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The Role of Psychotic Disorders in Religious History Considered

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Abstract

The authors have analyzed the religious figures Abraham, Moses, Jesus, and St. Paul from a behavioral, neurologic, and neuropsychiatric perspective to determine whether new insights can be achieved about the nature of their revelations. Analysis reveals that these individuals had experiences that resemble those now defined as psychotic symptoms, suggesting that their experiences may have been manifestations of primary or mood disorder-associated psychotic disorders. The rationale for this proposal is discussed in each case with a differential diagnosis. Limitations inherent to a retrospective diagnostic examination are assessed. Social models of psychopathology and group dynamics are proposed as explanations for how followers were attracted and new belief systems emerged and were perpetuated. The authors suggest a new DSM diagnostic subcategory as a way to distinguish this type of psychiatric presentation. These findings support the possibility that persons with primary and mood disorder-associated psychotic symptoms have had a monumental influence on the shaping of Western civilization. It is hoped that these findings will translate into increased compassion and understanding for persons living with mental illness.

A man in his late 20s with paranoid schizophrenia explained during a neurological evaluation that he could read minds and that for years he had heard voices revealing things about friends and strangers alike. He believed he was selected by God to provide guidance for mankind. Antipsychotic medications prescribed by his psychiatrists diminished these abilities and reduced the voices, and therefore he would not take them. He asked, “How do *you* know the voices aren’t real?” “How do you know I am not The Messiah?” He affirmed, “God and angels talked to people in the Bible.”

Later, we reflected on what he had said. He raised poignant questions that are rarely discussed in academic medicine. Every day, physicians, nurses, psychologists, and social workers alike encounter and care for people who experience psychotic symptoms. About 1% of emergency room visits and 0.5% of all primary care visits in the United States are related to psychotic symptoms.[1,2] As many as 60% of those with schizophrenia have religious grandiose delusions consisting of believing they are a saint, God, the devil, a prophet, Jesus, or some other important person.[3] Diminished insight about having a mental disorder is part and parcel of the condition, occurring in 30%–50% of persons with schizophrenia.[4] How do we explain to our patients that their psychotic

symptoms are not supernatural intimations when our civilization recognizes similar phenomena in revered religious figures? On what basis do we distinguish between the experiences of psychiatric patients and those of religious figures in history?

A review of the medical literature revealed little discussion of these specific issues utilizing modern neuropsychiatric and behavioral neurologic principles. An examination of the revelation experiences of prominent religious figures was needed to determine whether new insights could be achieved about their nature through the application of neuropsychiatric and behavioral neurologic principles. We undertook this examination with the intent of promoting scholarly dialogue about the rational limits of human experience and to educate persons living with mental illness, healthcare providers, and the general public that persons with psychotic symptoms may have had a considerable influence on the development of Western civilization. The selection of personalities for analysis was based on 1) the existence of narratives recounting the individual's mystical experiences and behaviors; 2) the potential similarity of these experiences to psychiatric phenomena; 3) the high degree of impact their life stories had on Western civilization in terms of influencing themes found in literature and art, religious thought and practice, philosophy, concepts of social order, and jurisprudence. The following is a retrospective diagnostic examination of Abraham, Moses, Jesus, and St Paul. It is hoped that this investigation will help translate the veneration, love, and devotion felt by many for these religious figures into increased compassion and understanding for persons with mental illness.

Abraham

The Bible is the earliest source of information about the life of Abraham, the patriarch of Judaism, Christianity, and Islam. The historical existence of Abraham is the subject of some academic controversy. Our discussion will proceed on the premise that he was a historical figure. The events occurring during his lifetime are generally thought to have taken place sometime between 2000 BCE and 1630 BCE, but this is a subject of some debate. He is described as having had interactive mystical experiences of an auditory and visual nature (see Figure 1), that influenced his behaviors throughout most of his life (see Table 1). This phenomenology closely resembles that described in the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV-TR).[5] Applying the DSM-IV-TR paradigm, Abraham's auditory and visual perceptual experiences and behaviors could be understood as auditory hallucinations (AH), visual hallucinations (VH), delusions with religious content, and paranoid-type (schizophrenia subtype) thought content (see Table 1 for examples). These psychiatric features occur together as a constellation in psychotic disorders of both primary psychiatric origin and secondary to medical and neurological conditions.[5] According to the DSM-IV-TR, the diagnosis of schizophrenia requires at least two out of five symptoms from Criterion A and then fulfillment of the five remaining criteria (see Table 2). Criterion A might theoretically be fulfilled by the presence of his auditory and visual perceptual experiences. Abraham is not recounted as having had symptoms that can now be appreciated as disorganization, catatonia, negative psychiatric symptoms (affective flattening, alogia, or avolition), or cognitive difficulties such as impaired concentration, attention, or memory. The lack of detailed information about his life prevents us from understanding whether he experienced a decline in social or occupational functioning, as compared with the period before the onset of his perceptual experiences, as required by Criterion B. Criterion C's requirement about persistence and duration of symptoms is fulfilled by the period of 100 years or more during which he had these experiences. His generally good state of health is indicated by a purported lifespan of 175 years without mentioned infirmity. Abraham appeared not to suffer from debilitating depressive- or manic-like

symptoms, thereby diminishing the likelihood of mood disorder associated psychoses, such as depression with psychotic features, bipolar disorder, or schizoaffective disorder.

FIGURE 1. Abraham Being Stopped From Sacrificing His Son Isaac by a Vision of an Angel (Genesis 22:9–12)

Laurent de la Hyre: Abraham Sacrificing Isaac (c1650), Musée Saint-Denis, Reims, France

TABLE 1. Selected Examples of Passages With Features Resembling Psychiatric Phenomena

Abraham
Auditory and visual hallucinations[a]: Genesis 12:1–3; 12:7; 13:14; 15:1–11; 17:1–21;22:1–2; 22:11–12 (Figure 1)
Paranoid Type (PS subtype) thought processes[b]: Genesis 12:3 (implies a very Abraham-centered worldview of dispensing universal blessings and curses based on one's interactions with Abraham); 12:11–13; 14:22; 17:14; 20:11; 21:11–14 (potential mistrust, as seen by the sending-away of his first-born son to eliminate competition for his second son); 23:4 (He referred to

EXPAND TABLE

a Hallucinations in PS are typically related to the themes of delusions.[5]

b Paranoid-type (PS subtype) thought content: Delusions are typically persecutory or grandiose or both. Delusions with other themes, such as jealousy, religiosity, or somatization may also occur. They are usually organized around a theme.[5]

All biblical references are from The New Oxford Annotated Bible with the Apocrypha, Revised Standard Version. Edited by May HG, Metzger BM, New York, Oxford University Press, 1977.

TABLE 2. Diagnostic Criteria for Schizophrenia

A. Characteristic symptoms: Two or more of the following, each present for much of the time during a 1-month period (or less, if symptoms remitted with treatment).

Delusions
Hallucinations

EXPAND TABLE

Adapted from the *Diagnostic and Statistical Manual of Mental Disorders, 4th Edition, Text Revision*. Washington, DC, American Psychiatric Association, 2000, pp 297–343.

Other potential causes of such experiences need to be explored. The ingestion of hallucinogenic substances is known to produce mystical experiences. There has been speculation that plants with psychoactive properties were valued by the ancient Israelites, but no direct evidence has been uncovered for their actual use for inducing mystical experiences in this population.[6] Another possibility would be that of epilepsy-induced mystical experiences. Persons with epilepsy may experience ictal, postictal, or interictal schizophrenia-like symptoms, which can be indistinguishable from primary psychotic disorders[7,8] and occur in roughly 2%–7% of persons with epilepsy;[9] 2.2% of temporal lobe-onset seizures may be associated with religious experiences.[10,11]

Grandiose and messianic-type delusions are recognized as occurring in association with complex partial seizure disorders.[12] Published cases show ictal religious experiences to be awe-inspiring or ecstatic, but generally not successful in imparting detailed or complex information.[10,13–17] Postictal psychosis (PIP) is more common and tends to occur in close proximity to seizure clusters and can also be associated with a recent exacerbation in seizure frequency.[18] It is estimated to account for a quarter of psychosis in epilepsy[19,20] and occurs in up to 18% of medically intractable focal epilepsy patients.[21,22] Of persons with PIP, up to 25% may have religious delusions.

Only 2% of those who go on to have interictal psychosis have religious delusions.[23,24] Interictal psychosis is otherwise not readily distinguishable from schizophrenia, but may manifest preservation of affect, fewer negative symptoms, and, arguably, greater insight. The greater similarities may lay in positive symptomatology; that is, that of thought disorder, delusions, and hallucinations.[7] Reliable prevalence data are lacking, but it has been proposed that between 30% and 60% of patients with partial seizures will also have secondary generalized seizures.[25–27]

Abraham is not recounted as having had any infirmities that might resemble the phenomena we now commonly understand to accompany seizures. Specifically, there are no signs of repetitive behaviors, such as uncontrolled generalized or partial shaking, orofacial automatisms, stereotyped behavioral changes, recurrent and consistent auras of fear (although fear did accompany some episodes), staring spells, loss of consciousness, falling spells, tongue-biting, or incontinence. His ability to engage in varied dialogue with his hallucinations would not be very typical of an ictal perceptual change, since seizures tend toward being stereotyped in nature and not to be so changeable and interactive.[10,13–17,28,29] Most generalized seizures, and, often, complex partial seizures, are associated with amnesia for the period during and immediately after a seizure, and persons often have baseline day-to-day cognitive impairments in memory and executive domains.[30,31] There are no indications that Abraham experienced uncontrolled motor events, amnestic periods,

or cognitive impairments of any kind. A postictal or interictal psychotic state cannot be excluded, but is not particularly suggested on the basis of the available information.

The absence of apparent affective, medical, or neurological conditions increases the possibility that a psychotic disorder could have been present. Schizophrenia is often accompanied by both disorganized behavior and thought processes that interfere with life functioning.[5] In the case of Abraham and in the others that follow, disorganization and cognitive impairments are not apparent. Paranoid schizophrenia (PS), however, is a subtype of schizophrenia that tends to manifest little or no disorganization, has preserved functional affect, and is associated with better occupational and social functioning.[5]

Psychotic disorder, not otherwise specified (PD NOS) is another reasonable diagnostic alternative. PD NOS includes those persons with psychotic symptomatology for which there is inadequate or contradictory information or symptoms that do not meet criteria for any specific psychotic disorder.[5] Abraham's clinical profile would appear to best resemble that of PS or PD NOS, and perhaps, less likely, an affective disorder-related psychosis. Abraham stands as the earliest case of a possible psychotic disorder in literature.

Moses

The story of Moses in the Bible is thought to have its setting sometime between 1550 BCE and 1200 BCE.[32] The stories about Moses include a great deal of information about his background, life functioning, beliefs, actions, and perceptual experiences (see Figure 2). Moses had perceptual experiences and behaviors that find closest parallel today with the DSM-IV-TR–defined phenomena of command AHs, VHs, hyperreligiosity, grandiosity, delusions, paranoia, referential thinking, and phobia (about people viewing his face). (See Table 3 for examples.) Many of these features may occur together in schizophrenia, affective disorders, and schizoaffective disorder.[5] Moses also did not appear to have any disorganization, catatonia, or negative psychiatric symptoms, or difficulties with concentration, attention, and memory (see Table 2). Criterion A for schizophrenia could theoretically be fulfilled by his experiences that resemble delusions and hallucinations. In fulfillment of Criterion B, Moses' social and occupational functioning could be said to have declined from that of a presumably educated member of the Egyptian royal family to having fled Egyptian society to become a shepherd working on the periphery of the desert in a foreign land (Exodus 2:15–22). His flight from Egypt occurred before the onset of AH and VH, thereby suggesting a prodromal decline in functioning before the onset of psychosis. A prodrome refers to the early symptoms and signs of an illness that precede the characteristic manifestations of the acute, fully developed illness. A prodromal period may precede the onset of schizophrenia by months to up to 10 years in 70% of patients[33] and up to 20 years in some cases.[34] The period over which Moses had these experiences was in excess of 40 years, fulfilling Criterion C. His social functioning and leadership skills were sufficiently intact to have made it less likely that he had periods of debilitating major depression or florid mania that might have undermined his effectiveness as a leader. This could fulfill Criterion D by reducing the likelihood of mood disorder-associated psychosis. It should be noted that the religious writings attributed to Moses' authorship, the Pentateuch, could suggest the presence of an exaggerated urge to write. Such hypergraphia is a nonspecific finding more commonly associated with mania, hypomania, or mixed states; however, it is also a feature of schizophrenia and temporal lobe epilepsy.[35–37] Trimble writes that the hypergraphic output of schizophrenic and epileptic patients is rarely creative. They are often loosely mystical, and both perseverative and vague in content.[37] In contrast to the relative paucity of poets with schizophrenia

or epilepsy, he observes that the number of poets suggested to have mood disorders are represented in far greater numbers.[37] Therefore, mood disorder-associated psychoses remain quite viable in the case of Moses.

FIGURE 2. Moses' Vision of the Burning Bush (Exodus 3:2)

Moses Before The Burning Bush (1613–14) By Domenico Feti, at Kunsthistorisches Museum, Vienna, Austria

TABLE 3. Clinical Signs and Symptoms of Schizophrenia

	Religious Figures			
Behaviors Resembling	**Abraham**	**Moses**	**Jesus**	**St Paul**
Auditory hallucinations	+	+	+	+
Visual hallucinations	+	+	+	+

EXPAND TABLE

+: present; —: not present; I: inconclusive evidence or unknown.

There is no indication in the Bible that Moses experienced metabolic dysregulations or that he used hallucinogenic intoxicants as an explanation for his behavioral or perceptual changes. There are also no key features, as previously mentioned, to implicate epilepsy as a cause of mystical experiences. He lived a long life, in excess of 100 years, arguing against the presence of progressive medical or neurological illnesses. The criteria for diagnosis of PS would be fulfilled by the predominance of delusions and hallucinations in the absence of disorganization, negative psychiatric symptoms, or cognitive impairment.

An increased propensity for violence has been observed in some individuals with PS.[38] Moses' increased propensity for violence could be viewed as corroborative for a diagnosis of PS. Reasonable diagnostic alternatives might include PD NOS, bipolar disorder, and schizoaffective disorder. If the first five books of the bible are credited to Moses' authorship, then a bipolar disorder or perhaps schizoaffective disorder would be more compatible with his writing abilities.

Jesus

Jesus is the foundation figure of Christianity, who is thought to have lived between 7–2 BCE and 26–36 CE. The New Testament (NT) recalls Jesus as having experienced and shown behavior closely resembling the DSM-IV-TR–defined phenomena of AHs, VHs, delusions, referential thinking (see Figure 3), paranoid-type (PS subtype) thought content, and hyperreligiosity (see Table 1). He also did not appear to have signs or symptoms of disorganization, negative psychiatric symptoms, cognitive impairment, or debilitating mood disorder symptoms. NT accounts about Jesus mention no infirmity. In terms of potential causes of perceptual and behavioral changes, it might be asked whether starvation and metabolic derangements were present. The hallucinatory-like experiences that Jesus had in the desert while he fasted for 40 days (Luke 4:1–13) may have been induced by starvation and metabolic derangements. Arguing against these as explanations for all of his experiences would be that he had mystical or revelation experiences preceding his fasting in the desert and then during the period afterward. During these periods, there is no suggestion of starvation or metabolic

derangement. If anything, the stories about Jesus and his followers suggest that they ate relatively well, as compared with the followers of his contemporary, John the Baptist (Luke 7:33–34). Epilepsy-associated psychotic symptoms are possible, but Jesus is not recounted as having any of the previously-mentioned common hallmarks of epilepsy. A decline in his occupational and social functioning cannot be established because of a lack of sufficient information. His experiences appear to have occurred over the course of at least the year before his death. The absence of physical maladies or apparent epilepsy leaves primary psychiatric etiologies as more plausible. As seen with the previous cases, Jesus' experiences can be potentially conceptualized within the framework of PS or psychosis NOS. Other reasonable possibilities might include bipolar and schizoaffective disorders.

FIGURE 3. The Boat That Held Jesus and His Followers Before Jesus Bid the Storm to Subside (Mark 4:38–40)

Storm on the Sea of Galilee By Rembrandt van Rijn (1633; whereabouts unknown since the Isabella Stewart Gardner Museum robbery in 1990)

There is a 5%–10% lifetime risk of suicide in persons with schizophrenia.[39] Suicide is defined as a self-inflicted death with evidence of an intention to end one's life. The NT recounts Jesus' awareness that people intended to kill him and his taking steps to avoid peril until the time at which he permitted his apprehension. In advance, he explained to his followers the necessity of his death as prelude for his return (Matthew 16:21–28; Mark 8:31; John 16:16–28). If this occurred in the manner described, then Jesus appears to have deliberately placed himself in circumstances wherein he anticipated his execution. Although schizophrenia is associated with an increased risk of suicide, this would not be a typical case. The more common mood-disorder accompaniments of suicide, such as depression, hopelessness, and social isolation, were not present,[40] but other risk factors, such as age and male gender, were present. Suicide-by-proxy is described as "any incident in which a suicidal individual causes his or her death to be carried out by another person."[41,42] There is a potential parallel of Jesus' beliefs and behavior leading up to his death to that of one who premeditates a form of suicide-by-proxy.

St. Paul (Saul of Tarsus)

St. Paul lived during the first century CE. It has been speculated that his religious experiences resulted from temporal lobe epilepsy.[43] We would argue that it is not necessary to invoke epilepsy as an explanation for these experiences. St Paul's mood in his letters ranged from ecstatic to tears of sorrow, suggesting marked mood swings.[44,45] He endorsed an abundance of sublime auditory and visual perceptual experiences (2 Corinthians 12:2–9) that resemble grandiose hallucinations with delusional thought content. He manifested increased religiosity and fears of evil spirits, which resembles paranoia. These features may occur together, in association with primary and mood disorder-associated psychotic conditions.

In 2 Corinthians 12:7, St Paul relates "a thorn was given me in the flesh, a messenger from Satan, to harass me, to keep me from being too elated." This thorn has been speculated to be a reference to epilepsy.[43] Other theories have proposed that the thorn was a physical infirmity, the opposition of his fellow Jews,[46] or a harassing demon.[47]

We propose that he perceived an apparition or voice that he understood to be a harassing, demonic messenger from Satan. This perception might have afflicted him with some amount of negative commentary of the type characteristic for psychotic conditions, resulting in psychological distress.

The complexity of Paul's interactions in his perceptual experiences weighs against a seizure ictus as a cause, as does the lack of evidence for more common epileptic accompaniments, such as repetitive stereotyped behavioral changes and cognitive symptoms, as previously discussed. Paul does, however, manifest a number of personality characteristics similar to the interictal personality traits described by Geshwind,[48–50] such as deepened emotions; possibly circumstantial thought; increased concern with philosophical, moral and religious issues; increased writing, often on religious or philosophical themes; and, possibly, hyposexuality (1 Corinthians 7:8–9). These characteristics are controversial as to their specificity for epilepsy,[51,52] with a preponderance of larger studies not confirming a specific personality type associated with seizure disorders.[51–57] Similar features

may also be present in bipolar disorder[5,35,36] and schizophrenia.[35,36] As previously mentioned, productive writing tends to be more strongly associated with mood disorders than psychosis or epilepsy. This is persuasive toward Paul having a mood disorder, rather than schizophrenia or epilepsy.

Paul's religious conversion on the road to Damascus (Acts 9:1–19, 22:6–13, 26:9–16) is an event understood as marked by the acute onset of blindness. This blindness has been hypothesized to have been postictal in nature[43] or psychogenic.[58] There appears to be a lack of clarity as to whether this was literal visual blindness or metaphorical, since Paul refers to persons outside his immediate belief system as spiritually blind or having their eyes closed to spiritual truth (Acts 28:26; Romans 11:8, 11:10; 2 Corinthians 4: 3–5; Ephesians 1:18). Differences in the three most detailed conversion-experience accounts contribute to this ambiguity. Acts 26:12–18 relates his conversion, during which a vision of Jesus tasks him to spiritually open the eyes of the people to whom he will be sent (see Figure 4). In this account, there is no mention of acute-onset visual loss followed by its restoration. The application of the blindness metaphor in Acts 26:12–18 may suggest that Paul's own loss of vision was equally metaphorical and served as a descriptor of his profound realization of feeling suddenly bereft of spiritual understanding; that is, realizing his eyes to be spiritually closed, before the completion of his conversion to the new religious sect. In such an emotional state, it is speculated that he might have required encouragement and emotional assistance to reach Damascus. Another possibility would be that of blindness due to conversion disorder. The absence of other episodes of visual loss (i.e., lack of event stereotypy), the absence of features often seen with postictal blindness (a generalized seizure, anosognosia for deficit, or a gradual return of vision),[59] the presence of complex, mood-congruent auditory–visual experiences resembling hallucinations, and the possible sudden return of his eyesight with a compassionate touch does not fit well into a readily discernable neurological pattern of vision loss. His perceptual experiences, mood variability, grandiose-like symptoms, increased concerns about religious purity, and paranoia-like symptoms could be viewed as resembling psychotic spectrum illness (see Table 1). Psychiatric diagnoses that might encompass his constellation of experiences and manifestations could include paranoid schizophrenia, psychosis NOS, mood disorder-associated psychosis, or schizoaffective disorder. Paul's preserved ability to write and organize his thoughts would favor a mood disorder-associated explanation for his religious experiences.

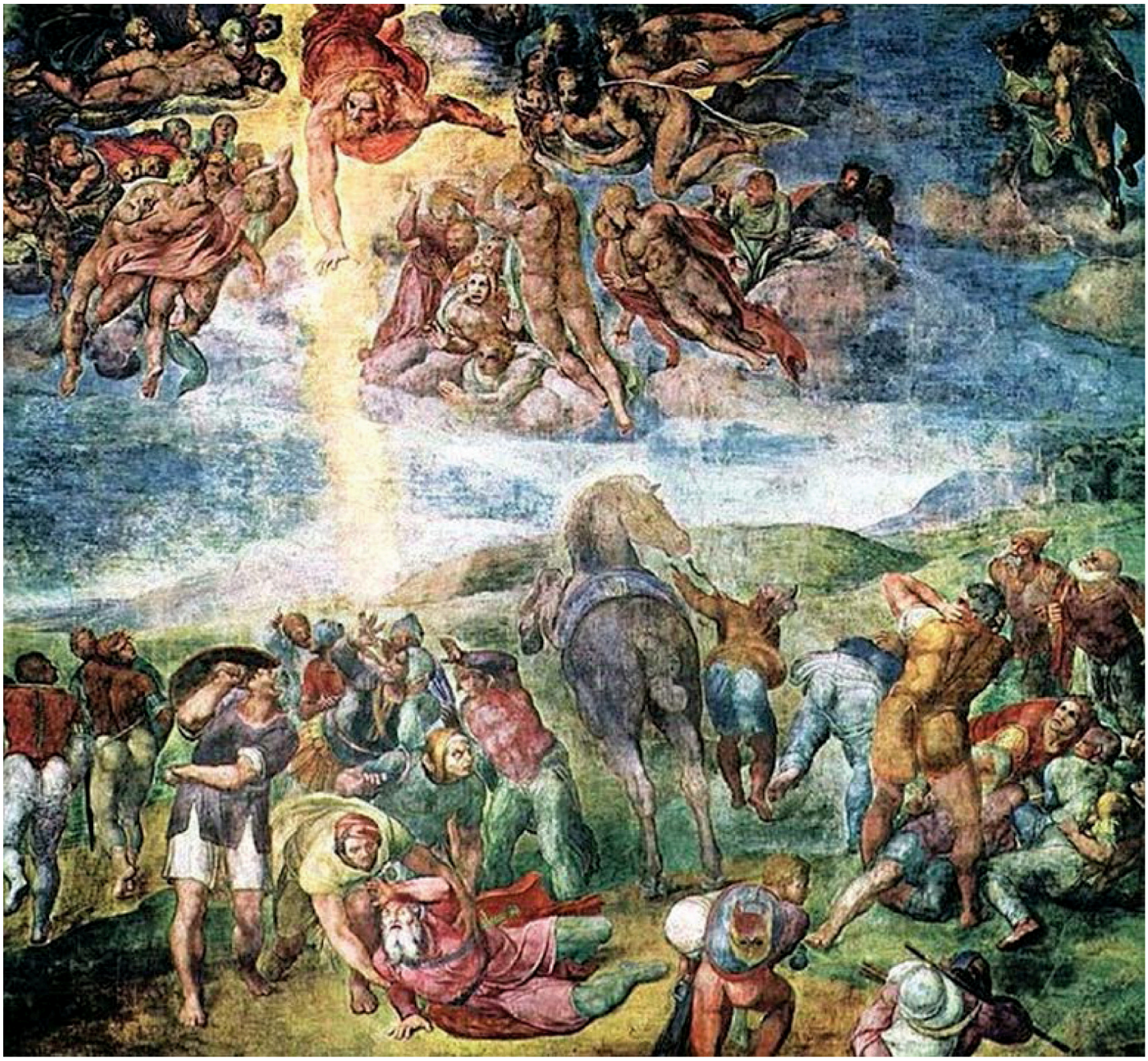

FIGURE 4. Saul of Tarsus Experiencing a Vision of Jesus While on the Road to Damascus (Acts 9:1–19, 22:6–13, 26:9–16)

The Conversion of Saul by Michelangelo Buonarroti (c.e. 1542–1545), Cappella Paolina, Vatican Palace, Vatican City

Commentary About Differential Diagnosis

Although Abraham had a revelatory experience during sleep (i.e., the prophecy foretelling his descendants' being enslaved in Egypt [Genesis 15:12–16]), and Paul had visions during the night (Acts 16:9, 18:9); most of the revelations experienced by these figures are not well explained by sleep phenomena such as dreams. A host of other conditions might precipitate revelation-like perceptual experiences (Table 4). Perhaps the foremost of these possibilities would be postictal and interictal psychotic states, which cannot be entirely excluded, since convulsions can be absent in some cases, and an absence of description in the sources does not exclude the possibility of seizures. Fear did occur with a number of Abraham and Moses' experiences, raising the prospect of a seizure aura of fear. Not all of their mystical experiences are recounted as associated with fear, indicating a lack of seizure-like stereotypy. In the event that seizure-related psychotic states were etiologic, the pathway to psychosis would be different, but the premise of psychosis having a formative role in their revelatory experiences would still be viable.

TABLE 4. Causes of Psychosis Secondary to Medical or Neurological Conditions

Brain neoplasms
Complex migraine
Delirium
Dementing illness

EXPAND TABLE

Nevertheless, based on the available descriptions that mention features bearing a striking resemblance to psychotic symptoms and the absence of mention of events resembling overt seizures, it is more parsimonious to explain these experiences as potentially due to a primary psychiatric condition. The remaining conditions in Table 4 are not particularly suggested by a medical review of the source material.

A shared psychotic disorder (folie à deux) is a possibility for each of the subjects discussed. The essential feature of this condition is that of a delusion that develops in an individual who is involved in a close relationship with another person, sometimes termed the "inducer" or "primary case," who already has a psychotic disorder with prominent delusions. The individual completely or partly comes to share the delusional beliefs of the primary case.[5,60] In our subjects, there are no known close associates having an equivalent spectrum and magnitude of symptoms who might serve the role of a primary case. Conversely, each of our subjects might also have theoretically served as a primary case in a shared psychotic-disorder relationship. Among other psychiatric explanations, which should be mentioned for completeness, are those of mystical experiences occurring as a result of unconscious forces.[61] These may manifest by way of conversion disorder or a dissociative condition such as a trance-like state or dissociative identity disorder (DID). Another possibility would be that of a deliberate misrepresentation of supernatural revelation. This hypothesis would require significant interpolation to support. An argument against this would be that the sources used appear entirely sincere about their belief in the divine origin of these experiences. A very complex state of affairs would be that of a psychotic disorder comorbid with deliberate misrepresentations, conversion symptoms, dissociative trance-like states, and DID. These hypotheses are mentioned to ensure an adequate appraisal of the possibilities despite an acknowledged inability to substantiate any of these processes being at work.

Limitations of the Analysis

The sources relied upon to derive information about our subjects are not medical records. The modern reader faces challenges interpreting events far removed from our own time and culture and which are recounted in a different language by authors who had their own biases. It might be supposed that our subjects can only be understood in the context of these factors and according to the norms of religious experience of their day. Others might advise that these religious writings should only be interpreted nonliterally, that is, metaphorically and abstractly, thereby eliminating the possibility of medical scrutiny.

Still others might propose that medical knowledge is always in a state of flux, which renders impermanent this type of analysis because of its dependence on the prevailing medical vogue of the day.[62] Retrospective diagnosis may also be asserted to be a transgression of medical principles, since a medical opinion is rendered on a patient who was never seen or examined.[62]

Starting with the last point, since it would offer an obstacle to any prerequisite ability to derive information about persons not present for examination, it is our view that it is an oversimplification to state that all diagnosis must ethically and methodologically rest upon having the patient present in person. The behavioral and neurological fields of medicine frequently rely upon the observations of family, friends, and associates of our patients because of patients' sometime reticence to talk about their symptoms, insufficiency of information, or inaccuracies of self-reporting. Samples of a patient's writing are frequently used to assess movement,[63] thought content, language function, organization, and ability to abstract. Moreover, advances in understanding human physiology have afforded us some confidence for interpreting certain types of findings, such as those attributed to the 6th century BCE Indian physician Shushruta, who described sweet urine.[64] We need not have been present to recognize a probable case of diabetes mellitus. Similarly, other conditions may bear sufficient signs through their descriptions in literature to allow discussion about their causes. The figures we have discussed have information to draw upon, some of which is held by religious tradition to be authored by the individuals (Moses and Paul), and some authored by close associates (of Jesus and Paul), who have potentially provided more information about them than available for most persons born before the present age. We recognize an important limitation inasmuch as we approach these source documents as most likely being composites of the perspectives and beliefs of authors, most of whom would not have personally known our subjects.[65,66] This would be similar to other ancient writers who related stories about people and events that they were not present to witness. This analysis depends upon our sources' reflecting, in some measure, actual people and events as they were.

The reader is then reminded that the medical interview and examination are not fixed in any general way. It is understood that a physician must adjust both interview and examination according to purpose and circumstance.[67,68] A psychiatrist may restrict examination to discussion about relevant feelings and perceptions, never physically touching the patient, but still reliably deducing level of alertness, orientation, attention, ability to self-regulate and perceive social cues, thought organization, language abilities, memory, insight, judgment, and general intelligence, among other things. A surgeon may emphasize the need to palpate a mass to determine its characteristics. These approaches are very different and are adjusted according to specific goals. The paradigm for understanding behavior in terms of a brain–behavior relationship is largely a product of the last century of brain research, and it was not available to our predecessors.[69] It is a useful exercise to apply our modern models of how behavior correlates to neural anatomy to test limits for localization and diagnosis while recognizing and offering scrutiny to their limitations.

We can briefly outline an example of how an understanding of modern functional neuroanatomy can allow a previously unattainable degree of discernment about an individual not present for examination. Setting aside questions about authenticity of authorship and actuality of events, we will look at what might be determined about St. Paul, ostensibly from his own hand. His writings indicate that he traveled extensively, even surviving many physical hardships (2 Corinthians 11:23–27). These activities would minimally necessitate generally intact motor function, sensation, and coordination. These abilities are now known to be accomplished through the

action of specific brain cortical–subcortical circuits (in frontal and parietal lobes) that are linked in a type of parallel processing and modulated by the cerebellum. The cortical–subcortical circuits are composed of their cortical target regions, and have as their constituents the striatum (caudate, putamen, ventral striatum), globus pallidus, and substantial nigra, and thalamus, which then projects back to the cortex.[70] These systems would appear to be grossly intact, to endure such extended travel and hardship. Paul's detailed recollections of events and his references to the contents of previous epistles advocate for intact memory systems, both semantic and episodic, at the time of his writing. These memory systems are now understood to be reliant on a deep-brain circuitry consisting of the hippocampus, fornix, mamillary body, mamillothalamic tract, anterior nucleus of the thalamus and cingulated gyrus (circuit of Papez). Paul spoke to many people on his journeys, indicating adequate function of language, which is dependent on perisylvian cerebral structures. His ability to form social relationships and speak persuasively using some metaphorical language suggests relatively preserved basic functions of frontal lobe and limbic systems, which oversee self-regulation, emotions, abstraction, ability to organize thoughts, and focus attention. His ability to maintain wakefulness, speak, eat, and breathe supports an adequately functioning brainstem. For circumscribed purposes, this examination can be more enlightening than that of a 1st-century-trained physician sitting in the room with St Paul or that of a 21st-century physician without the appropriate training. More nuanced assessment of cognition and behavior might be achieved via application of neuropsychiatric and behavioral neurological approaches that utilize modern understanding about patterns of neurological and psychiatric illnesses. The preceding inventory of St. Paul's generally intact neural systems can be largely extended to each of our subjects. This would be the first such inventory supporting a general preservation of such neural systems for Abraham, Moses, Jesus, and St Paul. It is acknowledged that medical analyses are, in the end, susceptible to being incorrect or incomplete and should always be open to revision when new information becomes available. Without academic scrutiny of methods and conclusions, improvements in understanding cannot be achieved.

We now turn to several lines of reasoning that favor the credibility of our proposals.

First, schizophrenia research has yielded compelling evidence to support the model for genetic vulnerability, coupled with environmental and psychosocial stressors, the so-called diathesis–stress model, as a mechanism by which schizophrenia occurs.[71–73]

Cross-cultural clinical characteristics,[74] an increased risk of having the disorder according to degree of kinship to those affected, a host of identified genes affecting risk for developing schizophrenia, and an increased prevalence of subtle brain developmental abnormalities in persons with schizophrenia[70,75] suggest interactions between genetic and environmental influences[75,76] that, so far as is known, would not be expected to have been different in persons living in the ancient world.

A second point hinges upon recognizing psychosis in the pages of ancient writings. Psychosis has been known by many names throughout history. Only recently has more precise nomenclature been developed. It should be no surprise that we would have difficulties recognizing cases in ancient writings when gazing through the eyes of ancient authors. Modern understanding about psychosis holds that a central feature is thought processes reflecting a highly distorted view of reality or a complete loss of contact with reality. DSM-IV-TR indicates that the term "psychotic" refers to a constellation of symptoms that may vary to some extent across diagnostic categories, but it generally refers to delusions, any prominent hallucinations, disorganized speech, or disorganized or catatonic behavior.[5] A delusion is a false belief based on incorrect inference about external

reality that is firmly sustained despite what almost everyone else believes and despite what constitutes incontrovertible and obvious proof or evidence to the contrary.

The belief is not one ordinarily accepted by other members of the person's culture or subculture.[5] Delusional conviction occurs on a continuum.[5] The depictions of our subjects indicate that they may have either found their own experiences not entirely believable to themselves, understood that their experiences would be hard for others to believe, or that they were perceived by their contemporaries as being mad. Genesis: 12–20 recounts that God made promises of blessings, progeny, and land to Abraham. Despite these assurances, Abraham's fear of death prompted him to surrender his wife to the affection of kings on two occasions in order to forestall his own execution. Moses, for his part, points out to God in Exodus 4:1 that the message he was given to bring to the Israelites stood a good chance of not being believed by a people whom we would now characterize as polytheistic,[77] superstitious, and therefore more likely to have accepted such happenings. Their rapid reversion to previous religious practices despite a series of miracles (Exodus 32) appears to support Moses' concern. Mark 3:21 confirms an occasion where Jesus' friends and family viewed him as mad or "beside himself." It is intrinsic to his narrative that the people of his hometown (Mark 6:1–6) and the religious authorities of the day also did not accept his message. St Paul's contemporary Festus, the local Roman governor of Judea, in Acts 26:24 exclaimed that Paul appeared "mad" or not sane. These events are closest in time to our subjects and might suggest psychotic type thought processes.

A third point speaks to the concern that religious and cultural factors of the day need to be taken into account. DSM-IV-TR recognizes that visual and auditory hallucinations with a religious content may be a part of normal religious experience in some cultures.[5] Rediger observes that there is a tendency of the Western mind-set to pathologize spiritual experiences and that there may be an overdependence of psychological interpretation on material existence.[78] He suggests that there is an anosognosia for experiential phenomena that exist outside the narrow band of consciousness that psychology apprehends and that there is a great deal to learn from Eastern traditions in this regard.[78] He recommends an approach that correlates phenomena falling outside the psychological paradigm with medical science rather than pathology. In harmony with this perspective is the recognition that some spiritual experiences can have very beneficial effects for transforming the lives of some individuals, allowing them to surmount obstacles and change destructive behaviors. In response to these thoughts, we emphasize that our intent is not to prove that the experiences of our subjects could not have resulted from normal religious experiences in the context of cultural factors; it is to apply a modern neurobehavioral paradigm to the experiences of our subjects and thereby advance a dialogue about the rational limits of perceptual experience. Toward this, we point out that their experiences, if they occurred as narrated, might also be conceptualized as psychotic spectrum because of their resemblances, by way of their recurrent nature, intensity, subject matter, grandiose-like qualities, and similarity to psychotic auditory-visual phenomena.

It is recognized that the content of schizophrenic delusions and hallucinations is significantly influenced by sociocultural background. Different cultural experiences can result in different delusional form and content.[79,80] The DSM-IV-TR criteria presume our ability to distinguish psychotic phenomena from other normal experiences in the context of a given culture. Unfortunately, evidence-based algorithms for accomplishing this are not available. Further complicating our task is the gulf of time over which we must work. Overcoming these

obstacles in some measure might again be accomplished through drawing on the perspectives of persons closer in time and culture to our subjects.

The earliest believers found the experiences of the subjects sufficiently removed from the sphere of normal life so as to be understood as a product of a highly unusual relationship with a divine force.[66] Those who did not believe may have had various reasons, some of which would have been that the message was too far from their reality to be accepted.

From today's vantage-point, if our subjects' experiences had resulted only from a convergence of normal individual and community religious experiences, we should have expected numerous such stories and therefore no reason to take notice of these now because of their mundane nature. Surviving literature, whether of Classical Greek, Roman period, or biblical origin, does not provide support that it was commonplace in the ancient world for the general population to have recurrent auditory-visual experiences as grand in scope as those of our subjects. The populations of the earliest followers of such new belief-systems, as those of our subjects, would constitute small groups able to accept the beliefs before the emergence of social pressures related to larger group dynamics. How do we explain the existence of the earliest followers? Their presence would not be expected from an association with individuals having a highly distorted view of reality.

Social models of psychopathology may be useful for understanding how this might have happened. Social-distance theory and communications-disorder theory suggest that differentiating sanity from psychosis can be achieved, based on the degree to which beliefs hamper or facilitate communication and acceptance by society. Those who deviate excessively from the societal norms do not relate to the populace, are not understood, become socially isolated and stigmatized, and may be identified as not sane.[81] This point of view might define as sane any person who is able to maintain acceptance and communication with a social group. Not accounted for by this theory are individuals who appear to demonstrate sustained paranoid, grandiose, messianic-type delusions, who, in more modern times, have drawn numbers of adherents. Two such individuals are David Koresh, of the Branch Dravidians,[82] and Marshall Applewhite, of the Heaven's Gate cult.[83] There are others in recent times who have claimed to be prophet, messiah,[84] Jesus,[85] Buddha,[86] avatar,[87] or madhi,[88] who have acquired followings. If David Koresh and Marshall Applewhite are appreciated as having psychotic-spectrum beliefs, then the premise becomes untenable that the diagnosis of psychosis must rigidly rely upon an inability to maintain a social group. A subset of individuals with psychotic symptoms appears able to form intense social bonds and communities despite having an extremely distorted view of reality. The existence of a better socially functioning subset of individuals with psychotic-type symptoms is corroborated by research indicating that psychotic-like experiences, including both bizarre and non-bizarre delusion-like beliefs, are frequently found in the general population. This supports the idea that psychotic symptoms likely lie on a continuum.[89–92]

Political-psychology models of leader–follower relationships may provide useful insights as to how early followers could have coalesced around our subjects. Wilner[93] surveyed the literature on the topic of charismatic leadership and defined it as a relationship between a leader and a group of followers, having the following properties:

1. The leader is perceived by the followers as somehow superhuman.
2. The followers blindly believe the leader's statements.
3. The followers unconditionally comply with the leader's directives for action.
4. The followers give the leader unqualified emotional support.

Also, Wilner identifies four “catalytic factors” that are shared by charismatic leaders. The first factor is the assimilation of a leader to one or more of the dominant myths of his society or culture. The second is the performance of what appears to be an extraordinary or heroic feat. The third is the projection of the possession of qualities with an uncanny or a powerful aura. Finally, there is outstanding rhetorical ability”[93].

It is reasonable to speculate that a charismatic leadership–follower group dynamic was present between our subjects and their followers. Little further comment can be made about Abraham in this regard since so little information is available about him. Moses felt himself not to be a good speaker, and his brother Aaron was appointed to speak on his behalf to the community (Exodus 4:10–16). This raises interesting questions about what roles community members might contribute to the functioning of a leadership–follower dynamic in order to supplement the leader’s deficiencies. The narratives of Jesus and Paul have details which could fit into a charismatic leader–follower paradigm of group behavior.

Creating and sustaining groups would be dependent on additional mechanisms:

Wilfred Bion[94] observed three patterns of group behavior that occur in healthy, mature adults, wherein group members act as if they are dominated: the dependency group, the pairing group, and the fight–flight group. The dependency group turns to an omnipotent leader for security, behaving as if they do not have independent minds of their own. Members blindly seek directions and follow orders unquestioningly. They tend to idealize and place the leader on a pedestal. When the leader fails to meet the standards of omnipotence and omniscience, a period of denial, then anger, and disappointment result. In the pairing group, the members act as if the goal of the group is to bring forth a messiah, someone who will save them. There is an air of optimism and hope that a new world is around the corner. The fight–flight group organizes itself in relationship to a perceived outside threat. The group itself is idealized as part of a polarizing mechanism, while the outside population is regularly seen as malevolent in motivation. The threatening outside world is at once a threat to the existence of the group and the justification for its existence. Each of these group types regularly characterizes the followers in charismatic leader–follower relationships.[95] It is reasonable to propose that one or more of these types of group dynamics were present to varying degrees, whether simultaneously or in various sequences, in our subjects’ groups as they developed their beliefs over time.

How do individuals with mental illness rise to positions of leadership? Ghaemi[96] sets forth a hypothesis that there are key elements associated with mental illness that may be beneficial for leadership abilities: realism, resilience, empathy, and creativity.[96] His analysis of several notable political, military and business leaders and review of psychological research leads to his proposal that depression can be associated with an increase in each of these qualities, and mania can be associated with an enhancement of creativity and resilience. Depression promotes leaders’ being more realistic and empathic, whereas mania promotes their being more creative and resilient.[96] He adds that when depression and mania occur together in bipolar disorder, it may result in a further increase in leadership skills. Such individuals, he proposes, benefit indirectly from entering and leaving these mood states in addition to being in their well state between episodes.[96] If this were to hold true, then our subjects might be more likely to have affective disorder-associated psychotic conditions and thereby could have benefitted from spending periods in various mood states, including their well states. The quality of realism would be expected to be most adversely affected in a psychotic state, especially when judged from the standpoint of modern sensibilities. With respect to religious beliefs arising during historical periods

preceding the advent of increased understanding about the natural world, there might have been less by which to judge this quality and, therefore, more cultural tolerance or acceptance of a wider range of ideas.

A shared psychotic disorder[5,60] is another means by which the earliest followers may have received their beliefs, with each of our subjects being a primary case. Although occurring primarily in the form of a dyadic relationship, paranoid delusions have been reported to occasionally occur in larger sect-like groups whose members become infused with the paranoid ideation of a dominant member. Norman Cameron termed this a "paranoid pseudocommunity."[97–99] This term is used to denote an imagined persecutorial conspiracy directed at the group member. Once separated from the group's social fabric, many members have been observed to regain the ability to view others without undue levels of suspicion.[100] This pattern of group behavior may lie along a continuum with that of the fight–flight group described by Wilfred Bion. Much more speculatively, each of our subjects and their followers could have been either an initiator or recipient in a chain of persons who transmit delusional-like beliefs. Each recipient would then act as the primary case to another individual. No reported cases of such a chain of transmission of delusion-like beliefs are known to the authors, and, therefore, this possibility is highly speculative. Generally speaking, it is an individual's insight and amenability to reason that are important means by which sane and psychotic thought processes are distinguished. A significant limitation of this analysis is that we cannot now know to what degree the beliefs of our subjects were fostered and maintained within a cultural "microbubble," and to what degree their beliefs were amenable to being changed through reasonable processes.

Last, in response to the proposal that a non-literal interpretation of religious writings is most advisable, it is observed that, since the earliest of times, believers have understood our subjects' experiences as having occurred literally as described. As such, a great many of these experiences bear a striking resemblance to well-characterized psychiatric phenomena. This raises the prospect of an unusual degree of accuracy in the sources with regard to these details.

Discussion about a potential role for the supernatural is outside the scope of our article and is reserved for the communities of faithful, religious scholars, and theologians, with one exception. It is our opinion that a neuropsychiatric accounting of behavior need not be viewed as excluding a role for the supernatural. Herein, neuropsychiatric mechanisms have been proposed through which behaviors and actions might be understood. For those who believe in omnipotent and omniscient supernatural forces, this should pose no obstacle, but might rather serve as a mechanistic explanation of how events may have happened. No disrespect is intended toward anyone's beliefs or these venerable figures.

If such is perceived after reading this analysis it might be asked whether there is a stigma in the reader's mind about mental illness. Any stigma toward persons with mental illness is rejected by the authors.

Future Directions

Research into this postulated form of psychiatric presentation might be facilitated by development of a new DSM diagnostic subcategory of schizophrenia or psychosis and an improved recognition that a continuum of psychotic symptomatology likely exists.

This subcategory might be referred to as a grandiose or supraphrenic (supra [above or beyond] phrenic [mind]) variant. It would encompass those who are symptomatic for 6 months or more, with an organized and relatively

nonbizarre delusional system, grandiosity, often delusional narcissism, possible hallucinations, and an extremely intense feeling of being supernaturally selected for a mission. It would recognize that when this occurs in individuals with generally average-or-higher intelligence, strong communication skills, a high degree of magnetic charisma, and the ability to effectively engender empathy, these individuals may be capable of convincing or psychologically enthralling groups or populations of individuals to follow their directives for undefined periods of time. Their goals are partly or wholly based on or inspired by psychotic thought processes. These thought processes may yield beliefs that are closely related to other common societal beliefs, but they are not very amenable to reason. Affected individuals may demonstrate a preserved ability to maintain a social group, be very persuasive, and become socially elevated in a group and exercise inordinate influence over others in the group. Their beliefs may result in the sponsorship of activities that are lethal to self and others and are outside the norms for their society. Disorganization, negative psychiatric symptoms, and cognitive dysfunction are not significantly present. Affective features may be present, but are not usually debilitating. Hyperreligiosity would be a frequent accompaniment, but is not necessarily required, since extreme devotion to other socio-political belief systems or perceived extraterrestrial or supernatural forces might serve as surrogates. These individuals are capable of having extraordinary influence on individuals and society.

Conclusion

We suggest that some of civilization's most significant religious figures may have had psychotic symptoms that contributed inspiration for their revelations. It is hoped that this analysis will engender scholarly dialogue about the rational limits of human experience and serve to educate the general public, persons living with mental illness, and healthcare providers about the possibility that persons with primary and mood disorder-associated psychotic-spectrum disorders have had a monumental influence on civilization.

Acknowledgments

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