

Mental Health & Drugs; A Map of the Mind

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ABSTRACT



The practice of physical medicine underwent a sea change at the turn of the 20th century, but the management of mental disorders stayed much the same as it had been since Rome. New names have been coined for disorders, and synthetic drugs are advertised as a solution to every problem, but the causes are still largely unknown and, although spontaneous remission can occur, there are no cures. This review of psychiatric diagnosis and treatment from Rome to the 21st century offers a rationale to support the classic (and still current) classification of disorders. It offers a method of distinguishing the major kinds of disorders and suggests when the prescription of psychoactive drugs may—or may not—be appropriate.

Category: Review

Received: June 11, 2020

Accepted: July 14, 2020

Keywords:

madness, melancholia, mind, brain

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Introduction

The practice of physical medicine underwent a sea change at the turn of the 20th century, yet the management of mental disorders has stayed much the same as it had been since Rome. New names have been coined for disorders, and synthetic drugs are advertised as a solution to every problem, but the causes are still unknown and, although spontaneous remission can occur, there are no cures. This review of psychiatric diagnosis and treatment from Rome to the 21st century offers a rationale to support the classic (and still current) classification of disorders. It offers a method of distinguishing the major kinds of disorders and suggests when the prescription of psychoactive drugs may—or may not—be appropriate.

The 21st century diagnosis and treatment of mental disorders is—like the weather—much the same as it was in Rome 2,000 years ago. The categories of disorders recognized in antiquity are still the basis of psychiatric diagnosis, and management is still limited to symptom control. Too often this is accomplished through the use of potentially addictive drugs whose subjective effects cannot be measured on any objective scale. By contrast, the treatment of physical diseases, such as diabetes and malaria, involves the use of medicines with objective effects that can and must be measured and monitored [1,2].

Thirty years ago, Paul D. MacLean, MD (1913-2007) identified three relatively discrete levels of mental operations and devised a system that could revolutionize modern psychiatry. Some functions, he said, are *basic*, genetically linked, unconscious, and durable. The bulk of human mental activity—such as the ability to learn and recall—takes place at a largely subconscious *intermediate* level. Human intellect—consciousness, reason, and judgment—is at what MacLean called an *advanced* and probably unique feature of the human mind. The MacLean classification provides a rationale for the historical (and current) categories of disorders as personality patterns, neuroses, schizophrenias, and mood disorders, and it suggests the most appropriate treatments for each.

Most of MacLean's contemporaries dismissed his map, saying the brains of all mammals are anatomically similar, which is true but irrelevant. Mammals also share the same basic skeleton, but bats and giraffes arrange and use that skeleton in quite different ways. Mammalian brains all have much the same anatomy, but mental abilities are variable. Rabbits are able to survive, find food, and reproduce; dogs are smarter and learn complicated tricks. Yet only human beings are conscious of time and capable of contemplating future possibilities. In any case, MacLean was not writing about the *anatomy* of the brain, but about the *functions* of the mind [1,2].

Discussions

Mental disorders have been recognized at least since Hippocrates (460-375 BCE) who is traditionally credited with the diagnosis of *hysteria* (excitability with impairment of sensation or movement). Hippocrates believed hysteria was caused by a wandering uterus (Gk *hystera*, womb), getting stuck where it should not be, an accepted explanation until well into the 19th century.

The most influential physician of all time must be Roman physician Claudius Galen (130-210 CE), who produced a body of work that Western physicians followed until the end of the 19th century. Galen, who was personal physician to three consecutive Roman Emperors, followed an idea attributed to Hippocrates: that the body contained four fluids or *humors*—red (blood), white (phlegm), yellow (bile), and black (unknown). The predominant humor produced a person who could be described as sanguine, phlegmatic, choleric, or melancholic (melena, black + chole). Disease, according to Galen, was due to an imbalance of humors. Madness and melancholia, for instance, called for laxatives to rid the body of the black humor (whatever it might have been), or in the most severe cases, bleeding to cool an overheated brain [3].

Galen taught, and physicians for centuries believed, that there were two kinds of blood (the red humor), and each was distributed in a one-way system. The liver produced dark red blood and sent it to the heart, where it mixed with air from the lungs to be burned and maintain body temperature. Combustion produced bright red blood and a *pneuma* (air, spirit) that rose through the carotid arteries to the brain (arteries are empty after death). Bleeding reduced the available fuel and was therefore the logical treatment for an overheated brain.

In 1628, English physician William Harvey (1578-1657) proved that blood circulates in a loop rather than in two separate channels, but medicine is a conservative profession, and physicians continued to bleed their patients for another two centuries. American physician Benjamin Rush (1745-1813) was a firm believer in bleeding. During a 1793 yellow fever epidemic in Philadelphia, Rush bled several thousand patients and probably killed many of those who might otherwise have survived. The American Psychiatric Association calls Rush the Father of American Psychiatry and his image is on the cover of the American Journal of Psychiatry (before 1921, the American Journal of Insanity) [1,4].

Galen's treatments were intended to restore humoral balance and should be of sufficient potency to convince the patient they were effective. Noga Arikha says *sometimes they were*. Doctors had a ready excuse when treatment failed. Arnaud de Villeneuve (ca. 1235-1312) advised physicians to *just mention obstruction because they do not*

understand what it means, and it helps greatly that a term is not understood by the people.

Most people had only rare access to physicians and they found natural or *botanical* drugs to relieve emotional distress. There are two varieties of psychoactive drugs, the sedative/analgesics such as opium, and stimulants including nicotine and cocaine alkaloids. Psychoactive drugs are almost invariably pleasant and can easily turn relief into addiction. Nothing is always addictive, of course; many people drink alcohol, only a few become alcoholics; some people quit smoking with relative ease, while others resume smoking after cancer surgery.

In 1844, an Italian civil servant named Agostino Bassi (1773-1856) suggested that microscopic organisms (*germs*) might cause diseases. Physicians were highly skeptical, but in 1885, French chemist Louis Pasteur (1822-1895) created a successful rabies vaccine and proved the Germ Theory. That brought about massive change in the practice of medicine at the end of the 19th century [2,5].

The germ theory forced doctors to abandon Galen's humors and look for the real causes of diseases. They were surprised to find that at least one well-known disease, *dropsy* (shortness of breath and edema), was not a disease at all, but rather a *syndrome* that could be the result of several different diseases. A syndrome is a set of symptoms that seem to occur together, and today dropsy is just an interesting footnote in medical texts.

When the cause of a disease—the target of treatment—is known, treatment can be focused and cure is possible. With that in mind, the *International Statistical Commission* asked Jacques Bertillon (1851-1922) to develop a method of classifying diseases to enable statistical comparison. In 1893, he produced the *Bertillon Classification of Causes of Death*, which is the precursor of the modern *International Statistical Classification of Diseases* (ICD) [6].

No edition of the ICD, during the first 50 years of publication, listed mental disorders. Psychiatric or *functional* disorders are syndromes, like dropsy, and statistical evaluation of treatment is impossible when the target of treatment has not been identified. American psychiatrists, feeling excluded from the general practice of medicine, petitioned for the inclusion of their diagnoses, but were refused. The situation changed after European psychiatry had been devastated in World War II. The United Nations (UN) was founded in 1946 and commissioned the World Health Organization (WHO) to assume publication of the sixth edition of the ICD, which was the first to include a section of mental disorders [6].

American psychiatrists were unfortunately not entirely satisfied with the new international nomenclature. They were, in fact, not even in agreement with each other. There were three diagnostic systems—the Standard, Armed Forces, and Veterans Administration—in use. The

American Psychiatric Association (APA) reached a consensus in 1951 and published a unified nomenclature in the *Diagnostic and Statistical Manual of Mental Disorders* (DSM). That gave the Association the right to coin new names, and new ones proliferated [7].

The word *insanity* had been used as a description of madness and melancholia since the early 1600s, but that term was abandoned after the 1843 trial of an illiterate Scot who thought the British government intended to kill him. Daniel McNaughton (there are various spellings), in what he thought was self-defense, shot at Prime Minister Robert Peel, but hit and killed the Minister's secretary instead.

McNaughton was tried for murder but found not guilty by reason of insanity. Queen Victoria was displeased with what she considered undue leniency, and demanded a definition of insanity. Her cabinet debated and eventually devised one, called the McNaughton Rule. According to the Rule, a person should be judged sane and ready to be judged unless *at the time of committing the act, the accused was laboring under a defect of reason so as not to understand the nature and quality of the act or, if the defendant did know it, did the defendant not know that the act was wrong?* That legal definition made *insanity* a **legal** diagnosis, and psychiatrists felt obliged to find other words to describe the problem [1,2].

Carl Friedrich Constatt (1807-1850) is believed to have coined the word *psychosis*. The American Psychiatric Association later abandoned that word, saying it *has historically received a number of different definitions, none of which has achieved universal acceptance*. The lack of a clear definition could apply to all of the other psychiatric diagnoses, not one of which can be proved (or disproved) by any objective evidence [8].

German psychiatrist Emil Kraepelin (1856-1926) preferred to maintain the classic separation of two major categories (madness and melancholia) and suggested *dementia praecox* (premature dementia) and *mania* as better descriptions of *psychosis*. Swiss psychiatrist Paul Eugen Bleuler (1857-1939) preferred *schizophrenia* (L. split + mind) to *dementia praecox*, and that has become the more popular word. The diagnosis of *mania* has been more extensively reworked and become an extensive list of **mood disorders**. Some of these 19th century coinages—such as *schizophrenia* and *clinical depression*—have entered the vernacular and are widely discussed as if they were verified entities, even though not all psychiatrists agree on just what the words mean [2,9].

The first edition of the DSM gave more modern names to the disorders that Galen described. Inherent personality characteristics were listed as **Personality disorders**. The classic syndrome of hysteria was initially classified as a **Psychoneurotic Disorder** (eventually to become one of several *neuroses*), and Galen's madness and melancholia

became two kinds of **Psychotic Disorders** called *schizophrenic* and *affective reactions*. Despite impressive new names, the causes of emotional distress are as mysterious today as they were to Galen [7, 10].

In 1987, the revised Third Edition of the DSM listed 29 names for schizophrenias, and 40 kinds of affective reactions. These new names have little if any clinical value; the APA has admitted *there is no assumption that each category of mental disorder is a completely discrete entity with absolute boundaries dividing it from other mental disorders or from no mental disorder* [11].

The identification of what was causing many diseases led to a 20th century revolution in physical medicine. Bleeding as a prime treatment for madness (schizophrenias) was abandoned, and psychiatrists seem to have thought newer methods were in order. Portuguese neurologist Antonio Egas Moniz (1874-1955) was awarded the Nobel Prize for his *discovery of the therapeutic value of leucotomy* (severance of the frontal lobes from the rest of the brain) *in certain psychoses*. Manfred J. Sakel (1900-1957) used insulin to induce deep coma as a way of encouraging the brain to *reorganize* itself. In 1937, Ugo Cerletti (1887-1963) used an apparatus to induced epileptic-like seizures and reported that a patient who had delusions and hallucinations was able to return to normal life following electroshock therapy. In 1949, Dr. John Cade (1912-1980) experimented with lithium salts as a means of controlling mania. Unfortunately, there is no means of objectively measuring the clinical effectiveness of any of these methods [12].

The more common symptoms of internal conflict, including *anxiety*, *panic*, and *depression*, can be the result of any number of problems. Any or all of these symptoms can be due to an inherent predisposition, anticipated or real loss, a symptom of inner conflict, the loss of reason, or perhaps something as yet unknown. These symptoms can relatively easily be suppressed by psychoactive drugs, but symptom relief does not identify cause; aspirin relieves pain, but no one thinks aspirin corrects a chemical imbalance, or believes that pain is the result of aspirin deficiency. And the use of psychoactive drugs often risks the possibility of abuse, addiction, even overdose and death [1, 2].

Doctors usually try to avoid the prescription of symptom-blockers before the cause of the problem is identified, because the suppression of symptoms may delay finding the cause of the problem. Unfortunately, symptom management is the psychiatrist's only option, even though it may discourage search for causes and add addiction to the problem.

Unnecessarily obscure and esoteric terminology coined by, for, and perhaps understood only by psychiatrists seems to suggest that functional (or psychiatric) disorders are

treatable diseases. That enables the pharmaceutical industry to promote symptom-blocking drugs as if they were medicines and may encourage the use of drugs where they are not needed [2].

The pharmaceutical industry developed out of the 19th century discovery of aniline dyes, of which two — Mercurochrome and Gentian violet—kill germs on contact. That suggested the possibility that other chemicals might be useful in the treatment of disease. Mercurochrome has been banned and is no longer available [13].

German chemist Adolf von Baeyer (1835-1917) synthesized barbituric acid in 1864, but there was no medical use for it. Before long, however, research on similar compounds produced an effective sedative, phenobarbital. The Bayer Company (founded in 1863 by Friedrich Bayer) marketed phenobarbital as **Luminal** in 1912. The industry was subsequently able to produce and sell several other derivatives of barbituric acid, and barbiturates were widely prescribed, profitable, and popular as street drugs as well [14].

The American government prohibited the production, sale, or distribution of opium in 1914, two years after the introduction of the first synthetic substitute, **Luminal**. A commercial derivative of opium, **Heroin**, remained available for another ten years. Several more powerful chemically enhanced forms of opium (opioids) are available today under trade names including Vicodin, Lorcet, Dilaudid, Percocet, OxyContin and others, while the natural product, opium, is still prohibited. The pharmaceutical industry is not required to show that a product is needed or even useful—only that it is not unduly toxic [2].

The prescription and street use of barbiturates dropped precipitously after the introduction of a second family of sedatives, the benzodiazepines that are said to have effects much like alcohol. These popular drugs are sold under at least 30 different trade names, including Librium, Valium, Xanax, Klonopin, Tranxene, and many others [15].

In the late 1930s, Paul Charpentier, chief chemist at Rhone-Poulenc (now Aventis) was looking for a better antihistamine when he synthesized *promethazine*, but this was believed too sedative for general use. Charpentier synthesized several variations of the molecule and in 1952, *chlorpromazine* was marketed as Largactil. In 1954, Smith, Kline & French (now part of GSK) introduced the drug as Thorazine. This drug proved highly useful in controlling symptoms of psychoses and was followed by a number of related chemicals called phenothiazines. Some of the more profitable brands are Mellaril, Prolixin, Serentil, and Trilafon. The subjective effects of these drugs cannot be measured on any objective scale [16].

Withdrawal from any psychoactive drug is often complicated by **rebound**, the return of whatever symptoms

the drug had blocked. The problem of rebound, and the addictive potential of drugs, provides the industry with a host of life-long customers. A much more serious consequence of alcohol and sedative use is **tolerance**, or the need for increasing amounts of a drug to achieve the desired effect. Withdrawal after tolerance has developed runs the risk of *delirium tremens*, a syndrome with an estimated fatality rate of up to 10% if not medically managed [17].

The first synthetic **stimulants** came from research with Ephedra, a plant the Chinese used to treat congestion and fever. In 1887, Romanian chemist Lazăr Edeleanu (1861-1941) extracted **amphetamine** from the Ephedra, but the drug seemed medically useless. In 1932, however, American chemist Gordon Alles (1901-1963) found that the atoms that form the amphetamine molecule are arranged in two different ways, forming two molecules that are mirror images, like right and left hands. The right-hand form (dextro-amphetamine) is a powerful stimulant, while the left-hand form (levo-amphetamine) is much less active. Alles patented his discoveries and later sold the patent to Smith, Kline & French (now GSK) [2, 18].

In 1933, Smith, Kline & French sold a mixture of the two forms of amphetamine as a nasal decongestant in **Benzedrine** inhalers. The company later introduced the right-hand form (dextro-amphetamine) as **Dexadrine**, a drug that was extremely popular with soldiers in World War II. Usage fell after recognition of the drug's addictive potential but at least half a dozen amphetamine preparations, including **Adderal**, are available on prescription [19].

Serotonin reuptake inhibitors (SSIs) have by and large supplanted amphetamines. Serotonin is one of several chemical *neurotransmitters* in the brain that carry signals between nerve cells. The first or transmitting nerve secretes serotonin into the space between it and the next nerve, which is stimulated by the chemical. The measurement of chemicals in the space between cells in the living brain is not yet possible, and mood elevation is *presumed* to be the result of the increased amount and duration of serotonin available to the second nerve [20].

The manufacturer of the first serotonin reuptake inhibitor, fluoxetine (**Prozac**), claims the drug is not addictive—although almost anything can be—and says the symptoms following abrupt withdrawal are not **rebound**, but **relapse**, perhaps to suggest that *depression* is a disease rather than what it is: a symptom that can be the result of many conditions. Regardless of the name, withdrawal from the drug can be difficult, as *there have been spontaneous reports of adverse reactions occurring upon discontinuation of the drugs, particularly when abrupt, including the following: dysphoric mood, irritability, agitation, dizziness, sensory disturbance (e.g., paresthesia such as electric shock sensations), anxiety, confusion,*

headache, lethargy, emotional lability (instability), insomnia, and hypomania. <http://pi.lilly.com/us/prozac.pdf> (para. 5-15, withdrawal).

The words brain and mind are sometimes used interchangeably, but they are not the same thing. The brain is an anatomical organ, like the liver, heart, or stomach, and its anatomy has been known for centuries. Leonardo da Vinci (1452–1519) made detailed drawings of the brain and many areas have the Latin names given in the middle ages (*hippocampus* means *sea horse*). The nerve connections between the brain and the body were traced by three outstanding 19th century physicians, Pierre Paul Broca (1824–1880), Carl Wernicke (1848–1905), and Jean-Martin Charcot (1825–1893). Charcot was the first to distinguish between the *brain* and the *mind*, which is a *function*: what the intact, conscious, and alert brain *does*. MacLean's 20th century proposal is the world's first map of the mind and its disorders [1].

Dr. Charcot was named Professor of Pathological Anatomy at the University of Paris in 1872. He was then responsible for the French asylum for destitute prostitutes, beggars, and insane women, the Salpêtrière. Charcot undertook the first census of the institution and he or a colleague examined every resident and recorded the symptoms of perhaps as many as 5,000 women [21].

The vast amount of clinical data that Charcot recorded eventually made it possible for him to correlate a patient's symptoms with the pathology found in the brain at post mortem. He was eventually able to predict, after physical examination, just what would be found at autopsy. During the next 20 years, Charcot converted what had been a warehouse for unwanted women into what is today one of Europe's great hospitals. By 1890, he was the leading authority on diseases of the brain. Charcot established the world's first neurological clinic in the Salpêtrière and his work, along with that of Broca and Wernicke, is the foundation of the medical specialty neurology [21].

Charcot recognized and recorded the women who were hysteric or certifiably insane (or psychotic) but he also found some superficially *hysterical* women who were excitable, anxious, depressed, obsessive, or manic, but had none of the physical symptoms long believed to be an essential part of the syndrome. At the beginning, he diagnosed these women as *atypical hysterics* but later coined the word *neurosis* to describe them. The APA now lists hysteria as a *conversion reaction* and the constituent symptoms of hysteria as separate neuroses. The management of non-organic or *functional* disorders has become the specialty of psychiatry.

Charcot used hypnotism to relieve the symptoms of hysteria and neurosis. He displayed his technique at his Thursday clinical lectures, which were then open to the public. These clinics were soon so popular that Pierre Andre Brouillet (1857–1914) painted Charcot presenting a

patient to his famous students. The painting is almost life-size, and all of the people in it have been identified. The patient, Marie Blanche Wittmann, is supported by Dr. Joseph Babinski and attended by the Salpêtrière's nursing director, Marguerite Bottard. Dr. Giles de la Tourette is seated in the first row, wearing an apron. Charcot's son, later a famous oceanographer, is standing in front of a window at the rear. The painting hangs in Museum of the History of Medicine in Paris Descartes University [22].

Sigmund Freud graduated from the University of Vienna medical school in 1881 and completed his thesis in 1885. He spent that winter in Paris and attended some of Charcot's Thursday clinics. Freud returned to Vienna in 1886, the year that Robert Louis Stevenson (1850–1894) published *The Strange Case of Dr. Jekyll and Mr. Hyde*. The novel is the story of a London physician who believes every person has a hidden, unconscious, and malevolent side. Dr. Jekyll produces a chemical cocktail intended to reveal this facet in himself. He becomes the evil, self-indulgent, and uncaring Mr. Hyde when he drinks this concoction. The novel was an instant success, followed by stage adaptations in Boston and London within a year [23,24].

Six years later, in 1893, Freud published *Studies on Hysteria*, followed by *The Interpretation of Dreams* in 1900. Over the next few years Freud produced a series of essays in which he intended to explain how the symptoms of hysteria (or *neurosis*) develop. Freud was a prolific and persuasive author; his essays are collectively known as the Structural Theory, which owes a lot to Stevenson, who first published the idea of a malignant unconscious.

According to Freud, an unconscious side of the personality (the *id*) exists and harbors sexual and aggressive impulses towards the parents. The id, under the influence of perceived social mores (the *superego*), develops through specific stages (*oral*, *anal*, and *phallic*) into the personality or self (*ego*). Neurotic disorders are the result of arrest at, or regression to, any of these stages. This is obviously a gross simplification of the Freudian theory, which Kate Cambor has described as *baffling jargon that no one really understands* [25].

Perhaps the first problem with Freud's theory is that he confuses sexual attraction with love. Sexual attraction does not always involve love or, for that matter, even affection. The strongest bonds of love, of a mother for her child, or between soldiers in combat, rarely involves sexual feelings or activity. Caroline Alexander, in a scholarly work on the *Iliad* writes, *the terms that define the relationship between Patroklos and Achilles have no true counterparts in the civilian world but belong to the enduring terminology of war* [5].

Freud cited the story of Oedipus Rex as support for his notion of infantile sexuality, but that is a gross misinterpretation. The tale of Oedipus has nothing to do

with the relationship between a child and its parents. The story is a clear illustration of the classical Greek belief that one's destiny is inevitable. The tale is, in fact, a bit like Agatha Christie's *The Murder of Roger Ackroyd*, in which the investigator turns out to be the culprit [26].

Freud's theories were rejected by both Emil Kraepelin and Paul Eugen Bleuler, two of the leading psychiatrists of the day (see above), and Freud's premises—the idea of oedipal conflict, infantile sexuality, and suppression—have all been debunked. The public, however, was fascinated and Dr. Hill Gates says *the rapid adoption of oedipal explanation into Western popular thought probably owed as much to ethnographic ignorance and prejudice as to the delightful liberation of talking trash at the dinner table* [27,28].

As mentioned at the beginning, Dr. Paul D. MacLean suggested a classification of human mental processes according to three factors: sequence of evolutionary development, degree of sophistication, and sensitivity to drugs. This systematic approach to mental functioning suggests why disorders have traditionally been classified as personality patterns, neuroses, or psychoses (schizophrenias and mood disorders). It also explains why some disorders do not respond to drug treatment, while others are better addressed by psychologists, and it suggests a rational means of distinguishing the disorders which require medical management [1].

The well-known effects of alcohol (or other sedatives) are a good illustration of Dr. MacLean's system. Relatively small amounts of alcohol impair our most *advanced* (and probably unique) functions of intellect, conscious, reason, and judgment. Larger amounts interfere with *intermediate* abilities to which we are clearly predisposed but must learn, such as how to walk and talk. And it explains why drug or alcohol overdose can suppress *basic* operations and be fatal [1].

Dr. MacLean classified heartbeat, respiration, and genetically linked behaviors as *basic*. People are programmed to stand up, walk, learn a language, and also to a range of personal temperaments, including variable degrees of sociability and aggressiveness. MacLean compared this level of mental processing to the abilities of reptiles, and classified it as *proto-reptilian function*. Vital operations and inherent tendencies to sociability, aggression, autism, and addiction, are resistant to drugs but may be altered by participation in group therapy [1].

The ability to learn, store, and recall vast amounts of information is an *intermediate* level of operations roughly comparable to the mental abilities of dogs. People, as an example, are genetically predisposed to speak a language, but language learning requires interaction with native speakers. Along with a language, children acquire the social rules, opinions, and prejudices of the people with

whom they interact. These patterns are inevitably dated, and some are simply wrong, but children accept them without question as reality. This vast amount of information becomes an internal library of subconscious patterns of thinking and behaving [2].

Some of these opinions and prejudices may come into uncomfortable conflict with natural predispositions. This can cause anxiety, panic, depression, and a litany of other symptoms that are best resolved through the development of insight. Dr. MacLean classified this level of mental operations, roughly comparable to the intelligence of our dogs, as *paleo-mammalian* [1].

Consciousness and the awareness of time are clearly the most *advanced*—and probably unique—abilities of the human mind, which Dr. MacLean called *neo-mammalian functions*. It has been suggested that God's cape in Michelangelo's *Creation of Adam* on the Sistine Chapel ceiling has the outline of the human brain and was intended to suggest that consciousness is the final gift of Creation, the ability that makes us fully human [1].

Take heed that you do not place your intellect, which you have in common with the angels, below your senses, which you have in common with brutes and plants. Pope Gregory XI to Holy Roman Emperor Frederick II.

Children begin to be aware of themselves as separate individuals when they are about two years old, and practice saying 'no', but the awareness of time doesn't usually develop until at about age seven, when they are able to consider the consequences of their actions. This stage of development may be marked by a child's first use of future and conditional verb tenses.

The ability to evaluate what we see, say, and hear is a unique human faculty. Impairment of one or more of these senses, in the form of visual or auditory hallucinations, pressured speech, or paucity of speech, is often the outstanding characteristic of what were once called madness or psychosis, and are now discussed as schizophrenias and affective disorders. Perhaps by coincidence, the three wise monkeys on the Toshogu Shrine north of Tokyo—see no evil, speak no evil, and hear no evil—represent these abilities [2].

Three important senses—of taste, touch, and smell—have powerful emotional impact but are rarely involved in functional psychoses; hallucinations involving any of these senses suggest the presence of physical disease. George Gershwin, during a January 1937 concert in Los Angeles, stumbled on an easy passage and later told a friend that he had *experienced a curious odor of some burning smell*. Gershwin consulted a psychiatrist, but died of a brain tumor later that year [29].

The MacLean classification offers guidelines to distinguish between inherent tendencies, neuroses, and psychoses, and suggests which treatment approach is

appropriate in each. Problems that seem to be genetically linked, such as behavioral tendencies, addiction, and autism, are best managed in group therapy. Neuroses that appear to be the result of unacceptable feelings can be blocked by drugs but are best resolved through the resolution of internal conflict through therapy [1,2].

Conclusions

Disorders that impair intellectual abilities—consciousness, vision, hearing, or speech—generally require medical management. The diagnosis should encourage search for causes and to that end should include a detailed history of family. Similar problems in relatives suggest a genetic link. Onset in the early twenties—when there are many social contacts—suggests the possibility of contagion. Environmental contaminants have been implicated and should be investigated in any case of psychosis. If none of these seems likely, this should be noted for further investigation.

Conflict of interest disclosure

There are no known conflicts of interest in the publication of this article.

Compliance with ethical standards

Any aspect of the work covered in this manuscript has been conducted with the ethical approval of all relevant bodies and that such approvals are acknowledged within the manuscript.

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