

Medical and Neuropsychiatric Aspects of Lycanthropy

Miles E. Drake, Jr., M.D.

The metamorphosis of human beings into wolves is well known in mythology, legend, and scripture, and has been extensively surveyed in history, theology, and literature. Werewolf cases have attracted the attention of both ancient and modern physicians, particularly during the development of modern psychiatry and behavioral neurology. Some writers have suggested that lycanthropes suffered from schizophrenia or had intentionally or involuntarily ingested hallucinogens. Hysteria and affective disorder, either mania or intense depression, could also be invoked as causes. Lycanthropy has often been linked with, and sometimes treated by, henbane and nightshade, and its manifestations could be explained in terms of atropinic delirium. Discoloration of teeth and urine, bizarre behavior, nocturnal wandering, and episodic skin and facial changes have suggested a role for porphyria in the werewolf transformation. Through many historical periods and cultures, persons believed to be werewolves have reportedly exhibited alterations in consciousness, depersonalization and derealization, acute anxiety and agitation, preoccupation with demonic possession, and compulsive or perseverative behavior, sometimes of a violent, sexually deviant or impulsive nature. Such features of werewolf behavior might also be explained by ictal and interictal manifestations of complex partial seizures, or as symptoms of the episodic dyscontrol syndrome associated with frontal lobe or limbic system disease or injury. Lycanthropy was often considered a manifestation of demonic possession or a consequence or indication of participation in necromancy. As such, self-proclaimed or suspected werewolves were often persecuted along with other practitioners of the black arts. It is generally believed that such persecution represented the last efflorescence of medieval demonology, but it has also been suggested that clinical description of illnesses of diabolical origin was part of the evolution of Renaissance medicine from the Galenic past toward the scientifically-based future.

Presented in part at the 43rd Annual Meeting, American Academy of Neurology, May 2, 1990. Supported in part by the Denman and Spafford Epilepsy Research Funds, the Ohio State University. Correspondence should be directed to Dr. Miles E. Drake, Jr., 407 Means Hall, 1654 Upham Drive, Columbus, OH 43210.

ORIGINS AND DEVELOPMENT OF LYCANTHROPY

Lycanthropy, the transformation of a human being into a wolf, has an extensive legendary and literary history, and has more recently been the subject of medical inquiry (1). The earlier religious or spiritual descriptions of werewolf manifestations have been supplanted by later explanations in terms of mental disorder, organic brain disease, and toxic or metabolic encephalopathy. Review of the medical, legal, historical, and theological literature concerning lycanthropy suggests that the same causative disorders were described and regarded differently in different social, religious, and scientific climates from antiquity to the present day.

Ancient discussions of wolf transmutation were generally symbolic in nature, and dealt as much with moral as with physical alteration. Odysseus' men were changed by Circe into beasts, and *Ovid's Metamorphoses* records that Lycaon, the savage king of Arcadia, served a dinner of human flesh to Jupiter, and was transformed by the outraged god into an irrational bestial human-wolf corresponding to his moral appetites. An early exception to the ancient tendency toward moralistic accounts may be the *Satyricon* of T. Petronius Arbiter, in which the narrator's host has a sudden impairment of consciousness, removes his clothing, and then displays confused and agitated behavior with a vulpine aspect:

The moon shone as bright as day, and about cockcrowing we fell in with a burying place and certain monuments of the Dead; my man loitered behind me a-stargazing, and I sitting expecting him, fell a-singing and numbering them, when, looking around me, what should I see but mine host stripped stark-naked, and his clothes lying by the highway-side. The sight struck me every where, and I stood as if I had been dead, but he piss'd round his clothes, and of a sudden was turned to a wolf, he set up a howl, and fled to the woods (2).

Early Christian use of the werewolf motif was also in large part symbolic, spiritual, and related to the predations of the Devil among the religious flock. This image appears in the Sermon on the Mount ("Beware of false prophets, which come to you in sheep's clothing, but inwardly they are ravening wolves"), and in the address of Paul to the Ephesians ("after my departing shall grievous wolves enter in among you, not sparing the flock"). The first use of the term "werewolf" in English predates the word "lycanthrope" by several centuries, and is of similar cautionary nature in the Ecclesiastical Ordinances of King Canute:

Therefore must the shepherds be very watchful and diligently crying out, who have to shield the people against the spoiler; such as bishops and mass-priests, who are to preserve and defend their spiritual flocks with wise instructions, that the audacious were-wolf do not too widely devastate, nor bite too many of the spiritual flock (3).

The gradual shift in such descriptions from sudden appearance of wolves to gradual transmogrification of humans emphasizes the role of human weakness in demonic corruption. That human beings might enter such a state not only through satanic involvement but on account of mental aberration and delusions was first suggested in the observations of St. Augustine on physical metamorphosis:

It is very generally believed that by certain witches' spells and the power of the Devil men may be changed into wolves . . . but they do not lose their human reason and understanding, nor are their minds made the intelligence of a mere beast. Now this must be understood in this way: namely, that the Devil creates no new nature, but that he is able to make something appear to be which in reality is not, for by no spell nor evil power can the mind, nay, not even the body corporeally, be changed into the material limbs and features of any animal . . . but a man to himself seems to be a quadruped (4).

As the werewolves of classical antiquity were symbols of moral shortcoming, those of scriptural and ecclesiastical accounts were manifestations of the Devil's power in human affairs. In these medieval accounts, however, a more sympathetic aspect of wolf transformation appears, and many such creatures are depicted as the victims of human malevolence and domestic intrigue. Medieval werewolves are banished from human society, excluded from human fellowship, and barbarized by their solitary existence and obvious deviance. In addition, werewolves from medieval times on are increasingly felt by those around them to be victims of disease.

LYCANTHROPY AND BRAIN DISORDER

Paulus Aegineta, one of the most influential physicians of seventh-century Alexandria, described clinical experiences with werewolves which were widely disseminated in Latin and French translation by the sixteenth century. His seven-volume medical encyclopedia attributes wolf transformation to brain disease and especially epilepsy, humoral pathology, and the use of hallucinogenic drugs. The clinical features include ulcerated legs from traveling on "all fours," excessive thirst, dry and cracked eyes and tongue from diminished or absent tears and saliva, poor vision, pallor, and obsessive nocturnal wandering, especially around cemeteries, and howling until dawn; recommended treatments were baths, purging and venisection, a balanced diet, and application of opium to the nostrils to facilitate sleep. As will be seen, all would be relevant to various neurologic and psychiatric disorders linked to lycanthropy. The writings of Paulus and later authorities were summarized by his nineteenth-century translator, Francis Adams:

All the other authorities give much the same account of this species of melancholy as Paulus . . . Avicenna recommends the application of the actual cautery when the other remedies fail. Haly Abbas describes the disease by the name of *Melancholia canina*. He says the patient delights to wander among tombs, imitating the cries of dogs; that

his colour is pale; his eyes misty, dry, and hollow, his mouth parched; and that he was marks on his limbs of injuries which he has sustained from falls (5).

Medieval werewolf accounts were increasingly attentive to violent, impulsive, or sexually aggressive behavior, and medical and legal authorities remarked upon the presence of mental impairment and possible brain disorder in such wolf-men. Many of the cases described in the fourteenth, fifteenth, and sixteenth centuries have features of the episodic dyscontrol syndrome (6), later associated with frontal lobe and limbic system disease or injury, past clumsiness or minimal brain dysfunction, and a higher-than-expected incidence of seizures, physical assault, pathological intoxication, and sexual aggressiveness and brutality (7). Celebrated cases of this kind may include Jean Grenier, tried in France in 1603 for murder; he was linked to the disappearance of a number of children in the community, whose partially eaten remains were subsequently discovered. Grenier confessed to an uncontrollable appetite for the flesh of young girls, and told the court that he had been transformed into a wolf through the salve and wolfskin he had been given by the Man of the Forest. Remarkably, the court determined that he was mentally deficient, incapable of socialization, and should not be executed for these crimes, but committed him to a monastery for his moral education, where he died at age twenty after an apparent convulsion. The president of the court on this occasion observed that "the change of shape existed only in the disorganized brain of the insane, consequently it was not a crime which could be punished" (8).

One of the most notorious werewolves was Stubbe Peeter, who allegedly committed many brutal crimes in Germany during the twenty-five years after a fall, perhaps with head injury, which reportedly changed his character. He was executed after a celebrated trial, described in a widely-circulated pamphlet, in which he confessed to committing incest with his daughter and sister, murdering his son, attacking humans and animals and eating their flesh raw, and widespread adultery, in the furtherance of which acts he had made use of a girdle given him by the Devil, which transformed him into a wolf (8). A farmer in Alkmaar, Holland, was reported at about this time to have developed a pattern of skulking about churchyards and hiding behind gravestones after his recovery from a febrile illness, perhaps encephalitis, his aspect being "black, ugly, and fearful" (9). The French physician Jacques Ferrand reported a patient with episodes of unresponsiveness and erotomanic transport, whose attacks may be interpreted as epilepsy and who at those times resembled a wolf (10).

Neurologic historians may well be interested in the report of Henri Bouget, a sixteenth century jurist who specialized in trials involving possession and transformation: Bouget noted the occasional appearance of cats instead of wolves in some cases, describing in detail the experiences

of one Charcot of the bailiwick of Gez, who could ward off the attacks of such cats by making the sign of the Cross (11). It is not known whether this represents an ancestor of the later Charcot who, it may be argued, repeated the maneuver in his dramatic reversal of hysterical symptoms by hypnosis.

LYCANTHROPY AND MENTAL DISORDER

The first discussion of “lycanthropy” in English was in Reginald Scot’s “The Discoverie of Witchcraft” in 1584. In attempting to free lycanthropes from opprobrium and persecution, the Kentish chemist and agriculturalist invoked humoral theories of mental illness which presaged modern biochemical understanding of depression and psychosis:

This melancholike humor (as the best physicians affirm) is the cause of all their strange, impossible, and incredible confessions . . . these affections, though they appeared in mind of man, yet are they bred in the body, and proceed from this humor (12).

“Melancholy” had at first been one of the fundamental humors determining character, and involved in physical and mental health, but it came also to represent the pathological state of mood aberration. Lycanthropy was widely held to represent an excess of melancholy, and Aetius in the fifth century and later Garzoni in a text on “incurable fooles” reported that

Among the humours of melancholy, the physicians place a kind of madness by the Greeks called *Lycanthropia*, termed by the latins *insania lupina*, or wolves furie: which bringeth a man to this point . . . that in Februarie he will goe out of the house in the night like a wolf, hunting about the graves of the dead with great howling, and pluck the dead mens bones out of the sepulchers, carrying them about the streets to the great fear and astonishment of all them that meet him . . . melancholike persons of this kinde, have pale faces, soaked and hollow eyes, with a weak sight, never shedding one tear to the view of the world, a dry tongue, extreme thirst, and they want spittle and moisture exceedingly (13).

Such reports suggest a prominence of skin, ocular, and mucous membrane changes in werewolves, which may relate to later discussions of other disorders, but the major importance of Scot’s discussion of lycanthropy is the suggestion that dramatic alterations in behavior and consciousness, even prolonged amnesic or dissociative periods, could be the result of affective disturbance:

Melancholie abounding in their head, and occupieing their brane, hath deprived or rather depraved their judgements, and all their senses . . . the force which melancholie hath, and the effects that it worketh in the bodie are almost incredible. For as some of these melancholike persons imagine, they are . . . brute beasts Through melancholie they were alienated from themselves . . . they may imagine, that they can transforme their owne bodies, which nevertheless remaineth in the former shape (13).

Scot's observations would be consistent with delusional depression, with manic exaltation and perceptual alteration, or with dissociative reactions. All could coexist with affective disorder as presently defined, and this was predicted both with regard to mental disorder generally and as a prominent cause of lycanthropy particularly, by Robert Burton in *The Anatomy of Melancholy*:

Madness, phrenzy, and melancholy, are confounded by Celsus and many writers . . . Galen himself writes promiscuously of them both by reasons of their affinity . . . Of this fury there be divers kinds; ecstasy, which is familiar with some persons . . . in which the Indian priests deliver their oracles, and the witches in Lapland . . . The other species of this fury are enthusiasms, revelations, and visions, so often mentioned by Gregory and Bede in their works; obsession or possession of devils, Sibylline Prophets, and Poetical furies . . . the most known are these, Lycanthropia, Hydrophobia, Chorus sancti viti.

Lycanthropia, which Avicenna calls *Cucubuth* and others *Lupinam insaniam* or Wolf-madness, when men run howling about graves and fields in the night, and will not be persuaded but that they are wolves, or some such beasts. Aetius and Paulus call it a kind of Melancholy, but I should rather refer it to madness (13).

Other mental disorders have more recently been invoked as causes of lycanthropy, most notably schizophrenia. Surawicz and Banta (14) reported two cases, one a manifestation of chronic paranoid schizophrenia and the other an undiagnosed chronic brain syndrome with episodic symptoms, right frontal EEG and brain scan abnormality, evidence of right hemisphere dysfunction on neuropsychological testing, and findings on craniotomy and brain biopsy of cortical atrophy and glial scarring. The possibility of epilepsy was considered, although antiepileptic drugs were apparently not given and seizures were not clearly documented, and the case also accords with reports of dissociative states, demonic possession, and delusions of transformation and metamorphosis accompanying nondominant hemisphere disease and EEG abnormality with and without epilepsy (15). Their second patient, like many lycanthropes, experienced symptomatic exacerbation with lunar cycles, a complaint common among epileptics as well, but one which has not been substantiated by detailed study, and for which no organic explanation can yet be given (16). The lycanthropic symptoms of their first schizophrenic patient were felt to be aggravated by use of hallucinogenic drugs, as was also the case of a pseudoneurotic schizophrenic studied by Rosenstock and Vincent (17). The latter authors noted that their patient, like lycanthropes past, exhibited symptoms of depersonalization, altered consciousness, anxiety, and obsessive and compulsive thinking, which have been linked to psychomotor epilepsy but are not necessarily characteristic of it.

LYCANTHROPY AND DRUG INTOXICATION

The French medieval historian Goulart sought in 1607 to differentiate individual cases of lycanthropy from mass manifestations of sadomasochistic lycanthropic rites. The former he felt to be "madmen in whom the Melancholike humor doth so rule, that they imagine themselves to be changed into wolves" (18), while the latter involved a trance-like state after which participants in the rites believed themselves under diabolical influence, and could have been due to mass hysteria or intoxication. Intoxication has frequently been suggested by the accounts of biblical and classical antiquity, as well as later medical and theological descriptions epitomized by such reports as Robert Bayfield's summary of a patient repeatedly improved with a purgative, vomitive, and drawing of "blood black like soot" (19). Burton ascribed some causes of lycanthropy to "taking henbane, nightshade, wine, & c," and Della Porta reported observations of lycanthropy after ingestion of "Stramonium, Solanum manicum, Bella Donna; neither did he exclude Henbane from among his Ingredients: extracting their essences by their Menstruum, and mix'd some of their Brain, Hart, Limbs, and other parts with them" (20).

Many lycanthropes confessed to using a drug or ointment of the above type, or were allegedly given such by a demonic interlocutor. Drugs used for medicinal purposes, particularly in individuals with pre-existing neurologic disorder, could also have had this effect. The most common base for this and other ointments of the day was boiled, congealed fat; in the case of werewolf transformation the fat used was supposedly that of an unbaptized dead infant. This could facilitate skin penetration by hallucinogenic substances, which herbalists of the day warned against gathering with even the slightest abrasion on the skin, for fear of intoxication and delirium. Henbane (*Hyoscyamus niger*) consists of hyoscyamine atropine and hyoscyne (scopolamine), and was recommended by such ancients as Dioscorides and Celsus and subsequent herbalists like Gerard and Culpeper for rheumatic pain, toothache, and insomnia. Convulsions, delirium, and delusional psychosis were early recognized with its overuse, as with the more potent belladonna and stramonium. Nightshade (*Atropa belladonna*) was recommended by Dioscorides for "St. Anthonies fire, the shingle, paine of the head . . . and other like accidents proceeding of sharp and biting humours" (21), while Gerard cautioned that "it causeth sleep, troubleth the minde, bringeth madness if a few of the berries be inwardly taken" (22), and argued that it was too toxic even for drastic treatment of advanced mental disorders. Other writers have advocated giving lycanthropes wormwood, containing the psychotomimetic thujone, which was later to be implicated in the illness of van Gogh, mandrake, a narcotic containing hyoscyamine

plus scopolamine, and atropine, and the serotonergic hallucinogens cohoba and peyote. Such treatment could have precipitated further episodes, and may have been aided in this regard by the adjunctive therapies of bloodletting, purgation and vomiting to the point of faintness, and dietary alterations likely to have altered fluid and electrolyte balance.

PORPHYRIA AND LYCANTHROPY

The remarkable similarity of physiognomy between werewolves and advanced cases of porphyria was pointed out a quarter-century ago by Illis (23). The disorder is characterized by photosensitivity, discoloration of the urine by porphyrins, ulcerating skin lesions with progressive mutilation of fingers, eyelids, ears, and nose, hyperpigmentation of photosensitive areas, red teeth due to porphyrin deposition, and chronic hemolytic anemia with splenomegaly. Brownish discoloration of the skin, violaceous pigmentation of the face, and marked conjunctival injection are associated with porphyria cutanea tarda, and intense pruritis and excoriation of exposed areas, hirsutism, and jaundice may occur. These potentially dramatic and frightening physical features may, more often in acute intermittent porphyria but occasionally in porphyria cutanea tarda, be associated with delirium, psychosis, and seizures. A geographic predilection for northern and central Europe, and a further tendency to cluster in certain valleys and mountainous areas, is consistent with the reported geographical predilection of lycanthropy, and perhaps also with the climatic variation described by Burton and others:

This malady, saith Avicenna, troubleth men most in February, and is nowadays frequent in Bohemia and Hungary, according to Heurnius . . . They lie hid most part all day, and go abroad in the night, barking, howling at graves and deserts; they have usually hollow eyes, scabbed legs and thighs, very dry and pale, saith Altomarus . . . (12).

It is possible to explain many aspects of lycanthropy on the basis of porphyria, and it is again possible, as with mental disorder, that attempts to treat the porphyric manifestations with herbal remedies could have toxic results. The relatively constant occurrence of recessive congenital porphyria and dominant porphyria cutanea tarda would not explain the increasing recognition and changing behavioral manifestations of werewolf transformation, however, which came over time to have an increasing association with violent and uncontrolled actions and psychotic thoughts.

LYCANTHROPY AND DEMONIC POSSESSION

Lycanthropy ought to have been less often associated in medical circles and perhaps among laymen with suspicions of diabolism after the arrival of the Renaissance and an increase in the pace of scientific and medical development. In fact, some of the most intense persecution of lycanthropes, witches, and other demonic malefactors came after the decline of medieval science and medicine. The *Malleus Maleficarum* of the Dominican demonologists Heinrich Kramer and Johannes Springer was revised eight times between 1486 and 1600, and taught that "Satan can, by the permissive will of God, move the inner perceptions and humours, effect changes in the actions and faculties, physical, mental, and emotional, working by means of any physical organ soever." Transformation could be accomplished by two means: the Devil, through imagination or dream, creates the illusion of metamorphosis in susceptible humans, or else enters into actual wolves and makes them ravenous and destructive. Little could be done about the latter cause, as wolves, even possessed ones, were not easily captured or studied; the former mechanism emphasized the potential power of the demonic in human activity, and rendered the detection of lycanthropes, as of witches and sorcerers, vital. This influential volume and the writings derived from it provided the theological and legal underpinning of much subsequent prosecution and persecution of suspected diabolism. It was until recently widely felt that witch trials, including persecution of lycanthropes, were the result of such beliefs, derived from the Middle Ages, and that the celebrated craze of witch-hunting and witch-burning in seventeenth-century Europe and America was a last stand of medieval recidivism.

The closest clinical associations of lycanthropy with apparent mental aberration and possible neurobehavioral disorder, and the most intense medicolegal preoccupation with the supernatural, date interestingly and paradoxically from precisely the time in which ancient and medieval Galenic medicine was being superceded by the beginnings of modern clinical and physiological inquiry. The witch craze and the "new science" flourished together in Europe and colonial America, perhaps because the decline of traditional medical systems and diagnostic categories together with enhanced clinical scrutiny of individual patients and their illnesses led to the proliferation of cases not explicable or treatable by even the expanding knowledge of the times. Although medicine was bringing some conditions previously thought to be of supernatural origin under physical therapy, sometimes with beneficial effect and sometimes not, the replacement of historical medical methods with new systems then under way required that some explanation be elaborated for diseases not able to be

compassed by existing nosology. It was frequently suggested that, while diabolical influences could obviously affect physical illness, the true demonic illnesses were those of obscure origin, anomalous presentation, and poor response to treatment. The English physician John Cotta argued that supernatural pathogenesis was to be suspected "when natural remedies or means according unto art and due discretion applied, do extraordinarily or miraculously either lose their manifest inevitable nature, use, and operation, or else produce effects and consequences, against or above their nature." (24) Leland Estes suggested that the reintroduction by Jean Fernel of Aristotelian epistemology into medicine facilitated the identification of a class of anomalous disorders of demonic origin:

The increasing attention that the medical profession was paying to specific pathological states, linked with the inability of medical theory to change or expand fast enough to provide adequate explanations for all of the new facts that were emerging, meant that the individual physician would certainly encounter many ailments whose symptomatology was so irregular that he could not offer an intelligible remedy . . . Fernel argued, and most physicians for the next century followed him in this . . . that such diseases had an unusual or supernatural cause (25).

These observations could explain how the witch craze of the sixteenth and seventeenth centuries could flourish in a time of scientific advancement and improved and more widespread education. The notion that judicial pursuit of demonic influences was a manifestation of scientifically-informed policy influenced by rationality rather than a recrudescence of medieval superstition could also explain why witch-hunting was more prominent and long-lasting in America and Northern Europe than in areas influenced by the Inquisition, Orthodoxy or Islam. This view of the genesis of witch-hunting would also suggest that such imputations of diabolical involvement might first and most prominently involve those disorders of brain function and behavior of which little was known then and in which areas advances have come later than in other medical fields. Some accounts of these proceedings have suggested that, although some indictments of suspected witches focused on plagues and other common illnesses, most such conditions were still generally held to be of physical origin. John Gaule, a critic of the witch hunts, pointed out that "every disease whereof they neither understand the cause, nor are acquainted with the symptoms must be suspected for witchcraft" (26).

Lycanthropy and other types of possession and transformation may thus have been in some cases the precursors of nervous exhaustion, dementia precox, and chronic fatigue syndrome, "wastebasket diagnoses" in the nosology of the day. The enduring werewolf myth, like many other "symbolic images of the life of the psyche" considered by Auden, probably has physical, historical, and cultural underpinnings, of which neurologic dis-

order, psychiatric illness, and the effects of medicines and substances are but a few. With Auden, we might conclude that “no one conscious analysis can exhaust its meaning. There is no harm, however, if this is realized, in trying to give one” (27).

REFERENCE NOTES

1. Otten CF: *A Lycanthropy Reader: Werewolves in Western Culture*. 1986; Syracuse, Syracuse University Press.
2. Arbiter TP: *The Satyricon of Petronius* (trans. 1694, William Burnaby). 1910; London, Norman Lindsay.
3. Thorpe B (ed): *Ancient Laws and Institutes of England*. 1840, London, pp. 160-161.
4. St. Augustine: *De Spiritu et Anima*, ch. 26; *De Civitate Dei*, lib. 18, ch. 17.
5. Adams F (ed.): *The Seven Books of Paulus Aegineta*. 1847, London, Vol. III, Sec. XVI.
6. Mark VH, Ervin FR: *Violence and The Brain*. 1970; New York, Harper & Row.
7. Elliott FA: The episodic dyscontrol syndrome and aggression. *Neurol Clin* 1984; 2:113-129.
8. Bar-Gould S: *The Book of Were-wolves*. 1865; London, Smith Elder & Co., pp. 85-98.
9. Remy N: *Daemonolatria*. in, Ashwin EA (trans): *An Examen of Witches*. 1929, London, John Rodker.
10. Boguet H: *On the metamorphosis of men into beasts*. in, Ashwin EA (trans): *An Examen of Witches*. 1929, London, John Rodker.
11. Scot A: *The Discoverie of Witchcraft* (ed. H. Ross Williamson). Arundel, Centaur Press.
12. Garzoni T: *Hospitall of Incurable Fooles*. 1600, London, p. 19.
13. Burton R: *Anatomy of Melancholy*. (ed. AR Shilleto) 1912, London, Bell, Vol. I, p. 160-164.
14. Surawicz FG, Banta R: Lycanthropy revisited. *Can Psych Assoc J*, 1975; 20:537-542.
15. Drake ME, Pakalnis A, Denio LC: Differential diagnosis of epilepsy and multiple personality: Clinical and EEG findings in 15 cases. *Neuropsychiat Neuropsychol Behav Neurol* 1988; 1:131-140.
16. Drake ME: By the light of the silvery moon: Lunar influences on epilepsy. *Neurology* 1988; 38 (Suppl 1): 383-384.
17. Gosenstock HA, Vincent KR: *A case of lycanthropy*. *Am J Psychiat*, 1977; 134:1147-1149.
18. Goulart J: *Admirable and Memorable Histories*. (ed. E. Grimeston) 1607; London, pp. 386-392.
19. Bayfield R: *De Morborum Capitis Essentiis et Prognosticis*, 1663; London, pp. 49-51.
20. della Porta G: *Natural Magick*. (ed. DJ Price) 1957; New York, Basic, pp. 219-220.
21. Grieve M: *A Modern Herbal*. 1971; New York, Dover, pp. 397-404.
22. Gerard J: *The Herball, enlarged and amended by Thomas Johnson*. 1636; London, pp. 337-341, 582-591.
23. Illis L: *On porphyria and the aetiology of werewolves*. *Proc Royal Soc Med* 1964; 57:23-26.
24. Cotta J: *A Trial of Witch-craft*. 1616, London, P. 70.
25. Estes LL: The medical origins of the European witch craze: a hypothesis. *J Social History* 1983; 17:271-284.
26. Gaule J: *Select Cases of Conscience Touching Witches and Witchcrafts*. 1646, London, p. 85.
27. Auden WH: *Forewords and Afterwords*. 1974; New York, Vintage, p. 203.