobiology found more and more supporters among biologists, psychologists, and even anthropologists. Only sociology has remained relatively unaffected.

Instinct

Let's begin with an example of instinctual behavior in animals: The **three-spined stickleback** is a one-inch long fish that one can find in the rivers and lakes of Europe. Springtime is, as you might expect, the mating season for the mighty stickleback and the perfect time to see instincts in action.

Certain changes occur in their appearances: The male, normally dull, becomes red above the midline. He stakes out a territory for himself, from which he will chase any similarly colored male, and builds a nest by depositing weeds in a small hollow and running through them repeatedly to make a tunnel. This is all quite built-in. Males raised all alone will do the same. We find, in fact, that the male stickleback will, in the mating season, attempt to chase anything red from his territory (including the reflection of a red truck on the aquarium's glass).

But that's not the instinct of the moment. The female undergoes a transformation as well: She, normally dull like the male, becomes bloated by her many eggs and takes on a certain silvery glow that apparently no male stickleback can resist. When he sees a female, he will swim towards her in a zigzag pattern. She will respond by swimming towards him with her head held high. He responds by dashing towards his nest and indicating it's entrance. She enters the nest, her head sticking out one end, her tail the other. He prods at the base of her tail with rhythmic thrusts. She releases her eggs and leaves the nest. He enters and fertilizes the eggs, and then, a thorough chauvinist, chases her away and waits for a new partner.

What you see working here is a series of **sign stimuli** and **fixed actions**: His zigzag dance is a response to her appearance and becomes a stimulus for her to follow, and so on. Perhaps I'm being perverse, but doesn't the stickleback's instinctive courtship remind you of some of our human courtship rituals? I'm not trying to say we are quite as mindless about it as the stickleback seems to be – just that some similar patterns may form a part of or basis for our more complex, learned behaviors.

Ethologists – people who study animal behavior in natural settings – have been studying behaviors such as the sticklebacks' for over a century. One, Konrad Lorenz, has developed an hydraulic model of how an instinct works. We have a certain amount of energy available for any specific instinctual system, as illustrated by a reservoir of water. There is a presumably neurological mechanism that allows the release of some or all of that energy in the presence of the appropriate sign stimulus: a faucet. There are further

mechanisms – neurological, motor, hormonal – that translate the energy into specific fixed actions. Today, we might suggest that hydraulic energy is a poor metaphor and translate the whole system into an information processing one – each era has its favorite metaphors. But the description still seems sound.

Does any of this apply to human courtship and sexual behavior? I leave it up to you. But what about other examples? Two possibilities stand out:

1. There are certain patterns of behavior found in most, if not all, animals, involving the promotion of oneself, the search for status or raw power, epitomized in aggression. Let's call this **the assertive instinct**.
2. There are other patterns of behavior found in, it seems, somewhat fewer species, involving care for someone other than oneself, epitomized in a mother's care for her babies. Let's call this the **nurturant instinct**.

Evolution

The basics of evolution are quite simple. First, all animals tend to over-reproduce, some having literally thousands of offspring in a lifetime. Yet populations of animals tend to remain quite stable over the generations. Obviously, some of these offspring aren't making it!

Second, There is quite a bit of variation within any species. Much of the variety is genetically based and passed on from one generation to another. Included in that variety are traits that help some individuals to survive and reproduce, and other traits that hinder them.

Put the two ideas together, and you have **natural selection**: Nature encourages the propagation of the positive traits and discourages the negative ones. As long as variety continues to be created by sexual recombination and mutation, and the resources for life remain limited, evolution will continue.

One sociobiologist, David Barash, suggests a guiding question for understanding possible evolutionary roots of any behavior: "Why is sugar sweet", that is, why do we find it attractive? One hypothesis is that our ancestors ate fruit to meet their nutritional needs. Fruit is most nutritious when it is ripe. When fruit is ripe, it is loaded with sugars. Any ancestor who had a taste for sugar would be a little more likely to eat ripe fruit. His or her resulting good health would make him or her stronger and more attractive to potential mates. He or she might leave more offspring who, inheriting this taste for ripe fruit, would be more likely to survive to reproductive age, etc. A more general form of the guiding question is to ask of any motivated behavior "How might that behavior have aided ancestral survival and/or reproduction?"

A curious point to make about the example used is that today we have refined sugar – something which was not available to our ancestors, but which we discovered and passed on to our descendants through learned culture. It is clear that today a great attraction to sugar no longer serves our survival and reproduction. But culture moves much more quickly than evolution: It took millions of years to evolve our healthy taste for sugar; it took only thousands of years to undermine it.

Attraction

Let's start by looking at mate selection. It is obvious that we are attracted some people more than others. Sociobiologists have the same explanation for this as for everything else, based on the archetypal question "why is sugar sweet?" We should be sexually attracted to others whose characteristics would maximize our

genetic success, that is, would give us many healthy, long-lived, fertile children.

We should find healthiness attractive and, conversely, illness unattractive. We should find "perfect" features attractive, and deformities unattractive. We should find vitality, strength, vigor attractive. We should find "averageness" attractive – not too short, not too tall, not too fat, not too thin.... Quasimodo, for all his decency, had a hard time getting dates.

We are also attracted to certain people for less "logical" reasons, such as the degree to which they have strong masculine or feminine physical – and behavioral – characteristics. Women prefer men who are taller, with broad shoulders, a square jaw.... Men prefer women who are shorter than themselves, softer, rounder....

These differences between the sexes is known as **sexual dimorphism**, and the process that leads to these differences is called **sexual selection**. Small functional differences between the sexes can become large nonfunctional ones over many generations. If female birds are instinctively inclined to prefer colorful males – perhaps because colorful males have served to distract predators from ancestral females and their chicks – then a male that is more colorful will have a better chance, and the female with a more intense attraction to color a better chance, and their offspring will inherit their colors and intense attraction to colors and so on and so on... until you reach a point where the colors and the attraction are no longer a plus, but become a minus, such as in the birds of paradise. Some males cannot even fly under the weight of all their plumage.

Human beings are only modestly dimorphic. But boy are we aware of the dimorphisms!

The dimorphism is also found in our behaviors. David Barash puts it so: "Males tend to be selected for salesmanship; females for sales resistance." Females have a great deal invested in any act of copulation: the limited number of offspring she can carry, the dangers of pregnancy and childbirth, the increased nutritional requirements, the danger from predators...all serve to make the choice of a mate an important consideration. Males, on the other hand, can and do walk away from the consequences of copulation. Note, for example, the tendency of male frogs to try to mate with wading boots: As long as some sperm gets to where it should, the male is doing alright.

So females tend to be more fussy about who they have relations with. They are more sensitive to indications that a particular male will contribute to their genetic survival. One of the most obvious examples is the attention many female animals pay to the size and strength of males, and the development of specialized contests, such as those of antlered and horned animals, to demonstrate that strength.

There are less obvious things as well. In some animals, males have to show, not just strength, but the ability to provide. This is especially true in any species which has the male providing for the female during her pregnancy and lactation – like humans! Sociobiologists suggest that, while men find youth and physical form most attractive, women tend to look for indications of success, solvency, savoir-faire. It might not just be a cultural fluke that men bring flowers and candies, pay for dinner, and so forth.

Further, they suggest, women may find themselves more interested in the "mature" man, as he is more likely to have proven himself, and less interested in the "immature" man, who presents a certain risk. And women should be more likely to put up with polygyny (i.e. other wives) than men with polyandry (other husbands): Sharing a clearly successful man is better in some cases than having a failure all to yourself. And, lo and behold, polygyny is even more common than monogamy, while polyandry is found in perhaps two cultures (one in Tibet and the other in Africa), and in both it involves brothers "sharing" a wife in order not to break-up tiny inherited properties..

Taking it from the other direction, males will tolerate less infidelity than females: Females "know" their children are theirs; males never know for sure. Genetically, it matters less if males "sow wild oats" or have many mates or are unfaithful. And, sure enough, most cultures are harder on women than men when it comes to adultery. In most cultures, in fact, it is the woman who moves into the husband's family (virilocality) – as if to keep track of her comings and goings.

From our culture's romantic view of love and marriage, it is interesting to note that in most cultures a failure to consummate a marriage is grounds for divorce or annulment. In our own culture, infertility and impotence

are frequent causes of divorce. It seems reproduction is more important than we like to admit.

Of course, there is a limit to the extent to which we generalize from animals to humans (or from any species to any other), and this is especially true regarding sex. We are very sexy animals: Most animals restrict their sexual activity to narrowly defined periods of time, while we have sex all month and all year round. We can only guess how we got to be this way. Perhaps it has to do with the long-term helplessness of our infants. What better way to keep a family together than to make it so very reinforcing!

Children

That brings us to children, our attraction to them, and their attraction to us. Adults of many species, including ours, seem to find small representatives of their species, with short arms and legs, large heads, flat faces, and big, round eyes... "cute" somehow – "sweet," the sociobiologist might point out. It does make considerable evolutionary sense that, in animals with relatively helpless young, the adults should be attracted to their infants.

The infants, in turn, seem to be attracted to certain things as well. Goslings, as everyone knows, become attached to the first large moving object they come across in the first two days of life – usually mother goose (occasionally Konrad Lorenz or other ethologists). This is called **imprinting**. Human infants respond to pairs of eyes, female voices, and touch.

The goslings respond to their sign-stimulus with **the following response**, literally following that large moving object. Human infants, of course, are incapable of following, so they resort to subterfuge: the broad, full bodied, toothless smile which parents find overwhelmingly attractive.

Sociobiologists go on to predict that mothers will care for their children more than fathers (they have more invested in them, and are more certain of their maternity); that older mothers will care more than younger mothers (they have fewer chances of further procreation); that we will be more solicitous of our children when we have few (or only one!) than when we have many; that we will increase our concern for our children as they get older (they have demonstrated their survival potential); and that we will tend to push our children into marriage and children of their own.

Helping

Care – helping behavior – is likely when it involves our children, parents, spouses, or other close relations. It is less and less likely when it involves cousins or unrelated neighbors. It is so unusual when it involves strangers or distant people of other cultures and races that we recall one story – the good Samaritan – nearly 2000 years after the fact.

Sociobiologists predict that helping decreases with kinship distance. In fact, it should occur only when the sacrifice you make is outweighed by the advantage that sacrifice provides the genes you share with those relations. The geneticist J. B. S. Haldane supposedly once put it this way: "I'd gladly give my life for three of my brothers, five of my nephews, nine of my cousins...." This is called **kin selection**. Altruism based on genetic selfishness!

One kind of "altruistic" behavior is **herd behavior**. Some animals just seem to want to be close, and in dangerous times closer still. It makes sense: By collecting in a herd, you are less likely to be attacked by a predator. Mind you, sometimes you may find yourself on the outside of the herd – but the odds are good that

the next time you'll be snugly inside.

Another kind is called **reciprocal altruism**. A prairie dog who sees a predator will begin to yelp loudly, for example. This warns the rest of his community, although it draws the predators attention to the one doing the yelping!

Herd behavior and reciprocal altruism work for the same reason that kin selection works: It caters to **inclusive fitness**: A slight reduction of my own survival probabilities is more than balanced by the survival of relatively close relations. Some animals even help any member of their own species, with the instinctual "understanding" that they may be the beneficiaries the next time they need help themselves.

Robert Trivers has suggested that people engage in a more sophisticated form of reciprocal altruism, shared only with a few of the more advanced creatures of the world. Here you would be willing to sacrifice for someone else if it is understood that that specific other will do the same for you, or reciprocate in some other way, "tit for tat." Clearly, this requires the ability to recognize individuals and to recall debts!

Other geneticists have pointed out that, if there is a genetic basis for reciprocal altruism, there will also be some individuals that **cheat** by allowing others to do for them without ever meeting their own obligations. In fact, depending on the advantages that reciprocal altruism provides and the tendency of altruists to get back at cheaters, cheaters will be found in any population. Other studies have shown that "sociopathy," guiltless ignoring of social norms, is found in a sizable portion of the human population.

There is, of course, no need for a human being to be 100% altruist or 100% cheat. Most of us (or is it all of us?), although we get angry at cheats, are quite capable of cheating when the occasion arises. We feel guilt, of course, but we can cheat. A large portion of the human psyche seems to be devoted to calculating our chances of success or failure at such shady maneuvers. More on this later.

Aggression

Like many concepts in social psychology, aggression has many definitions, even many evaluations. Some think of aggression as a great virtue (e.g. "the aggressive businessperson"), while others see aggression as symptomatic of mental illness.

The fact that we do keep the same word anyway suggests that there is a commonality: Both positive and negative aggression serve to enhance the self. The positive version, which we could call assertiveness, is acting in a way that enhances the self, without the implication that we are hurting someone else. The negative version, which we might call violence, focuses more on the "disenhancement" of others as a means to the same end.

Although the life of animals often seems rather bloody, we must take care not to confuse **predation** – the hunting and killing of other animals for food – with aggression. Predation in carnivorous species has more in common with grazing in vegetarian species than with aggression between members of the same species. Take a good look at your neighborhood cat hunting a mouse: He is cool, composed, not hot and crazed. In human terms, there is not the usual emotional correlate of aggression: anger. He is simply taking care of business.

That taken care of, there remains remarkably little aggression in the animal world. But it does remain. We find it most often in circumstances of **competition** over a resource. This resource must be important for "fitness," that is, relevant to one's individual or reproductive success. Further, it must be restricted in abundance: Animals do not, for example, compete for air, but may for water, food, nesting areas, and mates.

It is the last item – mates – that accounts for most aggression in mammals. And it is males that are most noted for this aggression. As we mentioned earlier, females have so much at stake in any act of copulation –

so many months gestation, the increased energy requirement, susceptibility to attack, the dangers of birth, the responsibility of lactation – that it serves their fitness to be "picky" when looking for a partner. If females are picky, males must be show-offs: The male must demonstrate that he has the qualities that serve the female's fitness, in order to serve his own fitness. Deer are a good example. Mind you, this need not be conscious or learned; in all likelihood, it is all quite instinctual in most mammals. It may possibly have some instinctual bases in us as well.

Some of his aggressiveness may in fact be mediated by **testosterone**, the "male" hormone. Inject testosterone into female mice and their threshold for aggressive behavior goes down. Remove testosterone from male mice (by castrating the poor things) and their thresholds go up. But I must add that testosterone does not cause aggression, it just lowers the threshold for it.

But females in many species can be quite aggressive (such as female guinea pigs), and females in any species can be extremely aggressive in certain circumstances (such as when facing a threat to her infants). In human societies, the sociological statistics are clear: Most violent crime is committed by men. But we have already noticed that, as women assert their rights to full participation in the social and economic world, those statistics are changing. Time will tell the degree to which testosterone is responsible for aggression in people.

Nevertheless, males engage in a great deal of head-butting. But one can't help but notice that these contests "over" females seldom end in death or even serious injury in most species. That is because these contests are just that: contests. They are a matter of **displays** of virtues, and they usually include actions that serve as sign stimuli to the opponent that the contest has ended in his favor: **surrender signals**. Continued aggression is of little advantage to either the loser or the winner. Even male rattlesnakes don't bite each other!

Territoriality and **dominance hierarchies** – once thought to be major focuses of aggressive behavior – seem to be relatively less significant. Animals tend to respect territorial and status claims more than dispute them. It is only when circumstances, whether natural or humanly created, are out of the ordinary that we see much aggression. And low food supplies likely have little to do with aggression. Southwick, studying Rhesus monkeys in the London Zoo, found that reducing the food supplies by 25% had no effect on the amount of aggression found, and reducing the food supplies by 50% actually decreased aggression! We find the same thing among primitive people.

Aggression in Human Beings

So why so much aggression in people? One possibility is our lack of biological restraints. Sociobiologists predict that animals that are poorly equipped for aggression are unlikely to have developed surrender signals. Man, they say, is one of these creatures. But we developed **technology**, including a technology of destruction, and this technology "evolved" much too quickly for our biological evolution to provide us with compensating restraints on aggression. Experience tells us that guns are more dangerous than knives, though both are efficient killing machines, because a gun is faster and provides us with less time to consider our act rationally – the only restraint left us.

Another problem is that we humans live not just in the "real" world, but in a **symbolic** world as well. A lion gets aggressive about something here-and-now. People get aggressive about things that happened long ago, things that they think will happen some day in the future, or things that they've been told is happening. Likewise, a lion gets angry about pretty physical things. Calling him a name won't bother him a bit.

A lion gets angry about something that happens to him personally. We get angry about things that happen to our cars, our houses, our communities, our nations, our religious establishments, and so on. We have extended our "ego's" way beyond our selves and our loved ones to all sorts of symbolic things. The response to flag burning is only the latest example.

If aggression has an instinctual basis in human beings, we would expect there to be a sign stimulus. It would certainly not be something as simple as bright red males during mating season, as in stickleback fish. If we go back to the idea of competition as a fertile ground for aggression, we notice that **frustration** is a likely candidate. There are two of you who want the same thing; if one grabs it, the other doesn't get it and is unhappy; so he takes it, and now the other is unhappy; and so on. Goal-directed behavior has been blocked, and that is frustration.

Variations on that theme abound: We can be frustrated when an on-going behavior is interrupted (trying tripping someone); we can be frustrated by a delay of goal achievement (cut in front of someone on line at the supermarket); or we can be frustrated by the disruption of ordinary behavior patterns (cause me to forego my morning coffee). We are flexible creatures.

But we must beware here: Other things can lead to aggression besides frustration (or aren't highly paid boxers engaged in aggression?) and frustration can lead to other things besides aggression (or doesn't social impotence lead to depression?). Further, as Fromm points out, frustration (and aggression) is in the eyes of the beholder. He feels that the frustration must be experienced as unjust or as a sign of rejection for it to lead to aggression.

Sociobiology "versus" Culture

Many psychologists, sociologists, anthropologists, and others are wary of the explanations – convincing though they sometimes are – of the sociobiologists: For every sociobiological explanation, we can find a cultural explanation as well. After all, culture operates by the same principles as evolution.

There are many different ways to do any one task, but in the context of a certain physical environment and a certain culture, some ways of doing things work better than others. These are more likely to be "passed on" from one generation to the next, this time by learning.

Now, cultures need to accomplish certain things if they are to survive at all. They must assure effective use of natural resources, for example, which might involve the learning of all sorts of territorial and aggressive behaviors, just like in sociobiological explanations. And they must assure a degree of cooperation, which might involve learning altruistic behaviors, rules for sharing resources and for other social relationships, just like the ones in sociobiological explanations. And they must assure a continuation of the population, which might involve certain courtship and marital arrangements, nurturant behaviors, and so on, just like in sociobiological explanations.

If a society is to survive – and any existing society has at least survived until now – it must take care of the very same issues that genetics must take care of. And, because learning is considerably more flexible than evolutionary adaptation, we would expect culture to tend to replace genetics. That is, after all, only evolutionary good sense!

So do we have instincts? If instincts are defined as automatic reflex-like connections – no, probably not. But define instincts as "strong innate tendencies toward certain behaviors in certain situations" – yes, we probably do. The important point is that we (unlike animals) can always say no to our instinctual behaviors, just like we can say no to our learned ones!

If you are interested in learning more about sociobiology and its impact on psychology, go to the [Center for Evolutionary Psychology](#). See especially their [Primer](#) for a more sophisticated overview of the topic!

The Romantic Philosophers

Romanticism

Empiricism would continue on to the present day. It would become increasingly materialistic in French philosophy, culminating in the reductionism of **Auguste Comte** (1798-1857), wherein all human experience is reduced to biology, chemistry, and ultimately physics. Rationalism, too, continues to the present day, reaching its peak in **Georges Hegel's** (1770-1831) idealism of the Absolute. Hegel held that all human activity is nothing more than the working of the universe as it slowly and inevitably progresses towards ultimate Godhood.

In both empiricism and rationalism (and materialism and idealism), the human, especially the individual human person, gets lost – either in the eternal bumping of atoms or in the grand scheme of God-making. Our thoughts and feelings are nothing of any importance either way! We are just carbon molecules or the twitchings of eternity.

Some philosophers were taken aback by this tendency, both before and after Comte and Hegel. They felt that, for human beings, it was our own day-to-day living that was the center of our search for the truth. Reason and the evidence of our senses were important, no doubt, but they mean nothing to us unless they touch our needs, our feelings, our emotions. Only then do they acquire **meaning**. This "meaning" is what the Romantic movement is all about.

I will focus on several philosophers that I believe most influenced psychology. First is Jean-Jacques Rousseau, who is often considered the father of Romanticism. And the last is Friedrich Nietzsche, who is sometimes considered the greatest Romantic. Afterwards, we will look at the commonalities among these philosophers that let us talk of a Romantic Movement.

Jean-Jacques Rousseau (1712-1778)

No history of psychology is complete without a look at Jean-Jacques Rousseau. He has influenced education to the present day, philosophy (Kant, Schopenhauer...), political theory (the French Revolution, Karl Marx...), and he inspired the Romantic Movement in Philosophy, which in turn influenced all these things, and psychology, once again.

Plus, he's one of the most colorful characters we have and, as an added bonus, he has left a particularly revealing autobiography in **The Confessions**.

He was born in Geneva, Switzerland, in 1712 to the watchmaker Isaac Rousseau and his wife Suzanne Bernard Rousseau. Although a Calvinist, Isaac was also a bit unstable, and left his wife and first son, returned to father Jean-Jacques, then left again. His mother died one week after Jean-Jacques was born, and he was raised by an aunt and uncle.

they sent him off to boarding school in the country where, he says, he learned "all the insignificant trash that has obtained the name of education." The experience did, however, serve as the start of his love-affair with rural life.

At twelve years old, he returned to his aunt and uncle. There apprenticed to a watchmaker, he developed two other personal qualities: The constant beatings from his master (as well as at school) led him to lying and idleness; and adolescence led him to develop a rather bizarre romantic streak. He would spend much of his life falling in love.



At sixteen, he ran away from home with no money nor possessions. A priest led him to baroness Mme de Warens, a 29 year old beauty who apparently had a soft spot for losers and potential converts. Her influence led him to convert to Catholicism, though he was not yet ready to give up his exhibitionism nor his desire to be spanked by lovely ladies. He entered a seminary in 1729, but was promptly dismissed. He eventually developed an on-again, off-again physical relationship with the lovely Mme Warens.

In the mean time, he walked all over the countryside, often long distances. He loved the woods, mountains, and nature itself. He served as an occasional tutor and music teacher, but spent much of his time reading Enlightenment authors. Voltaire's work turned him to a Nature worship quite congenial to his personality.

In 1742, when he was 30 years old, he left for Paris. He quickly befriended the political writer Diderot, who managed to help him get a job as a secretary at the French Embassy in Venice. He was dismissed because of his insolent nature.

In 1746 he met and fell in love with Therese Levasseur, a simple-minded laundress and seamstress. They together had four children, all of whom were sent to orphanages. Keep in mind that that was a common response to poverty in those days (i.e. from the fall of Rome to World War II!). He did feel considerable remorse about it later, but admitted that he would have made a really lousy father! No one doubts him on that.

He worked as a secretary to various aristocrats and spent quite some time composing music. He even rewrote an operetta by Voltaire and wrote to him. A literary contest with a monetary prize caught his attention and, in 1750, he won with **Discours sur les arts et les sciences** – a powerful attack on civilization.

This was the first time we see his ideas about the natural goodness of man. And although we think of him as an Enlightenment thinker, this thesis was actually anti-Enlightenment, anti-philosophy, anti-reason, anti-Voltaire, and even anti-printing press! The good life, he was saying, is the simple life of the peasants. This conception of "back to nature" involved, of course, a romanticized notion of nature, and stands in stark contrast to the nature of jungles and deserts!

1752 was another active year. He wrote his comedy **Narcisse**. His operetta **Le devin du village** was successfully presented to the King. Unfortunately, his illness – he suffered from a variety of painful and humiliating bladder problems – kept him from meeting the King, and he forfeited a pension.

In 1753, another competition was announced. Rousseau's entry, **Discourse sur l'origine et les fondements de l'inegalite parmi les hommes**, won and was published two years later.

In this piece, he accepted biological inequalities, but argued that there were no natural basis for any other inequalities – economic, political, social, or moral! These, he said, were basically due to the existence of private property and the need to defend it with force. Man is good, he argued, but society, which is little more than the reification of greed, corrupts us all.

He admits that it is no longer possible for us to leave civilized society now. It has, in fact, become a part of our nature! The best we can do is to lead simpler lives with fewer luxuries with the simple morality of the gospels to guide us.

In his article on economics for the **Encyclopedia**, he suggest that it would help if we had a graduated income tax, a tax on luxuries (and none on necessities), and national free public education.

In 1756, he moved with Therese and her elderly mother into "the Hermitage," a cottage lent to him by Mme d'Épinay. There he wrote a novel (or "romance") called **Julie, ou la nouvelle Heloise**, referring to the Heloise of Heloise and Abelard fame. It became perhaps the most famous novel of the 1700s.

On the other side, he alienated his friends with unpleasant letters and his rudeness towards his benefactress Mme D'Épinay. Even his oldest friend, Diderot, called him mad. In a huff, he left the Hermitage.

In 1762, Rousseau published both **Émile** and **The Social Contract**. The first line of **The Social Contract** is the most famous: "Man is born free, and he is everywhere in chains." The purpose of the rest of the book was to describe a society that would instead preserve that freedom.

"The social contract" is an admittedly mythological contract among individuals to surrender some of their freedoms to ensure a community which respects the individual and, thereby, preserves as much freedom as possible. This idea, combined with Locke's thoughts on government, were to inspire the founding fathers of the new United States.

It should be noted, though, that at the end of the book, Rousseau does prescribe death as the punishment for anyone who, by their actions, shows that they do not hold the common values of the community! The French Revolution would show more clearly than the American what a double-edged sword a philosophy such as Rousseau's can be!

Émile was far more sedate. It is a treatise on child-rearing, from the man who sent his four children to orphanages! Turns out, though, he had some pretty good advice.

He condemned all forms of education that use force. Instead, he promoted education that nurtured the natural unfolding of a child's potentials. This in a time when it was thought that if you didn't beat children regularly with a good sized stick, they would grow up spoiled! And Nature, he said, is to be the child's primary teacher, with freedom to explore the major teaching method.

Basically, he says, the child learns by gradual adaptation to necessities, and by imitation of those around him. Education should be primarily moral until the child is twelve, when intellectual education begins. Religious education should be held off until the child is 18. This way, the child can develop reasonable religious beliefs, rather than unthinking acceptance of mythology and miracles.

The book is beautifully written, but many would say almost naively idealistic. It would be a great influence in Europe and later in the United States. Maria Montessori in Italy, for example, based many of her ideas on Rousseau, as did John Dewey in the US. What we now call progressive education and learning by doing come basically from **Émile**!

The great philosophers of his time laughed at him – but the clergy was outraged! Rousseau's friends warned him and encouraged him to flee. In 1762, the French parlement ordered all copies of *Emile* confiscated and burned. Rousseau fled to Switzerland, only to have both his books burned in Calvinist Geneva.

He begged Frederic the Great for asylum in Neuchâtel. There he lived, more eccentric than ever. And yet he was the idol of women everywhere, and his publishers begged him for more. He gave them more, primarily in the form of essays or letters to his critics.

But the local ministers in Neuchâtel were also upset about his writings, and a local sermon led to an attack on Rousseau's house. He and Therese moved again, to a lone cottage on a tiny island in a lake in Switzerland. But he was again ordered to leave, which he did, first to Strasbourg, then to England at the invitation of David Hume in 1766.

At first in London he was the talk of the town, and everyone wanted to meet him. But he tired of this quickly and asked Hume to find him a place in the country. There, Rousseau, Therese, and their dog Sultan put quite a strain on their hosts' hospitality.

Rousseau began to read critical articles in the British press. Already rather paranoid, he responded to them as if there were a conspiracy against him, and even accused Hume of being a part of it. He and Therese "escaped" from England back to France.

Although technically still in danger of arrest in France, he nevertheless enjoyed the reception his fans gave him. But fearing for his life, he fled into the countryside to wander anonymously. In 1768, he finally married his Therese.

She begged him to go back to Paris, so they did (under pseudonyms). There he copied music for a living, and also finally finished, in 1770, his autobiography.

He continued to write, some of his most beautiful work as well as some of his most paranoid, until 1778. He had moved into a cottage offered by the marquis de Girardin, where he happily studied the local flora, when he suffered a stroke. Therese tried to move him onto his bed, but he fell again and cut his head. By the time

the Marquis got to him, he was dead.

He was buried on the estate, and his grave became a pilgrimage site. He was later moved to the Pantheon in Paris, and laid to rest not far from, of all people, Voltaire.

Johann Wolfgang von Goethe (1749-1832)

We do not have to visit a madhouse to find disordered minds;
our planet is the mental institution of the universe.

Goethe



Goethe was born in 1749 in Frankfurt-am-Main in Germany, the oldest of six children – although only he and a sister survived into adulthood. His father, Johann Kaspar Goethe, was a well-to-do lawyer and amateur scholar, but a failure in politics and with an unpleasant disposition. His mother, Katharina Elisabeth Textor was considerably more pleasant, and was the daughter of the bürgermeister (mayor) of Frankfurt.

Young Goethe was a handsome and talented youth, learned languages easily, and was interested in music and art. He entered the University of Leipzig to study law, but a disappointment in love led him to sickness and depression, and he left school. In 1771, however, he received his law degree from the University of Strasbourg.

His early reading of Bayle's **Dictionary** led him to renounce his Christianity as a teenager and become an atheist. He later mellowed a bit, and adopted a pantheism modeled after Spinoza's.

In 1774, he wrote **Die Leiden des jungen Werthers (the Sorrows of Young Werther)**, a tragic love story that, though panned by the critics, was wildly successful, especially among young romantic intellectuals. The book concludes with a suicide which was, sadly, imitated by a number of love sick readers. Like many of his works, the story emphasized the tensions between the nature of the individual and the restrictions of society.

The following year, he was invited to join the Duke of Saxony-Weimar at court. At first, he was just an "ornament" there, but later he performed various real political duties, including inspections of mines and the establishment of weather observatories.

In 1782, he was inducted into the nobility, which permitted him to add "von" to his name. Because of his fame and status in Weimar, he met and befriended a number of young poets, including Schiller and Herder.

Since his teens, Goethe was given to falling in love, yet apparently unable to commit himself to one woman or the institution of marriage. His longest and most intense relationship began around 1775 with Charlotte von Schardt, a married woman who had had seven children (though only four survived). He would write long and romantic letters to her for most of his life.

He did eventually set up a household with a young working-class girl named Christiane Vulpius. She bore a child on Christmas day in 1789.

In 1801, Goethe became quite ill, and his recovery took many years. Toward the end of his illness, Napoleon defeated the Prussians at Jena and marched into Weimar. His troops attempted to take over Goethe's house, and Christiane physically protected him. He finally married her.

Goethe was a strong admirer of Napoleon, and visited him in 1808 at the emperor's invitation. Goethe also visited with Beethoven in 1812.

Goethe's greatest work is his two-part play **Faust**. Although he began writing it in 1773, it would not be finished until 1831. The first part, however, could stand alone, and it was completed in 1808. Its theme was human freedom and the power of passion, which Faust discovers after he wagers his soul in a devil's bargain with Mephistopheles.

[An interesting aside: Goethe's Faust creates an artificial man in his laboratory. This influenced a certain Mary Shelley, author of **Frankenstein** (perhaps the first science fiction novel). She even places her story in a 13th century castle she had seen which belonged to the old (and colorful) German family Frankenstein, a castle Goethe was also quite familiar with!]

In addition to his poetry, novels, and plays, Goethe spend considerable time on science. He studied medicine, anatomy, physics, chemistry, botany, and meteorology.

In 1792, he completed the two part **Beiträge zur Optik (Contributions to Optics)**, and in 1810 the three part **Zur Farbenlehre (On the Theory of Colors)**. He truly believed that it was these works that would be his greatest contributions. Instead, few scientists approved of them, and they were to make little serious impact on the field. His work would make an impression on various artists, though, including Turner, Klee, and Kandinsky. His approach was really more phenomenological than experimental, and his work reflected more on the subjective experiences of color and light than on their physics.

He also wrote a book called **The Metamorphosis of Plants**, which suggested that all plants are just variations on a primitive plant he called the **Urpflanze**. He coined the term **morphology** along the way, and showed the relationship of human beings to animals with his discovery of the human intermaxillary bone (just above your upper teeth), just where it is in lower animals.

His wife Christiane died in 1816. His lifelong love Charlotte died in 1827. The Duke died the following year. And his last remaining child died in 1830. Suffering from sickness and depression, Goethe himself finally died, March 22, 1832, one year after finishing the second half of his masterpiece **Faust**.

Arthur Schopenhauer (1788-1860)

Arthur Schopenhauer was born February 22, 1788 in Danzig, Prussia (now Gdansk in Poland). His father was a successful businessman, and his mother a novelist. Young Arthur was moved around Europe quite a bit, which allowed him to become fluent in several languages, and to develop a deep love of nature.

In 1805, his father died, and he tried a business career. He lived with his mother for a while in Weimar, and she introduced him to Goethe. He went on to study medicine at the University of Göttingen and philosophy at the University of Berlin, and ultimately received his doctorate from the University of Jena in 1813. Later, he worked with Goethe on Goethe's studies on color.

In 1819, he published his greatest work, **Die Welt als Wille und Vorstellung (The World as Will and Idea)**.

To Schopenhauer, the phenomenal world is basically an illusion. The true reality, Kant's "thing-in-itself," he refers to as **Will**. Will, perhaps an odd term to us today, is more like the Tao in Chinese philosophy: It is out



of the Will that everything derives. But it has more the qualities of a force, and pushes or drives what we perceive as the phenomenal world.

Will is, you could say, the inner nature of all things. So, if you want to understand something's – or someone's – inner nature, you need only look within yourself. So the Will also drives us, through our instincts. This concept would influence a young Sigmund Freud a generation later.

Schopenhauer, profoundly influenced by his reading of Buddhist literature, saw life as essentially painful. We are forced by our natures, our instincts, to live, to breed, to suffer, and to die. Schopenhauer is often described as "the great pessimist!"

For the world is Hell, and men are on the one hand the tormented souls and on the other the devils in it....

If you imagine... the sum total of distress, pain, and suffering of every kind which the sun shines upon in its course, you will have to admit it would have been much better if the sun had been able to call up the phenomenon of life as little on the earth as on the moon....

To our amazement we suddenly exist, after having for countless millennia not existed; in a short while we will again not exist, also for countless millennia. That cannot be right, says the heart.

The question, of course, is how does one get past this suffering? One way he recommends is **esthetic salvation** – seeing the beauty in something, or someone. When we do this, we are actually looking at the universal or essence behind the scene, which moves us in turn towards the universal subject within ourselves. This quiets the will that forces us into the phenomenal world. Schopenhauer believed that music was the purest art – one step from will.

A second way to transcend suffering is through **ethical salvation** – compassion. Here, too, it is the recognition of self-in-others and others-in-self that leads to a quieting of the will.

But these are only partial answers. The full answer requires **religious salvation** – asceticism, the direct stilling of all desires by a life of self-denial and meditation. Without the will, only nothingness remains, which is Nirvana.

Schopenhauer lived many years of his life a bitter and reclusive man, unable to deal with his lack of success in life. He began publishing his works again in 1836, and intellectuals all over Europe began to develop an interest in him.

Sadly, Schopenhauer developed heart problems and on September 21, 1860, he died. After his death, he would powerfully influence such notables as the composer Richard Wagner, Friedrich Nietzsche, Thomas Mann and many other writers.

Søren Aabye Kierkegaard (1813-1855)

There are, as is known, insects that die in the moment of fertilization.
So it is with all joy: life's highest, most splendid moment of enjoyment is accompanied by death.
Kierkegaard

Søren Kierkegaard was born in Copenhagen on May 5, 1813, the youngest of seven children. His father, Michael Pedersen Kierkegaard, was in the hosiery business. He was a powerful man who held to a particularly gloomy Christianity, obsessed with guilt over having once cursed God. His mother was Ane Sørensdatter Lund, a servant of the Kierkegaard's.

Two of Søren's brothers and two of his sisters died. By 1834, his mother had died as well, and Kierkegaard became nearly as depressed as his father. He lost his faith and turned to a hedonistic life-style, but had a religious experience in 1838. He received his theology degree in 1840, and proposed to Regine Olsen, daughter of a prominent Copenhagen government official.

No one knows precisely why, but in late 1841, he broke off the engagement, which led to considerable negative social press. It seems to have been the pivotal crisis in his life, and he abruptly left to Berlin to study.

When he returned, he finished a manuscript he had been working on, and in 1843 published **Either/Or**. It takes the form of an argument about how to live life between an "aesthetic" man and an "ethical" man – very probably reflecting two aspects of Kierkegaard's own soul.



The aesthetic man is basically a hedonist and an atheist. Although he is portrayed as a refined gentleman, his sections of the book are rambling, suggesting that his life is likewise without focus. The ethical man is a judge, and his arguments are far more orderly and eloquent: He spends considerable time analyzing the ancient Roman emperor Nero and his mental states.

Also in 1843, he published his famous book **Fear and Trembling**, which retells the story of Abraham and his near-sacrifice of his son. This time, Kierkegaard compares the ethical response – it is clearly wrong to kill one's own son – with a religious response, which is reflected in Abraham's faith in his God.

In his various books, Kierkegaard develops his three "stages" or competing life philosophies: The **aesthetic** person, who lives in the moment and lacks commitment; the **ethical** person, who is in fact committed to his ideals; and the **religious** person, who recognizes the transcendent nature of true ideals. Notice the similarity to Schopenhauer, although for Schopenhauer "aesthetic" refers to a love of art and music, not hedonism.

Throughout his work, he was concerned with **passions**. He defined **anxiety**, for example, as "the dizziness of freedom." **Despair** is what the hedonist feels when he finally recognized the emptiness of his life. **Guilt** is what the ethical man feels when he inevitably discovers his inability to forgive himself. These definitions would profoundly influence a number of later philosophers and writers.

In 1849, he published **Sickness unto Death**, which was his strongest call to the conventional Christians of Copenhagen to take what Kierkegaard called "**a leap of faith**" into a more personal kind of religion. But his community is not quite ready for this passionate brand of Christianity, and he was severely criticized by the religious powers of Denmark.

Kierkegaard is often considered the first existentialist, mostly because of the way he used the word **existence**. He said that God doesn't exist because he is eternal. Only people exist, because they are always an unfinished product. And the nature of existence is, first, that it is the domain of the individual, and second, that individual must take responsibility for his or her own creation.

But Kierkegaard noted that his was not a "system" of philosophy. Human existence is an ongoing process of creation, and cannot be encompassed by any "system." This has been a central theme in existentialism ever since.

Kierkegaard died on October 2, 1855, of spinal paralysis. He would not take communion, and he asked that no clergy participate in his funeral. His epitaph reads "The Individual."

Friedrich Wilhelm Nietzsche (1844 – 1900)

I fear animals regard man as a creature of their own kind which has in a highly dangerous fashion lost its healthy animal reason-as the mad animal, as the laughing animal, as the weeping animal, as the unhappy animal. – Nietzsche

Second only to Rousseau in the impact he had on Psychology is Friedrich Wilhelm Nietzsche. He was born in Röcken, in Prussia Saxony, on October 15, 1844, named after Friedrich Wilhelm IV, King of Prussia, who had the same birthday. Nietzsche's father was a minister – one of many in the family – who had tutored several members of the royal family. His mother was a puritanical housewife.

When Friedrich was 18, he lost his faith – which would remain a central issue for the rest of his life. And he said his life was changed as well by his reading of Schopenhauer a few years later while a student at the University of Leipzig.

When he was 23, he was drafted into the Prussian army – but he fell off a horse, hurt his chest, and was released.

He received an appointment as professor of philology (classical languages and literature) at the University of Basel at the tender age of 24, a year before he received his Ph.D. Near Basel lived the famous Richard Wagner, and Nietzsche was invited to Christmas dinner in 1869. Wagner's grandiose and romantic operas were to influence Nietzsche's view of life for some time to come.

He served a brief stint as a volunteer medical orderly during the Franco-Prussian War, during which he contracted diphtheria and dysentery, which damaged his health permanently.

After returning to Basel, he published his first book in 1872 – inspired by Wagner – called **The Birth of Tragedy out of the Spirit of Music**. It was in this book that he introduced the contrast of the **Dionysian** and **Apollonian**. Dionysus was the god of wine and revelry, living for the moment. Apollo was the god of peace, order, and art. The one lacks discipline, but the other lacks, as we would say today, soul.

In 1879, because of his seriously deteriorating health, he was forced to retire from teaching. He published **Human, All Too Human** – an analysis of emotion – in parts from 1878 through 1880. During this time also, he fell in love, although briefly, with the famous Lou Salomé (later a confidant of Sigmund Freud's!).

Heartbroken, and perhaps recognizing that he was destined for bachelorhood, he retired high into the Alps to write his master work, **Thus Spake Zarathustra**, published in 1883 through 1885. Here, he made a heroic effort at addressing the pessimism of Schopenhauer. Nietzsche felt that religion had failed miserably to provide man with meaning. So now that God was "dead," we needed to stop looking to the skies and start providing that missing meaning ourselves. The people he saw as having accomplished this transition he called "**Über-menschen**," usually translated as supermen. But, he notes, supermen have not arrived as yet, and we must be satisfied to serve as a bridge to that future.

The book is a masterpiece by any standard, yet Nietzsche remained an unknown. His health continuing to deteriorate, he was cared for by his sister, Lisbeth Förster-Nietzsche. She, however, married an anti-semite



who Nietzsche abhorred and moved to a commune in Paraguay!

Nietzsche then lived in various rooming houses all over Italy and Switzerland. His eyesight went from bad to worse, and his headaches overwhelmed him. He stopped writing books and instead wrote aphorisms (short comment), which he then collected into books.

Beyond Good and Evil (the best introduction to his ideas) came out in 1886, and **The Genealogy of Morals** in 1887. In these books, he makes clear his great distinction between **Herren-Moral** and **Herden-Moral**, that is, the morality of lords and the morality of the herd.

The morality of the herd is what he calls traditional Judeo-Christian morality: It is, he says, an ethic of helplessness and fear. With this morality, we keep the powerful and talented under control by appealing to virtues such as altruism and egalitarianism. Secretly, it is, like all motives, a "will to power" – but a sly, manipulative one. We cry "I am weaker than you, but I am still better than you!"

The morality of lords, on the other hand, is based on the manly virtues of courage, honor, power, and the love of danger. It is pagan, western, teutonic. The only rule, he said, is do not betray a friend.

Although he was not anti-semitic, his choice of words would lead the Nazis to use some of them in ways he never intended many years after his death. Ask yourself if the masses of people shouting "Heil Hitler!" and the acts of rounding up minority civilians for work camps and slaughter in any way make you think of courage and honor!

The contrast between these two moralities is in fact a very productive one:

Herden-Moral	Herren-Moral
bourgeoisie	aristocracy
democracy	laissez-faire
welfare	merit
socialism	freedom
egalitarianism	honesty
human rights	purpose
sympathy	
comfort	
decadence	

Nietzsche become increasingly ill and bitter, blind and paranoid. In Turin in January of 1889 he had attempted to protect a horse that was being whipped when he suffered an apoplectic stroke (just like Rousseau) which sent him to an asylum. Some believe his collapse was the result of syphilis, but it could just as well have been due to years of medication. His mother claimed him and took care of him until she died in 1897, when his sister, now back in Germany, took him in.

He was seldom lucid after that. He died August 25, 1900 at the age of 55, of stroke and pneumonia.

A number of his works were published after his collapse, including **The Will to Power** in 1889, which is a collection of aphorisms found in his notebooks, and his autobiography **Ecce Homo** in 1908. **Ecce Homo** illustrates both his brilliance and his insanity very dramatically. Freud called him the most brilliant psychologist who ever lived.

Romanticism in General

Beneath all the variety represented by the Romantics lies a common theme: **Passion**. While the empiricists were concerned with sensory data, and the rationalists were concerned with reason, the romantics looked at consciousness and saw first and foremost its dynamics, purposefulness, striving, desire... passion!

Goethe has Faust say, "*Gefülte is Alles.*" Feeling is everything!

In fact, they saw passion in all life, as a basic category... life as a Darwinian struggle, not just to survive, but to overcome. As such, it could be called instinct; but in humanity, it goes further, and involves an overcoming of nature itself.

"The only reality is this: The will of every center of power to become stronger – not self-preservation, but the desire to appropriate, to become master, to become more, to become stronger," said Nietzsche.

Along with their love of passion came an impatience with, even disgust at, the mediocre, the weak, the irresponsible, the unpassionate.

The romantic's view of the world is a reflection of their view of humanity: The world is rich, full of qualities – color, sound, flavor, feeling – thick, you might say, and not the thin, gray, empty thing as pictured by modern science. They tended to ignore metaphysical speculation as an intellectual game. And for Schopenhauer, passion became the basic form of all reality: a universe pressing to be realized.

A passionate metaphysics requires a passionate epistemology (as opposed to an intellectual or empirical one). First, there is a preference for intuition or insight: As Pascal put it, "*the heart has reasons that reason knows nothing of.*" A holistic understanding is more satisfying than logical, analytical, or experimental explanations. The world is too big for those and has to be embraced rather than picked apart.

And the importance of the subjective is emphasized. All experience is subjective as well as objective. This is a sort of "uncertainty principle" that applies to all sciences, and philosophy, and certainly psychology. Objectivity is simply a meaningless goal. So subjectivity is not something to eliminate, but to understand.

Hence we must go back to life as it is lived, the **Lebenswelt**. We must study whole, meaningful experiences. We might want to go back to ordinary people, perhaps children or primitives, to understand the lived world before it is tainted by our perpetual intellectualization. These tendencies would eventually lead to phenomenology and related methodologies.

Last (and far from least), we must have a passionate morality. The romantics tend to admire the heroic, taking a stand against nature, against the mediocre, against nothingness or meaninglessness. To some extent, the heroic is closely tied to futility: It is often Quixotic, or picaresque. There is an affection for the foolish or unconventional.

Romantic morality is more stoic than epicurean. Meaning, as expressed by virtue, purpose, and courage, is the highest value, not pleasure or happiness as we usually conceive of them.

Some romantics are suspicious of Asian philosophy to the extent that it represents surrender. Nietzsche, among them, considers even the Judeo-Christian tradition "Asian" and weak. Their suspicion is not entirely well-founded: In traditions such as Taoism and Zen Buddhism, for example, "surrender" is valued precisely for the strength it imparts, as demonstrated physically in judo ("gentle way"). Schopenhauer understood this, and his work is clearly colored by Buddhism in particular.

A passionate morality requires freedom, which Goethe considered the greatest happiness, and which was quickly disappearing from empiricist, rationalist, and even religious philosophy. I have to be free to take that courageous stand; to be determined is to be nothing at all.

A little Buddhism sneaks in when Nietzsche speaks of **amor fati**, love of fate: When choices are taken from

you, you can still conquer the moment with your attitude.

Nietzsche said "*God is dead!*" Now, anything goes. You don't have to do anything. Be nice? Why? Be selfish? Why? As Sartre put it, we are "condemned" to freedom. Even when we choose to allow ourselves to be determined, it is our choice. Even Kierkegaard asks us to take a leap of faith that has no justification. So, we have nothing to lean on, no crutch, no "opiate," no excuses.

Freedom means responsibility. We create ourselves, or better, we overcome ourselves, or at least we should. Others just play out their "programs." Freedom requires that we be truly aware, fully conscious. It requires that we be fully feeling, that we not deny but experience our passion. It requires that we be active, involved.

Freedom means creativity, and the romantic prefers the artist over the scientist. These ideas are the foundation for the concept of self-actualization.

The heirs of the romantics are the phenomenologists, existentialists, and humanists of today.

The Quotable Friedrich Nietzsche

On Madness

Madness is something rare in individuals – but in groups, parties, peoples, ages it is the rule. *Beyond Good and Evil*.

I fear animals regard man as a creature of their own kind which has in a highly dangerous fashion lost its healthy animal reason – as the mad animal, as the laughing animal, as the weeping animal, as the unhappy animal. *The Gay Science*.

On Religion

After coming into contact with a religious man I always feel I must wash my hands. *Ecce Homo*.

Two great European narcotics, alcohol and Christianity. *Twilight of the Idols*.

Even today many educated people think that the victory of Christianity over Greek philosophy is a proof of the superior truth of the former – although in this case it was only the coarser and more violent that conquered the more spiritual and delicate. So far as superior truth is concerned, it is enough to observe that the awakening sciences have allied themselves point by point with the philosophy of Epicurus, but point by point rejected Christianity. *Human, all too Human*.

The spiritualization of sensuality is called love: it is a great triumph over Christianity. *Twilight of the Idols*.

On the Self

Active, successful natures act, not according to the dictum "know thyself," but as if there hovered before them the commandment: will a self and thou shalt become a self. *Assorted Opinions and Maxims*.

He who cannot obey himself will be commanded. That is the nature of living creatures. *Thus Spoke Zarathustra*.

I assess the power of a will by how much resistance, pain, torture it endures and knows how to turn to its advantage. *The Will to Power*.

To exercise power costs effort and demands courage. That is why so many fail to assert rights to which they are perfectly entitled-because a right is a kind of power but they are too lazy or too cowardly to exercise it. The virtues which cloak these faults are called patience and forbearance. *The Wanderer and His Shadow*.

On Death

To die proudly when it is no longer possible to live proudly. Death of one's own free choice, death at the proper time, with a clear head and with joyfulness, consummated in the midst of children and witnesses: so that an actual leave-taking is possible while he who is leaving is still there. *Twilight of the Idols*.

On Punishment

Distrust everyone in whom the impulse to punish is powerful! *Thus Spoke Zarathustra*.

A strange thing, our kind of punishment! It does not cleanse the offender, it is no expiation: on the contrary, it defiles more than the offense itself. *Daybreak*.

The Will to Power

What is good? – All that heightens the feeling of power, the will to power, power itself in man. *The Anti-Christ*.

Not necessity, not desire – no, the love of power is the demon of men. Let them have everything – health, food, a place to live, entertainment – they are and remain unhappy and low-spirited: for the demon waits and waits and will be satisfied. *Daybreak*.

My idea is that every specific body strives to become master over all space and to extend its force (its will to power) and to thrust back all that resists its extension. But it continually encounters similar efforts on the part of other bodies and ends by coming to an arrangement ("union") with those of them that are sufficiently related to it: thus they then conspire together for power. And the process goes on. *The Will to Power*.

[Anything which] is a living and not a dying body... will have to be an incarnate will to power, it will strive to grow, spread, seize, become predominant – not from any morality or immorality but because it is living and because life simply is will to power... 'Exploitation'... belongs to the essence of what lives, as a basic organic function; it is a consequence of the will to power, which is after all the will to life. *Beyond Good and Evil*.

On Truth

There are no facts, only interpretations. *Daybreak*.

It is not things, but opinions about things that have absolutely no existence, which have so deranged mankind! *Daybreak*.

Convictions are more dangerous enemies of truth than lies. *Human, all too Human*.

Extreme positions are not succeeded by moderate ones, but by contrary extreme positions. *The Will to Power*.

Why does man not see things? He is himself standing in the way: he conceals things. *Daybreak*.

Mystical explanations are considered deep. The truth is that they are not even superficial. *The Gay Science*.

What are man's truths ultimately? Merely his irrefutable errors. *The Gay Science*.

Over immense periods of time the intellect produced nothing but errors. A few of these proved to be useful and helped to preserve the species: those who hit upon or inherited these had better luck in their struggle for themselves and their progeny. Such erroneous articles of faith... include the following: that there are things, substances, bodies; that a thing is what it appears to be; that our will is free; that what is good for me is also good in itself. *The Gay Science*.

Eternal recurrence

Never yield to remorse, but at once tell yourself: remorse would simply mean adding to the first act of stupidity a second. *The Wanderer and his Shadow*.

What, if some day or night a demon were to steal after you into your loneliest loneliness and say to you: "This life as you now live it and have lived it, you will have to live once more and innumerable times more; and there will be nothing new in it, but every pain and every joy and every thought and sigh and everything unutterably small or great in your life will have to return to you, all in the same succession and sequence - even this spider and this moonlight between the trees, and even this moment and I myself. The eternal hourglass of existence is turned upside down again and again, and you with it, speck of dust!" Would you not throw yourself down and gnash your teeth and curse the demon who spoke thus?... Or how well disposed would you have to become to yourself and to life to crave nothing more fervently than this ultimate eternal confirmation and seal? *The Gay Science*.

The Bad Man

Whoever has overthrown an existing law of custom has always first been accounted a bad man: but when, as did happen, the law could not afterwards be reinstated and this fact was accepted, the predicate gradually changed; history treats almost exclusively of these bad men who subsequently became good men! *Daybreak*.

I know my fate. One day there will be associated with my name the recollection of something frightful – of a crisis like no other before on earth, of the profoundest collision of conscience, of a decision evoked against everything that until then had been believed in, demanded, sanctified. I am not a man. I am dynamite. *Ecce Homo*.

Friedrich Nietzsche: Selection from *Thus Spake Zarathustra*, part four

The Higher Man*

Nietzsche's masterpiece, **Thus Spake Zarathustra**, is the story of a sage who has been living on a mountain contemplating the fate of mankind for many years. When he feels he has some answers to share, he comes down and attempts to preach. First he discovers (in the market-place) that there doesn't seem to be anyone who wants to hear what he has to say. He realizes that he has come down from the mountain too soon, that the people his message was for – "the higher men" – simply don't exist yet. Nevertheless, he gives this speech.

As you read it, keep in mind that what he is preaching is not intended for the ordinary people of today, but for a better people of the future. Some of it seems harsh, even negative. But the message is one we can recognize and sympathize with: We should avoid getting sucked into the conventional, restrained, even shrivelled lives of the ordinary, mediocre people around us but, instead, strive to realize our fullest potentials.

1

When I came to men for the first time, then did I commit the hermit's folly, the great folly: I appeared in the market-place.

And when I spoke to all, I spoke to none. In the evening, however, rope-dancers were my companions, and corpses; and I myself almost a corpse.

With the new morning, however, there came to me a new truth: Then did I learn to say "Of what account to me are market-place and crowd and crowd-noise and long crowd-ears!"

You higher men, learn this from me: In the market-place no one believes in higher men. But if you will speak there, very well! The crowd, however, sputters "We are all equal."

"You higher men," – so sputters the crowd – "there are no higher men, we are all equal; man is man, before God – we are all equal!"

Before God! – Now, however, this God has died. Before the crowd, however, we will not be equal. You higher men, go away from the market-place!

2

Before God! – Now however this God has died! You higher men, this God was your greatest danger.

Only since he lay in the grave have you again arisen. Only now comes the great noontide, only now does the higher man become – master!

Have you understood this word, O my brothers? You are frightened: Do your hearts turn giddy? Does the abyss here yawn for you? Does the hell-hound here yelp at you?

Well! Take heart, you higher men! Only now does the mountain of the human future begin to work. God has died: Now we desire that the Superman live!

* Adapted from *THUS SPAKE ZARATHUSTRA* by Friedrich Nietzsche (1891). translated by Thomas Common. Available at <http://members.aol.com/Magnetar/private/Zarathustra/Z73.html>
Interpretation by C. George Boeree.

3

The most careful ask today "How is man to be maintained?" I, Zarathustra, ask, as the first and only one: "How is man to be surpassed?"

The Superman I have at heart;— that is the first and only thing to me — and not man: Not the neighbour, not the poorest, not the sorriest, not the best.

O my brothers, what I can love in man is that he is an over-coming and a down-going. And also in you there is much that makes me love and hope.

In that you have despised, you higher men, that makes me hope. For the great despisers are the great reverers.

In that you have despaired, there is much to honour. For you have not learned to submit yourselves, you have not learned petty policy.

For today the petty people have become master: They all preach submission and humility and policy and diligence and consideration and the long et cetera of petty virtues.

Whatever is of the effeminate type, whatever originates from the servile type, and especially the crowd-mishmash — that is what wishes now to be master of all human destiny — O disgust! Disgust! Disgust!

They ask and ask and never tire of asking: "How is man to maintain himself best, longest, most pleasantly?" Thereby are they the masters of today.

These masters of today, surpass them, O my brothers: These petty people, they are the Superman's greatest danger!

Surpass, you higher men, the petty virtues, the petty policy, the sand-grain considerateness, the ant-hill politeness, the pitiable comfortableness, the "happiness of the greatest number!"

And rather despair than submit yourselves! And verily, I love you, because you do not know how to live today, you higher men! For thus do you live best!

4

Have you courage, O my brothers? Are you stout-hearted? Not the courage before witnesses, but hermit courage and eagle courage, which not even a God any longer beholds?

Cold souls, mules, the blind and the drunken, I do not call stout-hearted. He has heart who knows fear, but conquers it; who sees the abyss, but with pride.

He who sees the abyss, but with eagle's eyes, he who with eagle's talons grasps the abyss: He has courage.

5

"Man is evil" — so all the wisest ones said to me for consolation. Ah, if only it were still true today! For evil is man's best strength.

"Man must become better and more evil"— so do I teach. The most evil is necessary for the Superman's best.

It may have been well for the preacher of the petty people to suffer and be burdened by men's sin. I, however, rejoice in great sin as my great consolation!

Such things, however, are not said for long crowd-ears. Every word, also, is not suited for every mouth. These are fine far-away things: At them sheep's hooves shall not grasp!

6

You higher men, do you think that I am here to put right what you have put wrong?

Or that I wish henceforth to make snigger couches for you sufferers? Or show you restless, lost, and confused climbers new and easier footpaths?

No! No! Three times No! Always more, always better ones of your type shall succumb, for you shall always have it worse and harder.

Thus only does man grow upwards to the height where the lightning strikes and shatters him: High enough for the lightning!

Out to the few, the long, the remote go my soul and my seeking: Of what account to me are your many little, short miseries!

You do not yet suffer enough for me! For you suffer from yourselves, but you have not yet suffered from man. You would lie if you spoke otherwise! None of you suffers from what I have suffered.

7

It is not enough for me that the lightning no longer does harm. I do not wish to conduct it away: It shall learn to work for me.

My wisdom has accumulated long like a cloud: It becomes stiller and darker. So does all wisdom which shall one day bear lightning.

To these men of today will I not be light, nor be called light. Them will I blind: Lightning of my wisdom! Put out their eyes!

8

Do not will anything beyond your power: There is a bad falseness in those who will beyond their power.

Especially when they will great things! For they awaken distrust in great things, these subtle false-coiners and stage-players –

Until at last they are false towards themselves, squint-eyed, pale cankers, glossed over with strong words, parade virtues and brilliant false deeds.

Take good care there, you higher men! For nothing is more precious to me, and rarer, than honesty.

Is this today not that of the crowd? The crowd however knows not what is great and what is small, what is straight and what is honest: It is innocently crooked, it always lies.

9

Have a good distrust today, you higher men, you enheartened ones, you open-hearted ones! And keep your reasons secret! For this today is of the crowd.

What the crowd once learned to believe without reason, who could refute it to them by means of reason?

And on the market-place one convinces with grand gestures. But reason make the crowd distrustful.

And when truth occasionally triumphs there, then ask yourselves with good distrust: "What strong error has fought for it?"

Be on your guard also against the intellectuals! They hate you, because they are unproductive! They have cold, withered eyes before which every bird is unplumed.

Such persons brag about not lying: but inability to lie is still far from being love of truth. Be on your guard!

Freedom from fever is still far from being knowledge! Icy spirits I do not believe in. He who cannot lie, does not know what truth is.

10

If you would go up high, then use your own legs! Do not get yourselves carried aloft; do not seat yourselves on other people's backs and heads! Are you mounted, however, on horseback? You now ride briskly up to your goal? Fine, my friend! But your lame foot is also with you on horseback! When you reach your goal, when you alight from your horse, precisely at your highest, you higher man, then will you stumble!

11

You creating ones, you higher men! One is only pregnant with one's own child.

Do not let yourselves be imposed upon or put upon! Who then is your neighbor? Even if you act "for your neighbor"— you still do not create for him!

Unlearn, I pray you, this "for," you creating ones: Your very virtue wishes you to have nothing to do with "for" and "on account of" and "because." Against these false little words shall you stop your ears.

"For one's neighbour," is the virtue only of the petty people: There it is said "birds of a feather," and "one hand washes the other." They have neither the right nor the power for your self-seeking!

In your self-seeking, you creating ones, there is the foresight and foreseeing of the pregnant! What no one's eye has yet seen – the fruit! – this, shelters and saves and nourishes your entire love.

Where your entire love is, namely with your child, there is also your entire virtue! Your work, your will is your "neighbour": Let no false values impose themselves upon you!

12

You creating ones, you higher men! Whoever has to give birth is sick; and whoever has given birth is unclean.

Ask women: one gives birth, not because it gives pleasure. The pain makes hens and poets cackle.

you creating ones, in you there is much uncleanliness. That is because you have had to be mothers.

A new child: Oh, how much new filth has also come into the world! Go apart! He who has given birth shall wash his soul!

13

Be not virtuous beyond your powers! And seek nothing from yourselves opposed to probability!

Walk in the footsteps in which your fathers' virtue has already walked! How will you rise high, if your fathers' will does not rise with you?

He, however, who would be a firstling, let him take care lest he also become a lastling! And where the vices of your fathers are, there should you not set yourself up as saints!

He whose fathers were inclined to women, and to strong wine and flesh of the wild boar – what would it be if he demanded chastity of himself?

A folly would it be! Rather, it seems to me, that he should be the husband of one or of two or of three women.

And if he founded monasteries, and inscribed over their portals: "The way to holiness" – I should still say: What good is it? It is a new folly!

He has founded for himself a penance-house and refuge-house: much good may it do! But I do not believe in it.

In solitude there grows what one brings into it – including the brute in one's own nature. Thus is solitude inadvisable to many.

Has there ever been anything filthier on earth than the saints of the wilderness? Around them was not only the devil loose – but also the swine.

14

Shy, ashamed, awkward, like the tiger whose spring has failed – thus, you higher men, have I often seen you slink aside. A cast which you made has failed –

But what does it matter, you dice-players! Have you not learned to play and joke, as one must play and joke? Do we not ever sit at a great table of joking and playing?

And if great things have been a failure with you, have you yourselves therefore been a failure? And if you yourselves have been a failure, has man therefore been a failure? If man, however, has been a failure – well then? Never mind!

15

The higher its type, always the less often does a thing succeed. You higher men here, have you not all been failures?

Be of good cheer; what does it matter? How much is still possible! Learn to laugh at yourselves, as you ought to laugh!

What wonder even that you have failed and only half succeeded, you half-shattered ones! Does not man's future strive and struggle within you?

Man's furthest, profoundest, star-highest issues, his prodigious powers, do not all these foam through one another in your cup?

What wonder that many a cup shatters! Learn to laugh at yourselves, as you ought to laugh! You higher men, oh, how much is still possible!

And verily, how much has already succeeded! How rich is this earth in small, good, perfect things, in well-constituted things!

Set around you small, good, perfect things, you higher men. Their golden maturity heals the heart.
The perfect teaches one to hope.

16

What has until now been the greatest sin here on earth? Was it not the word of him who said: "Woe to them that laugh now!"

Did he himself find no cause for laughter on the earth? Then he sought badly. Even a child finds cause for it.

He did not love enough: Otherwise would he also have loved us, the laughing ones! But he hated and hooted us; wailing and teeth-gnashing did he promise us.

Must one then curse immediately, when one does not love? That seems to me in bad taste. Thus did he, however, this absolute one. He sprang from the crowd.

And he himself just did not love sufficiently; otherwise would he have raged less because people did not love him. Great love does not seek love – it seeks more!

Go out of the way of all such absolute ones! They are a poor sickly type, a crowd-type: They look at this life with ill-will, they have an evil eye for this earth.

Go out of the way of all such absolute ones! They have heavy feet and sultry hearts – they do not know how to dance. How could the earth be light to such ones!

17

Sinuously do all good things approach their goal. Like cats they curve their backs, they purr inwardly with their approaching happiness – all good things laugh.

His step betrays whether a person already walks on his own path: Just see me walk! He, however, who comes close to his goal, dances.

And verily, a statue have I not become, nor yet do I stand there stiff, stupid and stony, like a pillar; I love fast racing.

And though there be on earth swamps and thick melancholy, he who has light feet runs even across the mud, and dances, as upon well-swept ice.

Lift up your hearts, my brothers, high, higher! And do not forget your legs! Lift up also your legs, you good dancers, and better still, stand upon your heads!

18

This crown of the laughter, this rose-garland crown: I myself have put on this crown, I myself have consecrated my laughter. No one else have I found today potent enough for this.

Zarathustra the dancer, Zarathustra the light one, who beckons with his wings, ready for flight, beckoning to all birds, ready and prepared – a blissfully light-spirited one:

Zarathustra the soothsayer, Zarathustra the sooth-laughter, no impatient one, no absolute one, but one who loves leaps and somersaults; I myself have put on this crown!

19

Lift up your hearts, my brothers, high, higher! And do not forget your legs! Lift up also your legs,

you good dancers, and better still if you stand upon your heads!

There are also heavy animals in a this state of happiness, there are thoroughly heavy-footed ones. Curiously do they exert themselves, like an elephant which endeavours to stand upon its head.

Better, however, to be foolish with happiness than foolish with misfortune, better to dance awkwardly than walk lamely. So learn, I pray you, my wisdom, you higher men: Even the worst thing has two good reverse sides...

...Even the worst thing has good dancing-legs: So learn, I pray you, you higher men, to put yourselves on your proper legs!

So unlearn, I pray you, the melancholy and all the crowd-sadness! Oh, how sad the buffoons of the crowd seem to me today! This today, however, is that of the crowd.

20

Be like the wind when it rushes forth from its mountain-caves: To its own piping will it dance; the seas tremble and leap under its footsteps.

That which gives wings to asses, that which milks the lionesses: Praised be that good, unruly spirit, which comes like a hurricane to all the present and to all the crowd –

That which is hostile to thistle-heads and puzzle-heads, and to all withered leaves and weeds: Praised be this wild, good, free spirit of the storm, which dances upon swamps and afflictions, as upon meadows!

That which hates the consumptive crowd-dogs, and all their ill-constituted, sullen brood: Praised be this spirit of all free spirits, the laughing storm, which blows dust into the eyes of all the dark-sighted and melancholic!

You higher men, the worst thing in you is that you have, none of you, learned to dance as you ought to dance – to dance beyond yourselves! What does it matter that you have failed?

How many things are still possible! So learn to laugh beyond yourselves! Lift up your hearts, you good dancers, high! higher! And do not forget good laughter!

This crown of laughter, this rose-garland crown: to you, my brothers, do I cast this crown! Laughing have I consecrated: You higher men, learn, I pray you – to laugh!

The Beginnings of Psychology

Psychology as we know it didn't suddenly appear on the intellectual scene. It is impossible to say just when it began, or who was responsible for it. Instead, we can only point to a number of currents that take us from philosophy and the natural sciences into something recognizably psychological. This chapter looks at two of these "primordial" currents – associationism as the beginnings of a cognitive theory, and the introduction of quantification in the forms of psychophysics and intelligence testing.

Associationism

Associationism is the theory that the mind is composed of elements – usually referred to as sensations and ideas – which are organized by means of various associations. Although the original idea can be found in Plato, it is Aristotle who gets the credit for elaborating on it. Aristotle counted four laws of association when he examined the processes of remembrance and recall:

1. **The law of contiguity.** Things or events that occur close to each other in space or time tend to get linked together in the mind. If you think of a cup, you may think of a saucer; if you think of making coffee, you may then think of drinking that coffee.
2. **The law of frequency.** The more often two things or events are linked, the more powerful will be that association. If you have an éclair with your coffee every day, and have done so for the last twenty years, the association will be strong indeed – and you will be fat.
3. **The law of similarity.** If two things are similar, the thought of one will tend to trigger the thought of the other. If you think of one twin, it is hard not to think of the other. If you recollect one birthday, you may find yourself thinking about others as well.
4. **The law of contrast.** On the other hand, seeing or recalling something may also trigger the recollection of something completely opposite. If you think of the tallest person you know, you may suddenly recall the shortest one as well. If you are thinking about birthdays, the one that was totally different from all the rest is quite likely to come up.

Association, according to Aristotle, took place in the "**common sense**." It was in the common sense that the look, the feel, the smell, the taste of an apple, for example, came together to become the idea of an apple.

For 2000 years, these four laws were assumed to hold true. St. Thomas pretty much accepted it lock, stock, and barrel. No one, however, cared that much about association. It was seen as just a simple description of a commonplace occurrence. It was seen as the activity of passive reason, whereas the abstraction of principles or essences – far more significant to philosophers – was the domain of active reason.

During the enlightenment, philosophers began to become interested in the idea again, as a part of their studies of vision as well as their interest in epistemology. **Hobbes** understood complex experiences as being associations of simple experiences, which in turn were associations of sensations. The basic means of association, according to Hobbes, was coherence (contiguity), and the basic strength factor was repetition (frequency).

John Locke, rejecting the possibility of innate ideas, made his entire system dependent on association of sensations into simple ideas. He did, however, distinguish between ideas of sensations and ideas of reflection, meaning active reason. Only by adding simple ideas of reflection to simple ideas of sensation could we derive complex ideas. He also suggested that complex emotions derived from pain and pleasure (simple ideas) associated with other ideas.

It was **David Hume** who really got into the issue. Recall that he saw all experiences as having no substantial reality behind them. So whatever coherence the world (or the self) seems to have is a matter of the simple

application of these natural laws of association. He lists three:

1. **The law of resemblance** – i.e. similarity.
2. **The law of contiguity**.
3. **The law of cause and effect** – basically contiguity in time.

David Hartley (1705-1757) was an English physician who was responsible for making the idea of associationism popular, especially in a book called *Observations of Man*. His emphasis was on the law of contiguity (in time and space) and the law of frequency. But he added an idea he got from the famous Isaac Newton: This association was a matter of tuned "**vibrations**" within the nerves! His basic ideas are very similar to those of D. O. Hebb in the twentieth century.

James Mill (1773-1836) also elaborated on Hume's associationism. The elder Mill saw the mind as passively functioning by the law of contiguity, with the law of frequency and a law of **vividness** "stamping in" the association. His emphasis on the law of frequency as the key to learning makes his approach very similar to the behaviorists in the twentieth century. But he is most famous for being the father of...

John Stuart Mill

"That so few now dare to be eccentric marks the chief danger of the time."

John Stuart Mill was born May 20, 1806 in London. His father was James Mill, an historian, philosopher, and social theorist. His mother was Harriet Barrow, and seems to have had next to no influence on him! His father decided to use the principles of utilitarianism and associationism (in consultation with his good friend, Jeremy Bentham) to educate John "scientifically."

This seemed to work quite well: John began learning Greek at three, Latin at eight. At 14, he studied French, mathematics, and chemistry in France. At 16, he began working as a clerk for his father at India House, headquarters of the East India Company. By 18, John was publishing articles on utilitarian philosophy!

But at 20, he had a nervous breakdown, which he describes in his **Autobiography** (1873). He attributed it, no doubt rightly, to his rigid education.

In 1830, he met Harriet Taylor, a married woman. He remained loyal to her until her husband died 21 years later (!), at which point they married. Sadly, she died only seven years later.

During this time, he served as an examiner for the East India Company. He also served as a liberal member of Parliament from 1865 to 1868. ("Conservatives are not necessarily stupid, but most stupid people are conservatives.") He died at his home in Avignon, France, on May 8, 1873.

His best known work is **On Liberty**, published in 1859. His most important work as far as science and psychology are concerned is **A System of Logic**, first printed in 1843 and going through many more editions through the rest of the 1800's.

He began with the basics established by Hume, his father James Mill, and others:



1. A sensory impression leaves a mental representation (idea or image);
2. If two stimuli are presented together repeatedly, they create an association in the mind;
3. The intensity of such a pairing can serve the same function as repetition.

But he adds that associations can be more than the simple sum of their parts. They can have attributes or qualities different from the parts in the same way that water has different qualities than the hydrogen and oxygen that compose it. So J. S. Mill's associationism is more like "**mental chemistry**" than mental addition.

J. S. Mill agrees with Hume that all we can know about our world and ourselves is what we experience, but notes that generalization allows us to talk with some confidence about things beyond experience. And he believed that there are real causes for consistent phenomena!

This is often called **phenomenalism**. He defines matter, for example, as "the permanent possibility of sensation." This perspective would have profound effects on 20th century logical positivism (Wittgenstein, Ayer, Schlick, Carnap, and others) who provided the philosophical foundation for most behaviorists.

He promotes a scientific method that focuses on **induction**: Generalizations from experiences lead to theory, from which we then develop alternative hypotheses; We go on to test these hypotheses by observation and experiment, the results of which allow us to improve theory, and so on. This circular notion of scientific progress is known as the **hypothetico-deductive method**. In this way we slowly build up laws of nature in which we can be increasingly confident. This method proved to be very popular among the scientists of his day.

He more specifically outlines five procedures for establishing causation. The simpler ones go like this:

1. **The method of agreement**: If a phenomenon occurs in two different situations, and those two situations have only one thing in common, that "thing" is the cause (or effect) of the phenomenon.
2. **The method of differences**: If a phenomenon occurs in one situation but not in another, and those two situations have everything in common except for one thing, then that "thing" is the cause (or effect) of the phenomenon.
3. **The method of concomitant variations**: If one phenomenon varies consistently with the variations of another phenomenon, one is the cause or effect, or is otherwise involved in the causation, of the other. This, of course, is the foundation for correlation which, although it cannot establish the direction of causality, does indicate some causal relationship.

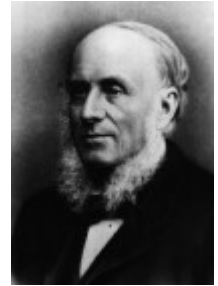
When it comes to psychology, he argued that it could indeed someday become a science, but was unlikely to ever be an exact science. Predicting the behavior of human beings may be forever beyond our abilities, leaving us to limit ourselves to talking about **tendencies**.

His **utilitarianism** recognizes that happiness is not restricted to physical pleasures (or the avoidance of pain), that there may be different kinds or qualities of happiness. "It is better to be a human being dissatisfied than a pig satisfied; better to be Socrates dissatisfied than a fool satisfied." So, although we certainly begin as simple pleasure-seeking creatures, over time we can acquire far more humanistic motivations. Ultimately, this means that high moral values can be taught, and are not dependent on innate qualities of character.

When looking at social issues, J. S. Mill applies his expanded utilitarianism: Does a certain institution add to human welfare? Or are there better alternatives? He argues, for example, that women should be allowed to vote because women's self-interests can add balance to men's self-interests, and lead to a better society. He argues for personal freedom because it allows creative individuals to better contribute to society. On the other hand, he notes that free-market capitalism tends to result in inequity and poverty, and we would be better served by some form of socialism.

Thomas Brown (1778-1820) of the Scottish School puts the finishing touches to associationism: His laws of suggestion (i.e. association) were resemblance, contrast, and nearness in space and time, just like Aristotle's. He added a set of secondary laws – duration, liveliness, frequency, and recency – that strengthened suggestions. Then he considered as well the degrees of coexistence with other associations, constitutional differences of mind or temperament, differing circumstances of the moment, state of health or efficiency of the body, and prior habits. Finally, he understood association as an active process of an active, holistic mind.

Alexander Bain (1818-1903), a lifelong friend of John Stuart Mill, connected associationism with physiology. Accepting the law of contiguity, similarity, and frequency, he viewed them, as had Hartley, as neurological. He added the law of compound association, which says that most associations are among whole clusters of other associations. And he added the law of constructive association, which says that we can also actively, creatively, add to our associations ourselves.



One of Bain's basic principles is immortalized as the **Spencer-Bain principle**: The frequency or probability of a behavior rises if it is followed by a pleasurable event, and decreases if it is followed by a painful event. This is, of course, the same principle that the behaviorists would elaborate on a century later.

Bain has an even larger role in the history of psychology. First, he is often given the credit of having written two of the earliest textbooks in psychology – **The Senses and the Intellect** (1855) and **Emotions and the Will** (1859), both of which went through many editions, and were used, for example, by William James. He also founded the first English-language psychological journal, called **Mind**, in January of 1876.

Hermann Ebbinghaus

The preceding people were essentially philosophers, not scientists. The first psychologist who made an effort to study association scientifically was Hermann Ebbinghaus.

Hermann Ebbinghaus was born on January 23, 1850, in Barmen, Germany. His father was a wealthy merchant, who encouraged his son to study. Hermann attended the University of Halle and the University of Berlin, and received his doctorate from the University of Bonn in 1873. While traveling through Europe, he came across a copy of Fechner's *Elements of Psychophysics*, which turned him on to psychology.



Ebbinghaus worked on his research at home in Berlin and published a book called **On Memory: An Investigation in Experimental Psychology** in 1885. Basically, his research involved the memorization of **nonsense syllables**, which consisted of a consonant, a vowel, and another consonant. He would select a dozen words, then attempt to master the list. He recorded the number of trials it took, as well as the effects of variations such as relearning old material, or the **meaningfulness** of the syllables. The results have been confirmed and are still valid today.

He also wrote the first article on intelligence testing of school children, and devised a sentence completion test that became a part of the Binet-Simon test. He also published textbooks on psychology in 1897 and 1902 that were very popular for many years. Hermann Ebbinghaus died in 1909, a clear precursor to today's cognitive movement.

The laws of association would continue to have a powerful influence in psychology. The Behaviorists, of course, focused on stimulus-stimulus and stimulus-response associations. The Gestalt psychologists

elaborated on the various associations they termed the laws of Prägnanz. Among the cognitive psychologists, there are various theories of semantic association. And the physiological psychologists talk about the neurological bases for association. The idea appears to be here to stay. But then, as Greek and Medieval philosophers knew, association is just a simple description of a commonplace occurrence!

Psychophysics

Again and again, philosophers stated unequivocally that psychology could never be a science. The activities and the contents of the mind could not be measured, and therefore an objectivity such as that achieved in physics and chemistry was out of reach. Psychology would forever remain subjective!

This would finally change in the early 1800s. **Ernst Weber** (1795 to 1878) was born June 24 in Wittenburg, Germany, the third of 13 children! He received his doctorate from the University of Leipzig in 1815, in physiology. He began teaching there right after graduation, and continued until he retired in 1871.

His research was predominantly concerned with the senses of touch and kinesthesia (the experience of muscle position and movement). He was the first to clearly demonstrate the existence of kinesthesia, and showed that touch was actually a conglomerate sense composed of senses for pressure, temperature, and pain.

His chosen interests led him to certain techniques: First, there is the **two-point threshold**, which is a matter of measuring the smallest distance noticeable to touch at various parts of the body. For example, the tongue had the smallest threshold (1 mm), and the back had the largest (60 mm).

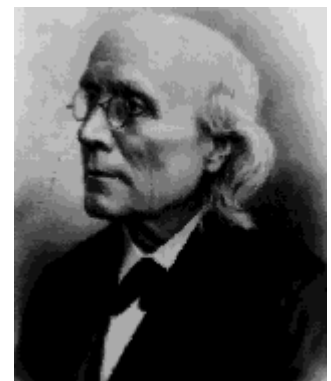
A second technique involved kinesthesia: **Just-noticeable difference** is the smallest difference in weight a person is capable of perceiving through holding two things. He discovered that the just-noticeable difference was a constant fraction of the weights involved. If you are holding a 40 pound weight in one hand, you will be able to recognize that a 41 pound weight in the other hand is in fact different. But if it were a 20 pound weight, you could detect that a mere half pound difference! In other words, as regards weight, we could recognize a 1/40 difference, whatever the weights.

This is known as **Weber's Law**, and is the first such "law" relating a physical stimulus with a mental experience.

Gustav Fechner

Gustav Fechner was born April 1, 1801. His father, a village pastor, died early in Gustav's childhood, so he, with his mother and brother, went to live with their uncle. In 1817, at the age of 16, he went off to study medicine at the University of Leipzig (where Weber was teaching). He received his MD degree in 1822 at the age of 21.

But his interests moved to physics and math, so he made his living tutoring, translating, and occasionally lecturing. After writing a significant paper on electricity in 1831, he was invited to become a professor of physics at Leipzig. There, he became friends with a number of people, including Wilhelm Wundt,



and his interests moved again, this time to psychology, especially vision.

In 1840, he had a nervous breakdown, and he had to resign his position due to severe depression. At his worst, he stayed in his rooms alone, avoiding light which hurt his eyes, and even painted his room black. While lying in bed one morning, October 22, 1850, he suddenly realized that it was indeed possible to connect the measurable physical world with the mental world, supposed to be inaccessible to scientific investigation! As his condition improved, he returned to writing and performing endless experiments, using mostly himself as a subject.

Like many people at the time, he found Spinoza's double-aspectism convincing and found in panpsychism something akin to a personal religion. Using the pseudonym **Dr. Mises**, he wrote a number of satires about the medicine and philosophy of his day. But he also used it to communicate, often in an amusing way, his spiritual perspective. As a panpsychist, he believed that all of nature was alive and capable of awareness of one degree or another. Even the planet earth itself, he believed, had a soul. He called this the **day-view**, and opposed it to the **night-view** of materialism.

Further, he felt that our lives come in three stages – the fetal life, the ordinary life, and the life after death. When we die, our souls join with other souls as part of the supreme soul.

It was double-aspectism that led him to study (and name) **psychophysics**, which he defined as the study of the systematic relationships between physical events and mental events. In 1860, he topped his career by publishing the **Elements of Psychophysics**.

In this book, he introduced a mathematical expression of **Weber's Law**. The expression looked like this...

$$*\Delta R / R = k$$

which means that the proportion of the minimum change in stimulus detectable ($*\Delta R$) to the strength of the stimulus (R) is a constant (k). (R is for the German Reiz, meaning stimulus.) Or...

$$S = k \log R$$

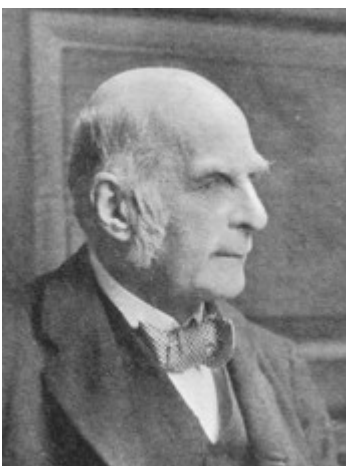
where S is the experienced sensation.

Fechner died November 28, 1887.

What Weber and Fechner showed that makes them far more significant than just Weber's Law is that psychological events are in fact tied to measurable physical events in a systematic way, which everyone had thought impossible. Psychology could be a science after all!

The second quantitative breakthrough would be the measurement of something far more complex, far more "psychological:" **intelligence**. We owe this to two great minds in particular: Sir Francis Galton in England and Alfred Binet in France.

Sir Francis Galton



Francis Galton was born February 16, 1822 near Birmingham, England. He was the youngest of 7 children, and first cousin of Charles Darwin. His father, a wealthy banker, insisted on educating Francis at home, especially considering that Francis could read at 2 and a half years old!

Later in childhood, he was sent off to boarding school, which he despised and criticized even in adulthood. At 16, he went to medical school at King's College at Oxford. He finished his degree at Cambridge in 1843, at 21.

His father died, leaving Galton a wealthy young aristocrat. He traveled extensively and became a member of the Royal Geographical Society, for

which he developed maps of new territories and accounts of his adventures. He became president of that organization in 1856.

Galton had a penchant for measuring everything – extending even to the behinds of women he encountered in his travels in Africa (something he had to do from a distance, of course, by means of triangulation). This interest in measurement led to his invention of the weathermap (including highs, lows, and front – terms he introduced), and to suggesting the use of fingerprints to Scotland Yard.

His obsession eventually led to his efforts at measuring intelligence. In 1869, he published **Hereditary Genius: An Inquiry into its Laws and Consequences**, in which he demonstrates that the children of geniuses tend to be geniuses themselves.

In 1874, he produced **English Men of Science: Their Nature and Nurture**, based on long surveys passed out to thousands of established scientists. In this volume, he noted that, although the potential for high intelligence is still clearly inherited, that it also needed to be nurtured to come to full fruition. In particular, the broad, liberal education provided by the Scottish school system proved far superior to the English school system he hated so much.

In 1883, he wrote **Inquiries into Human Faculty and its Development**. This would be the first time anyone compared identical and fraternal twins, a method now considered ideal when investigating nature vs nurture issues.

In 1888, he published **Co-Relations and Their Measurement, Chiefly from Anthropometric Data**. As the title suggests, it was Galton who invented correlation, as well as scatter plots and regression toward the mean. Later, Karl Pearson (1857-1936) would discover the mathematical formulation of correlation.

Sir Francis died in 1911, after an incredibly productive, if somewhat eccentric, life.

Alfred Binet

Born July 11, 1851 in Nice, France, Alfred was an only child. His mother, an artist, raised him by herself after a divorce from his father, a physician.

He started studying medicine, but decided to study psychology on his own – being independently wealthy left him free to do what he pleased! He worked with the psychiatrist Charcot at La Salpêtrière, where he studied hypnosis.

In 1891, he moved to Paris to study at the physiological-psychology lab at the Sorbonne, where he developed a variety of research interests, especially, of course, involving individual differences. In 1899, he and his graduate student, **Theodore Simon** (1873-1961) were commissioned by the French government to study retardation in the French schools, and to create a test to differentiate normal from retarded children.

After marriage, he began studying his own two daughters and testing them with Piaget-like tasks and other tests. This led to the publication of *The Experimental Study of Intelligence* in 1903.

In 1905, Binet and Simon came out with the **Binet-Simon Scale of Intelligence**, the first test permitting graduated, direct testing of intelligence. They expanded the test to normal children in 1908, and to adults in 1911.

Binet believed intelligence to be complex, with many factors, and not to be a simple, single entity. He didn't like the use of a single number as developed by **William Stern** in 1911 – the intelligence quotient or IQ. He also believed that, though genetics may set upper limits on intelligence, most of us have plenty of room for



improvement with the right kind of education.

He cautioned that his tests should be used with restraint: Even a child two years behind his age level may later prove to be brighter than most! He was afraid that IQ would prejudice teachers and parents, and that people would tend to view it as fixed and prematurely give up on kids who score low early on.

He suggested something he called **mental orthopedics**: Exercises in attention and thought that could help disadvantaged children "learn how to learn." He died in 1911, a man way ahead of his time, and wiser than most!

Binet's fears were well founded. For example, **Charles Spearman** (1863-1945) introduced the idea that "general intelligence" (g) was real, unitary, and inherited.

Worse were the antics of **Henry Goddard** (1866-1957). He translated the Binet Simon test into English. He studied a family in New Jersey he named the Kallikaks. Some were normal, but quite a few were "feble-minded" (Goddard's term). He traced their genealogy to support the heredity position. Because he believed that there was a close connection between feble-mindedness and criminality, he recommended that states institute programs of sterilization of the feble-minded. 20 states passed such laws.

Goddard also tested immigrants, at the request of the Immigration Service. His testers found 40 to 50% of immigrants feble-minded, and they were immediately deported. He also cited particular countries as being more feble-minded than others! Keep in mind that these immigrants rarely spoke much English and were tested during the grueling process of passing through the bureaucracy of Ellis Island after a long ocean voyage in miserable conditions!

Eugenics – a term coined by Galton – is the policy of intentionally breeding human beings according to some standard, and the sterilization of those that do not meet those standards. It became an institutionalized reality in 1907, when the Indiana legislature passed a law that made sterilization of "defectives" possible. A federal Eugenics Record Office was established in Cold Spring Harbor, and their lawyers designed law in 1914 that was promoted as models for the entire country.

Virginia adopted such a law in 1924. Emma Buck, her daughter Carrie and infant granddaughter Vivian, were judged to be feble-minded, and their case (Buck vs Bell) was taken before the Supreme Court. The Supreme Court, under Oliver Wendell Holmes, came down in support of the sterilization laws. Holmes stated:

"It is better for all the world, if instead of waiting to execute degenerate offspring for crime, or to let them starve for their imbecility, society can prevent those who are manifestly unfit from continuing their kind. The principle that sustains compulsory vaccination is broad enough to cover cutting the Fallopian tubes. Three generations of imbeciles are enough."

Although scientists disputed the reasoning behind the sterilization laws, 33 states adopted them, and some 65,000 American citizens were sterilized. The Nazis based their eugenics laws on the American ones and sterilized 350,000. Eugenics gradually became unpopular as the horrors of Nazi Germany became public, and gradually ended in the 1940's. The Supreme Court has yet to reverse its opinion on the matter, however.

People reading about eugenics and the sterilization laws often think that this is a great example of how immoral scientists can be. In reality, the laws were based on biblical passages which say that "like comes from like," the very same passages used today by creationists.

Selection from: Hereditary Talend And Character by Francis Galton (1865)*

The power of man over animal life, in producing whatever varieties of form he pleases, is enormously great. It would seem as though the physical structure of future generations was almost as plastic as clay, under the control of the breeder's will. It is my desire to show more pointedly than – so far as I am aware – has been attempted before, that mental qualities are equally under control.

....

So far as I am aware, no animals have ever been bred for general intelligence. Special aptitudes are thoroughly controlled by the breeder. He breeds dogs that point, that retrieve, that fondle, or that bite; but, no one has ever yet attempted to breed for high general intellect, irrespective of all other qualities. It would be a most interesting subject for an attempt. We hear constantly of prodigies of dogs, whose very intelligence makes them of little value as slaves. When they are wanted, they are apt to be absent on their own errands. They are too critical of their master's conduct. For instance, an intelligent dog shows marked contempt for an unsuccessful sportsman. He will follow nobody along a road that leads on a well-known tedious errand. He does not readily forgive a man who wounds his self-esteem. He is often a dexterous thief and a sad hypocrite. For these reasons an over-intelligent dog is not an object of particular desire, and therefore, I suppose, no one has ever thought of encouraging a breed of wise dogs. But it would be a most interesting occupation for a country philosopher to pick up, the cleverest dogs he could hear of, and mate them together, generation after generation – breeding purely for intellectual power, and disregarding shape, size, and every other quality.

....

[How to breed a better man: Find him a better woman!]

As we cannot doubt that the transmission of talent is as much through the side of the mother as through that of the father, how vastly would the offspring be improved, supposing distinguished women to be commonly married to distinguished men, generation after generation, their qualities being in harmony and not in contrast, according to rules of which we are now ignorant, but which a study of the subject would be sure to evolve!

It has been said by Bacon that "great men have no continuance." I, however, find that very great men are certainly not averse to the other sex, for some such have been noted for their illicit intercourses, and, I believe, for a corresponding amount of illegitimate issue. Great lawyers are especially to be blamed in this, even more than poets, artists, or great commanders. It seems natural to believe that a person who is not married, or who, if married, does not happen to have children, should feel himself more vacant to the attractions of a public or a literary career than if he had the domestic cares and interests of a family to attend to. Thus, if we take a list of the leaders in science of the present day, the small number of them who have families is very remarkable. Perhaps the best selection of names we can make, is from those who have filled the annual scientific office of President of the British Association. We will take the list of the commoners simply, lest it should be objected, though unjustly, that some of the noblemen who have occupied the chair were not wholly indebted to their scientific attainments for that high position. Out of twenty-two individuals, about one-third have children; one-third are or have been married and have no children; and one-third have never been married. Among the children of those who have had families, the names of Frank Buckland and Alexander Herschel are already well-known to the public.

There has been a popular belief that men of great intellectual eminence, are usually of feeble constitution, and of a dry and cold disposition. There may be such instances, but I believe the general rule to be exactly

* Originally published in Macmillan's Magazine, 12, 157-166, 318-327.

Classics in the History of Psychology. An internet resource developed by Christopher D. Green
York University, Toronto, Ontario

the opposite. Such men, so far as my observation and reading extend, are usually more manly and genial than the average, and by the aid of these very qualities, they obtain a recognised ascendancy. It is a great and common mistake to suppose that high intellectual powers are commonly associated with puny frames and small physical strength. Men of remarkable eminence are almost always men of vast powers of work. Those among them that have fallen into sedentary ways will frequently astonish their friends by their physical feats, when they happen to be in the mood of a vacation ramble. The Alpine Club contains a remarkable number of men of fair literary and scientific distinction; and these are among the strongest and most daring of the climbers. I believe, from my own recollections of the thews and energies of my contemporaries and friends of many years at Cambridge, that the first half-dozen class-men in classics or mathematics would have beaten, out of all proportion, the last half-dozen class-men in any trial of physical strength or endurance. Most notabilities have been great eaters and excellent digesters, on literally the same principle that the furnace which can raise more steam than is usual for one of its size burn more freely and well than is common. Most great men are vigorous animals, with exuberant powers, and an extreme devotion to a cause. There is no reason to suppose that, in breeding for the highest order of intellect, we should produce a sterile or a feeble race.

Many forms of civilization have been peculiarly unfavourable to the hereditary transmission of rare talent. None of them mere more prejudicial to it than that of the Middle Ages, where almost every youth of genius was attracted into the Church, and enrolled in the ranks of a celibate clergy.

Another great hindrance to it is a costly tone of society, like that of our own, where it becomes a folly for a rising man to encumber himself with domestic expenses, which custom exacts, and which are larger than his resources are able to meet. Here also genius is celibate, at least during the best period of manhood.

A spirit of caste is also bad, which compels a man of genius to select his wife from a narrow neighborhood or from the members of a few families.

But a spirit of clique is not bad. I understand that in Germany it is very much the custom for professors to marry the daughters of other professors, and I have some reason to believe, but am anxious for further information before I can feel sure of it, that the enormous intellectual digestion of German literary men, which far exceeds that of the corresponding class of our own country-men, may, in some considerable degree, be traceable to this practice.

So far as beauty is concerned, the custom of many countries, of the nobility purchasing the handsomest girls they could find for their wives, has laid the foundation of a higher type of features among the ruling classes. It is not so very long ago in England that it was thought quite natural that the strongest lance at the tournament should win the fairest or the noblest lady. The lady was the prize to be tilted for. She rarely objected to the arrangement, because her vanity was gratified by the *éclat* of the proceeding. Now history is justly charged with a tendency to repeat itself. We may, therefore, reasonably look forward to the possibility, I do not venture to say the probability, of a recurrence of some such practice of competition. What an extraordinary effect might be produced on our race, if its object was to unite in marriage those who possessed the finest and most suitable natures, mental moral, and physical!

Let us, then, give reins to our fancy, and imagine a Utopia – or a Laputa, if you will – in which a system of competitive examination for girls, as well as for youths, had been so developed as to embrace every important quality of mind and body, and where a considerable sum was yearly allotted to the endowment of such marriages as promised to yield children who would grow into eminent servants of the State. We may picture to ourselves an annual ceremony in that Utopia or Laputa, in which the Senior Trustee of the Endowment Fund would address ten deeply-blushing young men, all of twenty-five years old, in the following terms:

"Gentlemen, I have to announce the results of a public examination, conducted on established principles; which show that you occupy the foremost places in your year, in respect to those qualities of talent, character, and bodily vigour which are proved, on the whole, to do most honour and best service to our race. An examination has also been conducted on established principles among all the young ladies of this country who are now of the age of twenty-one, and I need hardly remind you, that this examination takes note of

grace, beauty, health, good temper, accomplished housewifery, and disengaged affections, in addition to noble qualities of heart and brain. By a careful investigation of the marks you have severally obtained, and a comparison of them, always on established principles, with those obtained by the most distinguished among the young ladies, we have been enabled to select ten of their names with especial reference to your individual qualities. It appears that marriages between you and these ten ladies, according to the list I hold in my hand, would offer the probability of unusual happiness to yourselves, and, what is of paramount interest to the State, would probably result in an extraordinarily talented issue. Under these circumstances, if any or all of these marriages should be agreed upon, the sovereign herself will give away the brides, at a high and solemn festival, six months hence, in Westminster abbey. We, on our part, are prepared, in each case, to assign 5,000£ as a wedding-present, and to defray the cost of maintaining and educating your children, out of the ample funds entrusted to our disposal by the State."

If a twentieth part of the cost and pains were spent in measures for the improvement of the human race that is spent on the improvement of the breed of horses and cattle, what a galaxy of genius might we not create! We might introduce prophets and high priests of our civilization into a world as surely as we can propagate idiots by mating crétins. Men and women of the present day are, to those we might hope to bring into existence, what the pariah dogs of the streets of an Eastern town are to our own highly bred varieties.

The feeble nations of the world are necessarily giving way before the nobler varieties of mankind; and even the best of these, so far as we know them, seem unequal to their work. The average culture of mankind is become so much high, than it was, and the branches of knowledge and history so various and extended, that few are capable even of comprehending the exigencies of our modern civilization; much less fulfilling them. We are living in a sort of intellectual anarchy, for want of master minds. The general intellectual capacity of our leaders requires to be raised, and also to be differentiated. We want abler commanders, statesmen, thinkers, inventors, and artists. The natural qualifications of our race are no greater than they used to be in semi-barbarous times, though the conditions amid which we are born are vastly more complex than of old. The foremost minds of the present day seem to stagger and halt under an intellectual load too heavy for their powers.

[On Americans]

Let us consider an instance in which different social influences have modified the inborn dispositions of a nation. The North American people has been bred from the most restless and combative class of Europe. Whenever, during the last ten or twelve generations, a political or religious party has suffered defeat, its prominent members, whether they were the best, or only the noisiest, have been apt to emigrate to America, as a refuge from persecution. Men fled to America for conscience' sake, and for that of unappreciated patriotism. Every scheming knave, and every brutal ruffian, who feared the arm of the law, also turned his eyes in the same direction. Peasants and artisans, whose spirit rebelled against the tyranny of society and the monotony of their daily life, and men of a higher position, who chafed under conventional restraints, all yearned towards America. Thus the dispositions of the parents of the American people have been exceedingly varied, and usually extreme, either for good or for evil. But in one respect they almost universally agreed. Every head of an emigrant family brought with him a restless character, and a spirit apt to rebel. If we estimate the moral nature of Americans from their present social state, we shall find it to be just what we might have expected from such a parentage. They are enterprising, defiant, and touchy; impatient of authority; furious politicians; very tolerant of fraud and violence; possessing much high and generous spirit, and some true religious feeling, but strongly addicted to cant.

[As is mildly suggested by the preceding passage, Galton's discussions of the character of other "races" would no doubt offend the modern sensibilities!]

The History of Statistics

- 1654 – Pascal – mathematics of probability, in correspondence with Fermat
- 1662 – William Petty and John Graunt – first demographic studies
- 1713 – Jakob Bernoulli – *Ars Conjectandi*
- 1733 – DeMoivre – *Approximatio*; law of error (similar to standard deviation)
- 1763 – Rev. Bayes – An essay towards solving a problem in the *Doctrine of Chances*, foundation for "Bayesian statistics"
- 1805 – A-M Legendre – least square method
- 1809 – C. F. Gauss – *Theoria Motus Corporum Coelestium*
- 1812 – P. S. Laplace – *Théorie analytique des probabilités*
- 1834 – *Statistical Society of London* established
- 1853 – Adolphe Quetelet – organized first international statistics conference; applied statistics to biology; described the bell-shaped curve
- 1877 – F. Galton – regression to the mean
- 1888 – F. Galton – correlation
- 1889 – F. Galton – *Natural Inheritance*
- 1900 – Karl Pearson – chi square; applied correlation to natural selection
- 1904 – Spearman – rank (non-parametric) correlation coefficient
- 1908 – "Student" (W. S. Gossett) – The probable error of the mean; the t-test
- 1919 – R. A. Fisher – ANOVA; evolutionary biology
- 1930's – Jerzy Neyman and Egon Pearson (son of Karl Pearson) – type II errors, power of a test, confidence intervals

Wilhelm Wundt and William James

Wilhelm Wundt and William James are usually thought of as the fathers of psychology, as well as the founders of psychology's first two great "schools." Although they were very different men, there are some parallels: Their lives overlap, for example, with Wilhelm Wundt born in 1832 and dying in 1920, while William James was born ten years later and died ten years earlier. Both have claims to having established the first psychology lab in 1875. And neither named his school. As you will see, there are other commonalities as well, personal and philosophical.

I believe we haven't seen thinkers of their stature in psychology since.*

Wilhelm Wundt

Wilhelm Wundt was born in the village of Neckerau in Baden, Germany on August 16, 1832. The son of a Lutheran pastor, he was a solitary and studious boy. He roomed with and was tutored by his father's assistant, the vicar of the church. He was sent off to boarding school at 13, and the university at 19.



He studied medicine at Tübingen, Heidelberg, and Berlin, although interested more in the scientific aspect than in a medical career. In 1857, he was appointed dozent (instructor) at Heidelberg, where he lectured on physiology. From 1858 to 1864, he also served as an assistant to the famous physiologist Helmholtz, and studied the neurological and chemical stimulation of muscles.

In 1864, he became an assistant professor at Heidelberg. Three years later, he started a course he called physiological psychology, which focused on the border between physiology and psychology, i.e. the senses and reactions – an interest inspired by the work of Weber and Fechner. His lecture notes would eventually become his major

work, the **Principles of Physiological Psychology (Grundzüge der physiologischen Psychologie)**, which would be published in 1873 and 1874.

Like Fechner and many others at the time, Wundt accepted the Spinozan idea of psychophysical parallelism: Every physical event has a mental counterpart, and every mental event has a physical counterpart. And he believed, like Fechner, that the availability of measurable stimuli (and reactions) could make psychological events open to something like experimental methodology in a way earlier philosophers such as Kant thought impossible.

The method that Wundt developed is a sort of experimental introspection: The researcher was to carefully observe some simple event – one that could be measured as to quality, intensity, or duration – and record his responses to variations of those events. (Note that in German philosophy at that time, sensations were considered psychological events, and therefore "internal" to the mind, even though the sensation is of something that is "outside" the mind. Hence what we might call observation was called by Wundt

*Sources:

Blumenthal, Arthur L. (2001) A Wundt Primer: The Operating Characteristics of Consciousness. Chapter Four in Reiber, Robert W. and Robinson, David K. **Wilhelm Wundt in History: The Making of a Scientific Psychology**. Kluwer Academic Publishing.

William James (1890). **The Principles of Psychology**. As presented in **Classics in the History of Psychology**, an internet resource developed by Christopher D. Green of York University, Toronto, Ontario. Available at <http://psychclassics.yorku.ca/James/Principles/prin4.htm>

Calkins, Mary W. Autobiography of Mary Whiton Calkins, in Murchison, Carl. (Ed.) (1930). **History of Psychology in Autobiography** (Vol. 1, pp. 31-61). Worcester, MA: Clark University Press. [quoting James, **Principles of Psychology**, Vol. I, pp. 225 ff.]

introspection!)

To continue his story, Wundt went on to become chair of "inductive philosophy" at Zürich in 1874, and then professor of philosophy at Leipzig in 1875. It was there that he would stay and work for the next 45 years!

In 1875, a room was set aside for Wundt for demonstrations in what we now call sensation and perception. This is the same year that William James would set up a similar lab at Harvard. We can celebrate that year as the founding of experimental psychology!

In 1879, Wundt assisted his first graduate student at true psychological research – another milestone. In 1881, he started the journal **Philosophische Studien**. In 1883, he began the first course to be titled experimental psychology. And in 1894, his efforts were rewarded with the official establishment of an "Institute for Experimental Psychology" at Leipzig – the first such in the world.

Wundt was known to everyone as a quiet, hard-working, and very methodical researcher, as well as a very good lecturer. The latter comment is from the standards of the day, which were considerably different from today's: He would go on in a low voice for a couple of hours at a time, without notes or audio-visual aides and without pausing for questions. His students loved him, but we would no doubt criticize him for not being sufficiently entertaining!

It is curious to note that during this same busy time period, Wundt also published four books in philosophy! Keep in mind that, at this time, psychology was not considered something separate from philosophy. In fact, Wundt rejected the idea when someone suggested it to him!

The studies conducted by Wundt and his now numerous students were mostly on sensation and perception, and of those, most concerned vision. In addition, there were studies on reaction time, attention, feelings, and associations. In all, he supervised 186 doctoral dissertations, most in psychology.

Among his better known students were Oswald Külpe and Hugo Munsterberg (whom James invited to teach at Harvard), the Russian behaviorists Bekhterev and Pavlov, as well as American students such as Hall ("father" of developmental psychology in America), James McKeen Cattell, Lightner Witmer (founder of the first psychological clinic in the US, at U of Penn), and Wundt's main interpreter to the English speaking world, E. B. Titchener. Titchener is particularly responsible for interpreting Wundt badly!

Later in his career, Wundt became interested in social or cultural psychology. Contrary to what many believe, Wundt did not think that the experimental study of sensations was the be all and end all of psychology! In fact, he felt that that was only the surface, and additionally that most of psychology was not as amenable to experimental methods.

Instead, he felt that we had to approach cultural psychology through the products it produced – mythology, for example, cultural practices and rituals, literature and art.... He wrote a ten volume **Völkerpsychologie**, published between 1900 and 1920, which included the idea of stages of cultural development, from the primitive, to the totemic, through the age of heroes and gods, to the age of modern man.

In 1920, he wrote **Erlebtes and Erkanntes**, his autobiography. A short time later, on August 31, 1920, he died.

William James



William James was born in New York City on January 11, 1842. His father was a rich man who spent his time entertaining the intellectuals of the time and discussing the religious mysticism of Swedenborg. This wonderful atmosphere for a bright young boy was thanks to his grandfather, an Irish immigrant with a knack for real estate investment! William was soon joined by a younger brother, Henry, who would grow up to be one of America's premier novelists. All the James children were sent to European boarding schools and traveled through all the great capitals.

At 19, after a stint as an art student, James enrolled at Harvard in chemistry, which he soon changed to medicine. He was not really interested in a career in medicine, but wanted to study the science that went with it.

In 1865, he took advantage of a marvelous opportunity to travel the Amazon River basin with the great biologist Louis Agassiz, to collect samples of new species. While there, he began to suffer from a variety of health problems. In 1867, he went to study physiology in Germany, under Helmholtz and others. He befriended several notable early German psychologists, including Carl Stumpf. On the other hand, he had little respect for Herbert Spencer, Wilhelm Wundt, G. E. Müller, and others.

In Germany, he began to suffer from serious depression, accompanied by thoughts of suicide. In addition, he had serious back pain, insomnia, and dyspepsia. In 1869, he came back to the US to finish up his MD degree, but continued to be plagued by depression. He had been reading a book by a French philosopher named Renouvier, which convinced him of the power of free will. He decided to apply this idea to his own problems, and seemed to improve.

(A personal aside: I also suffer from depression. Unlike James, however, I began to get a grip on my depression when I finally realized that it was biological, and therefore precisely not in my control!)

From 1871 through 1872, James was a part of "the Metaphysical Club," a group of Harvard grads who met in Boston to discuss the issues of the day. Included in the club were the philosopher Charles Peirce, Oliver Wendell Holmes, and Chauncey Wright. It was Wright who introduced the idea of combining Alexander Bain's concept of beliefs as the disposition to behave, with Darwin's concept of survival of the fittest: Ideas had to compete with each other, and the best would last. This is similar to a more recent idea called memes.

It was Peirce, on the other hand, who took Kant's idea that we can never really know the truth – that all our beliefs are maybes – and turned it into the basis for pragmatism. This is very similar to Hans Vaihinger's (1852-1933) philosophy of "as if" that so influenced Alfred Adler and George Kelly.

In 1872, James was appointed an instructor of physiology at Harvard. In 1875, he taught his first course in psychology, or "physiological psychology," ala Wundt, and established a demonstration laboratory – the same year Wundt established his at Leipzig. and in 1876, he became an assistant professor of physiology.

In 1878, he married Alice Gibbons, a Boston school teacher. She took particularly good care of him, and his depression lessened significantly. Despite his tender nature, he and Alice managed to raise five children.

In that same year, he signed on with the publisher Holt to write a psychology textbook. It was supposed to take two years – it took him 12.

In 1880, his title was changed to assistant professor of philosopher, which is where, in those days, psychology actually belonged. In 1885, he became a full professor.

Despite his battles with depression, he was well liked by his students and known for his great sense of humor. Even his textbook would have a certain lightness that we rarely find in textbooks. He seemed to enjoy teaching. On the other hand, he disliked research, did almost none of it, and said that labs were basically a waste of resources!

In 1889, his title changed again – to professor of psychology! The next year, his book was finally published – two volumes, to be exact, titled **The Principles of Psychology**. In 1892, he put out a shorter version subtitled **The Briefer Course**, which students would refer to for the next 50 years as "the Jimmy." Both are masterpieces of prose and were extremely popular among students of psychology and laypersons alike.

Despite his dislike of research, he did raise the money for a new and expanded lab at Harvard, but promptly arranged to hire one of Wundt's students, Hugo Münsterberg, to be its director. He did not supervise many graduate students, but several were quite successful in their own right, including James Angell, Edward Thorndike, and Mary Calkins.

[Mary Calkins (1863-1930) was the first woman to complete the requirements for a PhD in psychology at Harvard. Unfortunately, she was denied the degree because (get ready...) she was a woman. She later became the first woman president of the APA.]

James had always shared his father's interest in mysticism, even in psychic phenomena. This has dampened his reputation among hard-core scientists in the psychological community, but it only endeared him more to the public. In 1897, he published **The Will to Believe**, and in 1902, **Varieties of Religious Experience**.

But James was never completely comfortable with being a psychologist, and preferred to think of himself as a philosopher. He is, in fact, considered America's greatest philosopher, in addition to being the "father" of American psychology!

He was profoundly influenced by an earlier American philosopher, Charles Sanders Peirce, who founded the philosophy of Pragmatism. Pragmatism says that ideas can never be completely proven true or false. Rather, we should be looking to how useful an idea is – how practical, how productive. James called it the "cash value" of an idea! James popularized Pragmatism in books like **Pragmatism** in 1907 and **The Meaning of Truth** in 1909. In 1909, he also wrote **A Pluralistic Universe**, which was part Pragmatism and part an expression of his own beliefs in something not unlike Spinoza's pantheism.

He had retired from teaching in 1907 because his heart was not what it used to be, not since a mild attack in 1898 when climbing in upstate New York. He did meet Freud when he came to visit Boston in 1909, and was very much impressed. The next year, he went to Europe for his health and to visit his brother Henry, but soon returned to his home in New Hampshire. Two days later, on August 26, 1910, he died in his wife Alice's arms.

Several of his works were published posthumously, including **Some Problems in Philosophy** in 1911 and the magnificent **Essays in Radical Empiricism** in 1912. James' most famous students included John Dewey, the philosopher often considered the father of modern American education, and Edward Thorndike, whose work with cats opened the door to the Behaviorists.

Structuralism or Voluntarism

Wundt is undergoing a resurgence in popularity. Over 100 years after his work, we have finally caught up with him. Actually, he was massively misrepresented by poorly educated American students in Germany, and especially a rather ego-driven Englishman named Titchener. Wundt recognized that Titchener was misrepresenting him, and tried to make people aware of the problem. But Boring – the premier American historian of psychology for many decades – only knew Wundt through Titchener.

One misunderstanding revolves the title of one major work: **Physiological psychology**. But physiological psychology originally meant *experimental* psychology – using *methods* of physiology – although not the experimental psychology of the behaviorists in the twentieth century.

Wundt and his students used an experimental version of introspection – the careful observation of one's perceptions – and outlined some pretty specific details to the method:

1. The observer must know when the experience begins and ends.
2. The observer must maintain "strained attention."
3. The phenomenon must bear repetition.
4. And the phenomenon must be capable of variation – i.e. experimentation.

Regarding sensations, for example, it was determined that there are seven "qualities" of sensations: The visual, auditory, olfactory, gustatory, cutaneous, kinesthetic, and organic. Several of these have additional aspects. Vision, for example, has hue, saturation, and value. And qualities could vary in intensity, duration, vividness, and (for the visual and cutaneous senses) extension.

Wundt's labs were enormously productive places, describing things like selective attention, short-term memory, etc. – even including the famous limitations on short-term memory to 7 or so "pieces" of information that would not be noticed again until the 1970's.

Consciousness

One of the things that would make Wundt's work so foreign to American psychologists was what he referred to as the **principle of actuality**: He said that consciousness is, in fact, a reality, and that it is the subject matter of psychology. This is, of course, true – although we managed to overlook it for a good 80 years or so when behaviorism ruled the academic world in the the US, Britain, and Russia.

Mental processes are an *activity* of the brain, and not material. Wundt accepted Spinoza's metaphysics of parallelism and spent a great deal of effort refuting reductionism. He believed that consciousness and its activities simply did not fit the paradigms of physical science – even though psychology emerges from biology, chemistry, and physics. With that emergence, consciousness has gained a certain capacity for **creative synthesis** – another of Wundt's key concepts.

Although consciousness operates "in" and "through" the physical brain, its activities cannot be described in terms of chemistry or physics. The color blue, the sound of an E minor chord, the taste of smoked salmon, the meaning of a sentence.... are all eminently psychological or subjective events, with no simple physical explanations. When does that wavelength, retinal activity, neural firing, and so forth become "blue?"

Wundt also prefigures the Gestalt psychologists in rejecting the associationism of Locke and Hume: Psychological structures are more than just the sum of their parts!

He and his students concluded that consciousness is composed of two "stages:" First, there is a large capacity working memory called the ***Blickfeld***. Then there is a narrower consciousness called ***Apperception***, which we might translate as selective attention, which is under voluntary control and moves about within the ***Blickfeld***.

This selective attention idea became very influential. It led, among other things, to Kraepelin's theory of schizophrenia as a breakdown of attention processes.

Psycholinguistics

Another aspect of Wundtian psychology was its psycholinguistics, which actually takes up the first 2 books of ***Völkerpsychologie***. Wundt suggested that the fundamental unit of language is the sentence – not the word or the sound. He identified the sentence not just with a sequence of words and sounds, but as a special mental state. Sounds, words, the rules of grammar, etc., all have their meaning only in relation to that underlying mental sentence.

Wundt actually invented the tree diagram of syntax we are all familiar with in linguistics texts! Language starts with **S** (the sentence) at the top, and selective attention separates the subject (the focus or figure) from the predicate (the ground), and so on, in contrast to the popular bottom-up, associationistic conception the behaviorists proposed. Wundt's ideas are now the standard – yet no one remembers they were his in the first

place!

Looking at the language of children, Wundt and his students proposed that language has its origins in emotional sounds and gestures – another theory that is returning into favor.

Emotions

According to Wundt we are first of all emotional creatures. All of our mental activities involve emotion. And emotion precedes cognition! He was very much the romantic (in the philosophical sense!).

He used a variety of terms: **Feelings** were what he called the basic, short-lived experiences; **Moods** were the more long-lived versions. **Emotions** proper were the more complex experiences. And **motivations** were the more "pressurized" versions of emotion that lead to behavior.

Wundt disagreed with William James and the James-lange theory of emotions. James believed that we first respond to a situation, and then we experience the emotion. Wundt pointed out that introspection clearly shows that the emotion comes first – then we have physiological and behavioral consequences.

He felt that we could not come up with some organized list of emotions: They blend into each other too much. But we could determine several quality dimensions with which to describe them, three in particular:

1. pleasure vs displeasure
2. high vs low arousal
3. strained (or controlled) attention vs relaxed attention

Volition

Wundt felt that volition – acts of will, "decision and choice" – were so significant to understanding psychology, that he wound up calling his theory voluntaristic psychology.

Volition is really motivation, and volitional action is motivated behavior. It comes out of a creative synthesis of other emotional qualities. Students of psychology often learn about Wundt's reaction time experiments – he really saw these as studies of volition.

The work done in his labs on volition would influence the Belgian phenomenologist Albert Michotte, who in turn would influence people such as Heider, Lewin, and Festinger who would be very influential in the new specialty called social psychology.

Volition and volitional acts can range from impulses and automatic, nearly reflexive acts to complex decisions and acts that require great effort. Many controlled actions become automatic over time, which then frees us up for more complicated volitional work. In fact, it was the development of logical thought that Wundt considered the very highest form of will that humans are capable of. He was quite optimistic about our potential in that regard!

Functionalism

Functionalism as a psychology developed out of **Pragmatism** as a philosophy: To find the meaning of an idea, you have to look at its consequences (see where it leads). So truth is what is useful, practical, pragmatic. This led James and his students towards an emphasis on cause and effect, prediction and control, and observation of environment and behavior, over the careful introspection of the Structuralists.

Pragmatism blended easily with Darwinism: To understand an idea, ask "what is it good for?" i.e. what is its

function in the organism, what is its purpose in an ecosystem, how does it add to a creature's chances of survival and reproduction?

Some aspects of Functionalism were clearly just "anti-structuralism," a reflection, perhaps, of James' impatience with details and poor grasp of the German language. In particular, he felt that the structuralists were ignoring the whole and paying too much attention to the tidbits. The anti-structuralism of later functionalists was based more on Titchener's inaccurate interpretation of Wundt's work rather than on Wundt's work itself.

Emotion

An example of functionalist thinking can be found in James' view of emotions (the James-Lange theory):

Our natural way of thinking about these standard emotions is that the mental perception of some fact excites the mental affection called the emotion, and that this latter state of mind gives rise to the bodily expression. My thesis on the contrary is that the bodily changes follow directly the PERCEPTION of the exciting fact, and that our feeling of the same changes as they occur IS the emotion. Common sense says, we lose our fortune, are sorry and weep; we meet a bear, are frightened and run; we are insulted by a rival, are angry and strike. The hypothesis here to be defended says that this order of sequence is incorrect, that the one mental state is not immediately induced by the other, that the bodily manifestations must first be interposed between, and that the more rational statement is that we feel sorry because we cry, angry because we strike, afraid because we tremble, and not that we cry, strike, or tremble, because we are sorry, angry, or fearful, as the case may be. Without the bodily states following on the perception, the latter would be purely cognitive in form, pale, colourless, destitute of emotional warmth. We might then see the bear, and judge it best to run, receive the insult and deem it right to strike, but we could not actually feel afraid or angry.

...

To begin with, readers of the Journal do not need to be reminded that the nervous system of every living thing is but a bundle of predispositions to react in particular ways upon the contact of particular features of the environment. As surely as the hermit-crab's abdomen presupposes the existence of empty whelk-shells somewhere to be found, so surely do the hound's olfactories imply the existence, on the one hand, of deer's or foxes' feet, and on the other, the tendency to follow up their tracks. The neural machinery is but a hyphen between determinate arrangements of matter outside the body and determinate impulses to inhibition or discharge within its organs. When the hen sees a white oval object on the ground, she cannot leave it; she must keep upon it and return to it, until at last its transformation into a little mass of moving chirping down elicits from her machinery an entirely new set of performances. The love of man for woman, or of the human mother for her babe, our wrath at snakes and our fear of precipices, may all be described similarly, as instances of the way in which peculiarly conformed pieces of the world's furniture will fatally call forth most particular mental and bodily reactions, in advance of, and often in direct opposition to, the verdict of our deliberate reason concerning them. The labours of Darwin and his successors are only just beginning to reveal the universal parasitism of each creature upon other special things, and the way in which each creature brings the signature of its special relations stamped on its nervous system with it upon the scene.

...

Whistling to keep up courage is no mere figure of speech. On the other hand, sit all day in a moping posture, sigh, and reply to everything with a dismal voice, and your melancholy lingers. There is no more valuable precept in moral education than this, as all who have experience know: if we wish to conquer undesirable emotional tendencies in ourselves, we must assiduously, and in the first instance

cold-bloodedly, go through the outward motions of those contrary dispositions we prefer to cultivate. The reward of persistency will infallibly come, in the fading out of the sullenness or depression, and the advent of real cheerfulness and kindness in their stead. Smooth the brow, brighten the eye, contract the dorsal rather than the ventral aspect of the frame, and speak in a major key, pass the genial compliment, and your heart must be frigid indeed if it do not gradually thaw!

In the first paragraph, note the holistic idea that emotion is nothing without the body. In the second, he points out that emotion has evolutionary purpose. And in the third, James emphasizes a practical application of his theory!

Habit

From a historical perspective, it was James' emphasis on habit that ignited the interest of his followers, and paved the road for the development of American behaviorism. Again, here is James in his own words:

When we look at living creatures from an outward point of view, one of the first things that strike us is that they are bundles of habits. In wild animals, the usual round of daily behavior seems a necessity implanted at birth; in animals domesticated, and especially in man, it seems, to a great extent, to be the result of education. The habits to which there is an innate tendency are called instincts; some of those due to education would by most persons be called acts of reason. It thus appears that habit covers a very large part of life, and that one engaged in studying the objective manifestations of mind is bound at the very outset to define clearly just what its limits are.

...

So nothing is easier than to imagine how, when a current once has traversed a path, it should traverse it more readily still a second time. But what made it ever traverse it the first time?[5] In answering this question we can only fall back on our general conception of a nervous system as a mass of matter whose parts, constantly kept in states of different tension, are as constantly tending to equalize their states. The equalization between any two points occurs through whatever path may at the moment be most pervious. But, as a given point of the system may belong, actually or potentially, to many different paths, and, as the play of nutrition is subject to accidental changes, blocks may from time to time occur, and make currents shoot through unwonted lines. Such an unwonted line would be a new-created path, which if traversed repeatedly, would become the beginning of a new reflex arc. All this is vague to the last degree, and amounts to little more than saying that a new path may be formed by the sort of chances that in nervous material are likely to occur. But, vague as it is, it is really the last word of our wisdom in the matter.[6]

...

Habit is thus the enormous fly-wheel of society, its most precious conservative agent. It alone is what keeps us all within the bounds of ordinance, and saves the children of fortune from the envious uprisings of the poor. It alone prevents the hardest and most repulsive walks of life from being deserted by those brought up to tread therein. It keeps the fisherman and the deck-hand at sea through the winter; it holds the miner in his darkness, and nails the countryman to his log-cabin and his lonely farm through all the months of snow; it protects us from invasion by the natives of the desert and the frozen zone. It dooms us all to fight out the battle of life upon the lines of our nurture or our early choice, and to make the best of a pursuit that disagrees, because there is no other for which we are fitted, and it is too late to begin again. It keeps different social strata from mixing. Already at the age of twenty-five you see the professional mannerism settling down on the young commercial traveller, on the young doctor, on the young minister, on the young counsellor-at-law. You see the little lines of cleavage running through the character, the tricks of thought, the prejudices, the ways of the 'shop,' in a word, from which the man can by-and-by no more escape than

his coat-sleeve can suddenly fall into a new set of folds. On the whole, it is best he should not escape. It is well for the world that in most of us, by the age of thirty, the character has set like plaster, and will never soften again.

Commonalities

In reality, structuralism and functionalism were more like each other and different from modern mainstream psychology in that both were free-willist and anti-materialistic, and both considered the proper study of psychology to be the mind:

Wundt:

"Mind," "intellect," "reason," "understanding," etc., are concepts... that existed before the advent of any scientific psychology. The fact that the naive consciousness always and everywhere points to internal experience as a special source of knowledge, may, therefore, be accepted for the moment as sufficient testimony to the right of psychology as a science... "Mind," will accordingly be the subject to which we attribute all the separate facts of internal observation as predicates. The subject itself is determined wholly and exclusively by its predicates.

James:

There is only one primal stuff or material in the world, a stuff of which everything is composed, and... we call that stuff "pure experience."

Both Wundt and James were empiricists, and considered their psychologies experimental. Neither liked the rationalistic systems prevalent in the philosophy of their day – such as Hegel's grand system. However, neither were anything like what most people understand as experimentalists today, because neither of them were materialists or reductionists.

Wundt on materialism:

If we could see every wheel in the physical mechanism whose working the mental processes are accompanying, we should still find no more than a chain of movements showing no trace whatsoever of their significance for mind... (All) that is valuable in our mental life still falls to the psychical side.

James' friend and teacher Peirce on materialism:

The materialistic doctrine seems to me quite as repugnant to scientific logic as to common sense; since it requires us to suppose that a certain kind of mechanism will feel, which would be a hypothesis absolutely irreducible to reason – an ultimate, inexplicable regularity; while the only possible justification of any theory is that it should make things clear and reasonable.

And Mary Calkins*, one of James' students, on James' view of introspection:

From introspection he derives the materials for psychology. "Introspective observation," he expressly asserts, "is what we have to rely on first and foremost and always...."

As for the historical influential differences between Wundt and James: While Wundt focused on the introspection of consciousness, James focused on behavior in environment. This focus would lay the groundwork for a behaviorism that James would scarcely recognize.

It would be nearly a century before research psychology would come back from a long sojourn in materialistic, reductionistic, quantitative, physiological, behavioristic methods to something Wundt and James would recognize as psychology!

* Mary Whiton Calkins was one of the first female students of psychology, as well as the founder of the psychology program at Wellesley. She studied under James and Munsterberg at Harvard, but was not given the PhD she richly deserved – because she was a woman! After she died, students appealed to Harvard to grant her the PhD posthumously. They turned her down again. Shame on Harvard!

Selection from: The Stream of Consciousness (1892) by William James*

The first and foremost concrete fact which every one will affirm to belong to his inner experience is the fact that consciousness of some sort goes on. 'States of mind' succeed each other in him. If we could say in English 'it thinks,' as we say 'it rains' or 'it blows,' we should be stating the fact most simply and with the minimum of assumption. As we cannot, we must simply say that thought goes on.

....How does it go on? We notice immediately four important characters in the process, of which it shall be the duty of the present chapter to treat in a general way :

1) Every 'state' tends to be part of a personal consciousness. 2) Within each personal consciousness states are always changing. 3) Each personal consciousness is sensibly continuous. 4) It is interested in some parts of its object to the exclusion of others, and welcomes or rejects – chooses from among them, in a word – all the while.

In considering these four points successively, we shall have to plunge in *medias res* as regards our nomenclature and use psychological terms which can only be adequately defined in later chapters of the book. But every one knows what the terms mean in a rough way; and it is only in a rough way that we are now to take them. This chapter is like a painter's first charcoal sketch upon his canvas, in which no niceties appear.

[Personal Nature of Consciousness]

When I say every 'state' or 'thought' is part of a personal consciousness, 'personal consciousness' is one of the terms in question. Its meaning we know so long as no one asks us to define it, but to give an accurate account of it is the most difficult of philosophic tasks. This task we must, confront in the next chapter; here a preliminary word will suffice.

In this room – this lecture-room, say – there are a multitude of thoughts, yours and mine, some of which cohere mutually, and some not. They are as little each-for-itself and reciprocally independent as they are all-belonging-together. They are neither: no one of them is separate, but each belongs with certain others and with none beside. My thought belongs with my other thoughts, and your thought with your other thoughts. Whether anywhere in the room there be a mere thought, which is nobody's thought, we have no means of ascertaining, for we have no experience of its like. The only states of consciousness that we naturally deal with are found in personal consciousness, minds, selves, concrete particular I's and you's.

Each of these minds keeps its own thoughts to itself. There is no giving or bartering between them. No thought even comes into direct sight of a thought in another personal consciousness than its own. Absolute insulation, irreducible pluralism, is the law. It seems as if the elementary psychic fact were not thought or this thought or that thought, but my thought, every thought being owned. Neither contemporaneity, nor proximity in space, nor similarity of quality and content are able to fuse thoughts together which are sundered by this barrier of belonging to different personal minds. The breaches between such thoughts are the most absolute breaches in nature. Every one will recognize this to be true, so long as the existence of something corresponding to the term 'personal mind' is all that is insisted on, without any particular view of its nature being implied. On these terms the personal self rather than the thought might be treated as the immediate datum in psychology. The universal conscious fact is not 'feelings and thoughts exist,' but 'I think' and 'I feel.' No psychology, at any rate, can question the existence of personal selves. Thoughts connected as we feel them to be connected are what we mean by personal selves. The worst a psychology can do is so to

* First published in Psychology, Chapter XI. (Cleveland & New York, World).

interpret the nature of these selves as to rob them of their worth.

[Consciousness in Constant Change]

Consciousness is in constant change. I do not mean by this to say that no one state of mind has any duration – even if true, that would be hard to establish. What I wish to lay stress on is this, that no state once gone can recur and be identical with what it was before. Now we are seeing, now hearing; now reasoning, now willing; now recollecting, now expecting; now loving, now hating; and in a hundred other ways we know our minds to be alternately engaged....

....The grass out of the window now looks to me of the same green in the sun as in the shade, and yet a painter would have to paint one part of it dark brown, another part bright yellow, to give its real sensational effect. We take no heed, as a rule, of the different way in which the same things look and sound and smell at different distances and under different circumstances. The sameness of the things is what we are concerned to ascertain; and any sensations that assure us of that will probably be considered in a rough way to be the same with each other....

Such a difference as this could never have been sensibly learned; it had to be inferred from a series of indirect considerations. These make us believe that our sensibility is altering all the time, so that the same object cannot easily give us the same sensation over again. We feel things differently accordingly as we are sleepy or awake, hungry or full, fresh or tired; differently at night and in the morning, differently in summer and in winter; and above all, differently in childhood, manhood, and old age. And yet we never doubt that our feelings reveal the same world, with the same sensible qualities and the same sensible things occupying it. The difference of the sensibility is shown best by the difference of our emotion about the things from one age to another, or when we are in different organic moods, What was bright and exciting becomes weary, flat, and unprofitable. The bird's song is tedious, the breeze is mournful, the sky is sad.

....From one year to another we see things in new lights. What was unreal has grown real, and what was exciting is insipid. The friends we used to care the world for are shrunken to shadows; the women once so divine, the stars, the woods, and the waters, how now so dull and common! – the young girls that brought an aura of infinity, at present hardly distinguishable existences; the pictures so empty; and as for the books, what was there to find so mysteriously significant in Goethe, or in John Mill so full of weight? Instead of all this, more zestful than ever is the work, the work; and fuller and deeper the import of common duties and of common goods.

[The Continuity of Thought]

....No doubt it is often convenient to formulate the mental facts in an atomistic sort of way, and to treat the higher states of consciousness as if they were all built out of unchanging simple ideas which 'pass and turn again.' It is convenient often to treat curves as if they were composed of small straight lines, and electricity and nerve-force as if they were fluids. But in the one case as in the other we must never forget that we are talking symbolically, and that there is nothing in nature to answer to our words. A permanently existing 'Idea' which makes its appearance before the footlights of consciousness at periodical intervals is as mythological an entity as the Jack of Spades.

Within each personal consciousness, thought is sensibly continuous. I can only define 'continuous' as that which is without breach, crack, or division. The only breaches that can well be conceived to occur within the limits of a single mind would either be interruptions, time-gaps during which the consciousness went out; or they would be breaks in the content of the thought, so abrupt that what followed had no connection whatever with what went before. The proposition that consciousness feels continuous, means two things:

a. That even where there is a time-gap the consciousness after it feels as if it belonged together with the consciousness before it, as another part of the same self;

b. That the changes from one moment to another in the quality of the consciousness are never absolutely abrupt.

The case of the time-gaps, as the simplest, shall be taken first.

....When Paul and Peter wake up in the same bed, and recognize that they have been asleep, each one of them mentally reaches back and makes connection with but one of the two streams of thought which were broken by the sleeping hours. As the current of an electrode buried in the ground unerringly finds its way to its own similarly buried mate, across no matter how much intervening earth; so Peter's present instantly finds out Peter's past, and never by mistake knits itself on to that of Paul. Paul's thought in turn is as little liable to go astray. The past thought of Peter is appropriated by the present Peter alone. He may have a knowledge, and a correct one too, of what Paul's last drowsy states of mind were as he sank into sleep, but it is an entirely different sort of knowledge from that which he has of his own last states. He remembers his own states, whilst he only conceives Paul's. Remembrance is like direct feeling; its object is suffused with a warmth and intimacy to which no object of mere conception ever attains. This quality of warmth and intimacy and immediacy is what Peter's present thought also possesses for itself. So sure as this present is me, is mine, it says, so sure is anything else that comes with the same warmth and intimacy and immediacy, me and mine. What the qualities called warmth and intimacy may in themselves be will have to be matter for future consideration. But whatever past states appear with those qualities must be admitted to receive the greeting of the present mental state, to be owned by it, and accepted as belonging together with it in a common self. This community of self is what the time-gap cannot break in twain, and is why a present thought, although not ignorant of the time-gap, can still regard itself as continuous with certain chosen portions of the past.

Consciousness, then, does not appear to itself chopped up in bits. Such words as 'chain' or 'train' do not describe it fitly as it presents itself in the first instance. It is nothing jointed; it flows. A 'river' or a 'stream' are the metaphors by which it is most naturally described. In talking of it hereafter, let us call it the stream of thought, of consciousness, or of subjective life....

[Substantive and Transitive States of Mind]

....When we take a general view of the wonderful stream of our consciousness, what strikes us first is the different pace of its parts. Like a bird's life, it seems to be an alternation of flights and perchings. The rhythm of language expresses this, where every thought is expressed in a sentence, and every sentence closed by a period. The resting-places are usually occupied by sensorial imaginations of some sort, whose peculiarity is that they can be held before the mind for an indefinite time, and contemplated without changing; the places of flight are filled with thoughts of relations, static or dynamic, that for the most part obtain between the matters contemplated in the periods of comparative rest.

Let us call the resting-places the 'substantive parts,' and the places of flight the 'transitive parts,' of the stream of thought. It then appears that our thinking tends at all times towards some other substantive part than the one from which it has just been dislodged. And we may say that the main use of the transitive parts is to lead us from one substantive conclusion to another.

Now it is very difficult, introspectively, to see the transitive parts for what they really are. If they are but flights to a conclusion, stopping them to look at them before the conclusion is reached is really annihilating them. Whilst if we wait till the conclusion be reached, it so exceeds them in vigor and stability that it quite eclipses and swallows them up in its glare. Let anyone try to cut a thought across in the middle and get a look at its section, and he will see how difficult the introspective observation of the transitive tracts is. The rush of the thought is so headlong that it almost always brings us up at the conclusion before we can rest it. Or if our purpose is nimble enough and we do arrest it, it ceases forthwith to itself. As a snowflake crystal caught in the warm hand is no longer a crystal but a drop, so, instead of catching the feeling of relation moving to its term, we find we have caught some substantive thing, usually the last word we were pronouncing, statically taken, and with its function, tendency, and particular meaning in the sentence quite evaporated. The attempt at introspective analysis in these cases is in fact like seizing a spinning top to catch its motion, or trying to

turn up the gas quickly enough to see how the darkness looks....

We ought to say a feeling of and, a feeling of if, a feeling of but, and a feeling of by, quite as readily as we say a feeling of blue or a feeling of cold. Yet we do not: so inveterate has our habit become of recognizing the existence of the substantive parts alone, that language almost refuses to lend itself to any other use....

[Fringes of Experience]

The object before the mind always has a 'Fringe.' There are other unnamed modifications of consciousness just as important as the transitive states, and just as cognitive as they. Examples will show what I mean....

Suppose we try to recall a forgotten name. The state of our consciousness is peculiar. There is a gap therein; but no mere gap. It is a gap that is intensely active. A sort of wraith of the name is in it, beckoning us in a given direction, making us at moments tingle with the sense of our closeness, and then letting us sink back without the longed-for term. If wrong names are proposed to us, this singularly definite gap acts immediately so as to negate them. They do not fit into its mould. And the gap of one word does not feel like the gap of another, all empty of content as both might seem necessarily to be when described as gaps. When I vainly try to recall the name of Spalding, my consciousness is far removed from what it is when I vainly try to recall the name of Bowles. There are innumerable consciousnesses of want, no one of which taken in itself has a name, but all different from each other. Such feeling of want is *tota cōlo* other than a want of feeling: it is an intense feeling. The rhythm of a lost word may be there without a sound to clothe it; or the evanescent sense of something which is the initial vowel or consonant may mock us fitfully, without growing -more distinct. Every one must know the tantalizing effect of the blank rhythm of some forgotten verse, restlessly dancing in one's mind, striving to be filled out with words.

....The traditional psychology talks like one who should say a river consists of nothing but pailsful, spoonsful, quartpotsful, barrelsful, and other moulded forms of water. Even were the pails and the pots all actually standing in the stream, still between them the free water would continue to flow. It is just this free water of consciousness that psychologists resolutely overlook. Every definite image in the mind is steeped and dyed in the free water that flows round it. With it goes the sense of its relations, near and remote, the dying echo of whence it came to us, the dawning sense of whither it is to lead. The significance, the value, of the image is all in this halo or penumbra that surrounds and escorts it, – or rather that is fused into one with it and has become bone of its bone and flesh of its flesh; leaving it, it is true, an image of the same thing it was before, but making it an image of that thing newly taken and freshly understood.

Let us call the consciousness of this halo of relations around the image by the name of 'psychic overtone' or 'fringe.'

[Attention]

....The last peculiarity to which attention is to be drawn in this first rough description of thought's stream is that – Consciousness is always interested more in one part of its object than in another, and welcomes and rejects, or chooses, all the while it thinks.

The phenomena of selective attention and of deliberative will are of course patent examples of this choosing activity. But few of us are aware how incessantly it is at work in operations not ordinarily called by these names. Accentuation and Emphasis are present in every perception we have. We find it quite impossible to disperse our attention impartially over a number of impressions. A monotonous succession of sonorous strokes is broken up into rhythms, now of one sort, now of another, by the different accent which we place on different strokes. The simplest of these rhythms is the double one, tick-t—ck, tick-t—ck, tick-t—ck. Dots dispersed on a surface are perceived in rows and groups. Lines separate into diverse figures. The ubiquity of the distinctions, this and that, here and there, now and then, in our minds is the result of our laying the same selective emphasis on parts of place and time

But we do far more than emphasize things, and unite some, and keep others apart. We actually ignore most of the things before us. Let me briefly show how this goes on.

....what is called our 'experience' is almost entirely determined by our habits of attention. A thing may be present to a man a hundred times, but if he persistently fails to notice it, it cannot be said to enter into his experience. We are all seeing flies, moths, and beetles by the thousand, but to whom, save an entomologist, do they say anything distinct? On the other hand, a thing met only once in a lifetime may leave an indelible experience in the memory. Let four men make a tour in Europe. One will bring home only picturesque impressions – costumes and colors, parks and views and works of architecture, pictures and statues. To another all this will be non-existent; and distances and prices, populations and drainage-arrangements, door-and window-fastenings, and other useful statistics will take their place. A third will give a rich account of the theatres, restaurants, and public halls, and naught besides; whilst the fourth will perhaps have been so wrapped in his own subjective broodings as to be able to tell little more than a few names of places through which he passed. Each has selected, out of the same mass of presented objects, those which suited his private interest and has made his experience thereby....

If now we pass to the æsthetic department, our law is still more obvious. The artist notoriously selects his items, rejecting all tones, colors, shapes, which do not harmonize with each other and with the main purpose of his work. That unity, harmony, 'convergence of characters,' as M. Taine calls it, which gives to works of art their superiority over works of nature, is wholly due to elimination. Any natural subject will do, if the artist has wit enough to pounce upon some one feature of it as characteristic, and suppress all merely accidental items which do not harmonize with this.

Ascending still higher, we reach the plane of Ethics, where choice reigns notoriously supreme. An act has no ethical quality whatever unless it be chosen out of several all equally possible.... When he debates, Shall I commit this crime? choose that profession? accept that office, or marry this fortune? – his choice really lies between one of several equally possible future Characters.....The problem with the man is less what act he shall now resolve to do than what being he shall now choose to become.

[Me and not-me]

....One great splitting of the whole universe into two halves is made by each of us; and for each of us almost all of the interest attaches to one of the halves; but we all draw the line of division between them in a different place. When I say that we all call the two halves by the same names, and that those names are 'me' and 'not-me' respectively, it will at once be seen what I mean. The altogether unique kind of interest which each human mind feels in those parts of creation which it can call me or mine may be a moral riddle, but it is a fundamental psychological fact. No mind can take the same interest in his neighbor's me as in his own. The neighbor's me falls together with all the rest of things in one foreign mass against which his own me stands cut in startling relief. Even the trodden worm, as Lotze somewhere says, contrasts his own suffering self with the whole remaining universe, though he have no clear conception either of himself or of what the universe may be. He is for me a mere part of the world; for him it is I who am the mere part. Each of us dichotomizes the Kosmos in a different place.

Free Will

The concept of free will has undergone some hard times lately. The obvious success of science, and the materialistic, deterministic, reductionistic assumptions that usually accompany it, have made free will seem old-fashioned, associated more with scholastic theologians than modern men and women. But I find the concept impossible to ignore, much less dispose of.

Let's begin by saying what free will is, and what it isn't. Free will is not the same as freedom of action. Freedom of action refers to things that prevent a willed action from being realized. For example, being in prison means you are not free to paint the town red. Being in a straight jacket means you are not free to wave hello. Being paralyzed means not being able to move your limbs. These are not issues of free will. Free will means being free to try to escape (or not), to try to wave (or not), to try to move your limbs (or not).

Neither is free will the same as political or social freedom (better known as liberty). Just because you will be executed for taking the local dictator's name in vain, doesn't mean you aren't free to try, or even free to actually do so. You'll just wind up paying for the satisfaction.

On the other side of the argument, I need to point out that determinism is not the same thing as fatalism, destiny, or predestination. Determinism means that the way things are at one moment is the necessary result of the ways things were the moment before. It means that every effect has its cause, and that nothing, not even the will, is exempt. It does not mean that the future is already established.

It might also be useful to define will. As I understand it, it is a matter of intent: The perceptual, cognitive, and emotional processes we engage in when confronted by a choice result in an intent to engage in certain actions or non-actions. I have before me a cheese danish and a poppy seed muffin. I look, I sniff, I consider past experiences, I feel good about both prospects, and then I decide. I intend to eat the cheese danish (or the muffin, or neither, or both...). Whether I am free to actually eat it, or whether I can expect severe punishment for doing so, is irrelevant. I have made up my mind!

Let's run through some arguments for free will, followed by the determinist's responses. Since the free willist is making a claim, and an exceptional one at that, the burden of proof is on him or her.

First, there is the experience argument. I experience something within myself that I understand as making choices, and that those choices are not determined by anything other than myself.

The determinist will respond that you are simply not aware of the causes of your decisions, and have labeled that ignorance "free will." There were no doubt neurons firing and chemicals sailing across synapses and so forth, all very deterministically resulting in my choice of the danish.

The free willist might suggest that belief is a crucial part of free will. If you were to set me up with the danish and the muffin, knowing that I tend to choose danishes, you might very well say the end result was determined. But if I knew you were trying to prove your point, I would simply choose the muffin instead, or neither.

The determinist would simply say that this extra tidbit of knowledge – that I am trying to fool you – has replaced your usual causal factors. Instead, you are reacting, quite mechanically, to a threat to your beliefs.

Maybe so, says the free willist. But you must admit that I can be awfully random at times. I can suddenly jump out of my chair and scream "Tippecanoe and Tyler, too" at the top of my lungs. Let's see you predict something like that!

The determinist would respond that indeterminism is far from free will. If that's all there is to free will, then a roulette wheel is better at it than you are.

But I am unpredictable, says the free willist.

The determinist would point out that that is merely a practical problem, not a philosophical one. The fact that

I cannot pin point the precise location and velocity, say, of all the particles in the universe, doesn't mean that you aren't determined by them. In fact, even if that were theoretically impossible (as suggested by the Heisenberg uncertainty principle), it only means I can't predict, not that you have free will!

The free willist may point out that, without free will, morality has no meaning. All the best things about people – generosity, bravery, compassion – have no meaning. If we are as determined as falling bricks, then Adolph Hitler could no more be blamed for his evil actions than Mother Teresa could be praised for her good ones. What then of our world?

Simple, says the determinist. We will have to live without morality. Many people are already moral relativists, or even moral nihilists. Our societies can get along just fine with laws and judicial processes and prisons using nothing more than tradition, majority self-interest, reciprocity, and the rule of cover-your-ass. Maybe that's all morality has ever been!

Another argument a free willist can make is that we have this unique ability to stop and think about a decision-making situation. We can exit the stream of cause-and-effect for a moment. We pause before the high-calorie meal to consider the advisability of diving in. Animals rarely do this: If a hungry lion has an antelope before her, she eats. And we can postpone the decision as long as we like. Even if the actual choice we make at some particular moment in time is determined, the length of time we wait for that moment to arrive is not.

Or is it? says the determinist. What caused you to wait exactly one minute before choosing? Or what caused you to stop your pausing and jump into things at just that moment? Besides, isn't this pause just a matter of two forces of equal strength short-circuiting the normal processes?

Jean-Paul Sartre came up with an interesting free will argument. He said that we can ignore something real and we can pretend something unreal. For example, I could imagine that there is no danish before me – something I often need to do in the service of dieting. Or I can see the poppy seeds in the muffins as maggots. This imagination is a powerful thing! But the determinist would just say that imagination is just one more neurological mechanism, explainable by deterministic principles.

I must point out that, although the free willist has not exactly won any arguments so far, the determinist has put himself in a somewhat more defensive position. Some of that "burden of proof" is moving over to the determinist side. For example, he has claimed that imagination is something physical. That is a claim that we need not just accept: We can challenge him to demonstrate the validity of the claim.

Another possible foundation for free will is creativity. I can create a new option. I am not stuck with the cheese danish or the poppy seed muffin. I can throw them both and choose a bag of cheesy puffs. Or I can literally create a new concoction: Get out my mixing bowls and bake something no one has ever seen before, such as a poppy seed danish or a cheese muffin. Or I can get out my blender and make a muffin and danish slurpy.

Of course, the determinist, becoming rather tiresome by now, would just say that creativity is just a word we use to label unconscious neural events that surprise even us – an accident. If someone steps on your danish and muffin by accident, no one would think to call the wad on the bottom of his shoe a new creation!

(Of course, the determinist is claiming now that creativity is mechanical – something he could be challenged to defend.)

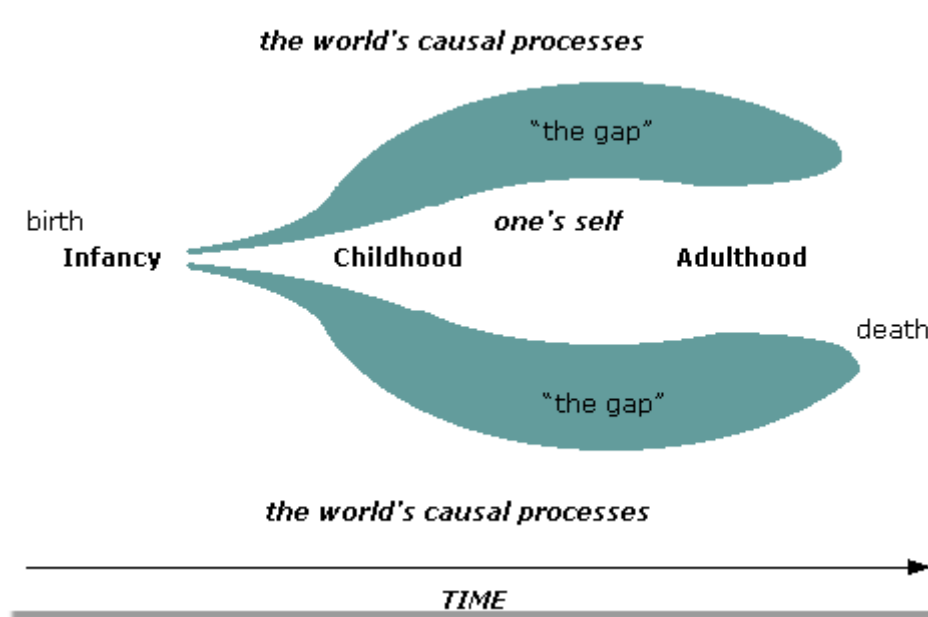
So, how about differentiating between causes and reasons? When I get myself a Big Mac, is it cause-and-effect determinism that led me there? Did the growling in my stomach force me into my car, the sight of the golden arches make me jerk my steering wheel in their direction? Or did I notice my appetite and conceive a plan: Look through my repertoire of gastronomic delights, I decide on a Big Mac, drive purposefully to the golden arches, and order what I want? Was I, in other words, "pushed from behind" by causes, or did I follow my reasons?

This is called teleology. Instead of reacting to stimuli, we project a future situation which we take as a goal. The connection between cause-and-effect is one of necessity. There is nothing necessary about purposes.

They can be accomplished – or not.

But the determinist would respond with the same argument he made with imagination and creativity: Your perceptions and cognitions and emotions, your past experiences, inevitably lead to your projecting that goal and working toward it. It only appears to you to be free of necessity. But note how quickly we give up our goals when other, more powerfully supported forces push in upon us.

One last try for free will: I suggest that, as we develop from babies into adults, we separate from the world. Our causal processes become increasingly independent of the causal processes outside of us, especially in the mental realm. A gap develops that allows us to be influenced by outside situations, but not determined by them. This gap is like a large river: The man on the opposite bank can wave and jump and yell all he wants – he cannot directly affect us. But we can listen to him or interpret his semaphore signals. We can treat his antics as information to add to all the information we have gathered over our lives, and use that information to guide our decisions – influenced, but not caused.



The baby begins life nearly as intimately connected with his or her world as in the womb. By the end of life, some of us are impervious to what others think about us, can rise above any threat or seductive promise, can ignore nearly any kind of urge or pain. In one sense, we are still determined – determined by that developing person we are, determined by our selves. But nothing else in our present circumstances, or even in our past going way back to some time in childhood when that gap was first fully realized, is more than information to utilize in making free decisions.

I know very well that the determinist can respond to this idea as well. But now he is as much on the defensive as the free willist has ever been. In fact, the undecided listener may begin to conclude that it is the deterministic stance – nothing is free! – that is the more extreme, less reasonable one.

Addendum

Some students have complained that I have left the job unfinished, and that I should continue the argument to a conclusion. In other words, they want to know what students always want to know: What is the answer? Or at least, what do I think is the answer. Although I would rather see students come up with their own answers, here is how I see the issue:

The argument of free will versus determinism is in some measure a false one. Both sides have been reduced to straw men (easily destroyed arguments) by oversimplification. For example, free will has never meant freedom to ignore the laws of nature, and determinism does not mean everything is predictable. Perhaps the best thing we can do to get past the stalemate is to develop a new concept that points to the complexity of the person and his or her interaction with the world. Instead of free will versus determinism, maybe we should adopt Albert Bandura's preferred term: *Self-determination*.

As a middle-aged man, I have dozens of years of experiences – my childhood, my cultural inheritance, the books I've read, conversations with friends, my own thoughts – that have made me who I am today. All this is on top of my unique genetics and other physical realities of who I am. The things that happen to me *now* are experienced *through* this mass of uniqueness, and my responses depend, not only on my present situation, but on all that I *am*. This may not be "free will" in the absolute sense, but it is certainly self-determination.

If we possess this (somewhat limited) freedom, we also possess a (somewhat limited) responsibility for our actions. For most adults, it can be legitimately claimed that who we are includes basic moral concepts and a rational respect for the law conveyed to us by our parents and others. These things are a part of who we are, and are available to us when we make a choice to behave one way or another. We are therefore culpable if we disregard these moral and legal concepts. This dovetails nicely into the legal tradition that asks whether or not a person actually *knows* right from wrong, and whether the person has the maturity or the cognitive wherewithall to *choose* right over wrong.

In other words, we don't have to be "above" the natural world in order to have a degree of freedom within that world.

The History of Psychology

Part One: The Ancients

Part Two: The Rebirth

Part Four: The 1900's

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