

Over and above

Bad Moon Rising: the persistent belief in lunar connections to madness

I see the bad moon arising.
I see trouble on the way.
I see earthquakes and lightnin'.
I see bad times today.
— Creedence Clearwater Revival

Six patients walk into the emergency department asking for opiates while 3 code blues are announced on the PA. Someone mutters, “Damn! It must be a full moon!”

The belief that the moon exerts an influence on human affairs has survived rather obstinately through history. Hippocrates wrote that “no physician should be entrusted with the treatment of disease who was ignorant of the science of astronomy.”¹ Even when, in the 17th century, Johannes Kepler caused the disciplines of astrology and astronomy to diverge with his discovery that the motions of the planets followed mathematical laws, the belief in the moon’s influence lingered. And lingered it has to this day. A study by Rotton and Kelly in 1985 showed that 50% of university students believed that people act strangely during a full moon.² In 1995, Vance reported that as many as 81% of mental health professionals believed that the full moon alters individual behaviour.³

In the popular imagination, lunar influences on the human mind are often ascribed to the moon’s gravitational effects. Not everyone realizes that, although the moon is able to move oceans, this is achieved only because the moon’s gravity acts over the 12 800-km diameter of the earth, which pulls back with a comparable force. But the moon exerts no influence on smaller bodies of water such as lakes and even some seas, and the difference between a person’s weight in the presence of the moon’s gravity and his or her weight if there were no moon is “less than the effect of a mosquito on one’s shoulder.”⁴ It is also important to realize that these gravitational forces are dependent on the distance between the earth and the moon, and on the alignment of the sun, earth and moon, and not on the *phases* of the moon.

The observations made by Galileo Galilei of the phases of the moon remain correct in today’s astronomical understanding. There are 8 phases of the moon, which succeed each other with a periodicity of 3.69 days: new, waxing crescent, first quarter, waxing gibbous, full, waning gibbous, last quarter, waning crescent. Astronomy also defines 5 different lunar cycles based on different parameters of time and distance from the earth: tropical, draconic, sidereal, anomalistic and synodic



Fred Sebastian

— the synodic cycle being the interval between 2 successive new moons. This is the time it takes the moon to complete an orbit around the earth (29.53 days), corrected for the earth’s orbit around the sun.² Most superstition and many studies associated with the influence of the moon on human behaviour take into consideration only the full moon in the synodic cycle.⁵

All this being said, the association between lunar phases and human behaviour preoccupies us less today than in the past. One obvious explanation is that, before the advent of gas lighting at the beginning of the 19th century, the light of the moon permitted outdoor activities that were otherwise impossible. Full-moon nights are 12 times brighter (under a clear sky) than at first or last quarter, and therefore it is likely that people stayed up later and slept less than the rest of the time.⁶ Even partial sleep deprivation over the course of a single night can induce mania,⁶ and it is plausible that sleep disturbance during a full moon may function as a positive feedback once a manic episode has begun in a predisposed individual. Perhaps this lies at the origin of the association between madness and the full moon.

In the 16th century, Paracelsus wrote that “mania has the following symptoms: frantic behaviour, unreasonableness, constant restlessness and mischievousness. Some patients suffer from it depending on the phases of the moon.”⁶ Lord Blackstone, an 18th-century English jurist, was the first to define a condition of madness exacerbated by the lunar cycle: “A lunatic, or *non compos mentis*, is properly one who hath lucid intervals, sometimes enjoying his senses and sometimes not and that frequently depending upon the changes of the

moon.”⁶ During the 19th century, the German psychologist Ewald Hering observed in his textbook of psychiatry that “with full moon, increasing mania.”⁶ At the Bethlehem (or Bedlam) Hospital in London, inmates were chained and flogged at certain phases of the moon “to prevent violence.” This barbarous practice was abolished only in 1808 through the efforts of John Haslam, the hospital’s apothecary.⁷ Benjamin Rush, the father of American psychiatry, kept accurate records of patients’ conditions during the phases of the moon but observed a behavioural association in only “few cases.”¹¹

Modern thought on the correlation between the lunar cycle and human behaviour is divided between those who give credence to a “lunar effect” (i.e., that more “lunacy” occurs during certain phases of the moon) and those who debunk this idea as a “Transylvania effect” (i.e., fanciful thinking).⁸ In a way, the debate has not changed much in the last 2000 years. In the first century AD, Pliny the Elder thought the full moon gave birth to especially heavy nocturnal dew and caused the brain to become “unnaturally moist,” leading to both madness and epileptic attacks.⁶ This was echoed in the 20th century by Arnold Lieber’s notion of “biological tides” by which “the moon, via the effects of gravitational forces on the human organism, causes cyclic changes in water flow among the fluid compartments of the body (extracellular, intravascular, and intraluminal).”⁹ This theory took shape in the 1970s with Lieber’s finding of a statistically significant lunar periodicity for homicides over 15 years, with a peak at full moon and just after the new moon.⁹ The results for aggression were similar, and the size of the gravitational force was found to be directly proportional to qualitative differences in individual acts of violence: the stronger the force, the more heinous the crimes. Lieber’s book *How the Moon Affects You* became a best-seller and is still in print, although his results have not been replicated.¹⁰

Continuing enthusiasm for the field gave rise to further attempts to explain how the moon might influence behaviour. Although moonlight has little influence on our activities in the age of electricity, other connections have been made with the ozone layer, geomagnetism, electromagnetism, weather, ions and extremely-low-frequency waves.⁸

The moon moves oceans but exerts no influence on smaller bodies of water.

A large body of evidence has accumulated over the last 30 years debunking the correlation between the moon and madness as a “Transylvania effect.” In 1978 Campbell and Beets reviewed 16 studies on the moon’s effects on mental disturbance,¹¹ including studies on psychiatric admissions, suicides and homicides. They found no relation between the full moon and human behaviour and concluded that the few positive findings were examples of type I errors.

In 1985 Rotton and Kelly conducted a meta-analysis of 37 studies⁸ and found that the phases of the moon accounted for no more than 1% of the variance in activities usually termed lunacy and that evidence for the lunar hypothesis failed 3 crucial tests: replicability, statistical significance and predictability. Rotton and Kelly subsequently developed a scale for assessing belief in the lunar effects, using 9 items to assess personal beliefs and the perception of others’ beliefs with respect to lunar effects on human behaviour.² They found that participants’ scores correlated with other measures of belief in paranormal phenomena, were negatively correlated with logical ability and were not correlated with measures of personality such as social desirability, locus of control and authoritarianism.

Other studies have looked at specific behaviours associated with the full moon. In 1992 Byrnes and Kelly reviewed 12 studies conducted over 20 years that looked at the number of crisis calls and their correlation to the phases of the moon.¹² They found no evidence of a trend associated with moon phase and concluded that the full moon was not associated with a higher frequency of calls reporting disturbing behaviour.

Also in 1992, a critical review of 20 studies done over 28 years linking suicide and the lunar phase concluded that most studies showed no relation between the lunar phase and measures of suicide.¹³ Positive findings could not be replicated and were confounded by variables such as season, day of the week, weather and holidays.

Looking at 100 psychiatric admissions of developmentally disabled adults over a 4-year period, Gorvin and Roberts found that the relation with the full moon was an example of an “illusory correlation.”¹⁴ The full moon accounted for only 0.007% of variance, and thus the results were contrary to the lunar hypothesis.

In 1997 Amaddeo and colleagues studied the number of all psychiatric contacts in the province of Verona over a 10-year period and their correlation to the synodic cycle.¹⁵ They tested the null hypothesis versus a sinusoidal distribution of contacts according to lunar phases and found no relation between the 4 intervals of the synodic month and frequency of contact. Similarly, no significant results were found by setting the expected surge in consultation at 1–3 days after the full moon.

The relation between the full moon and aggression was studied at 5 inpatient settings in Sydney, Australia.¹⁶ The “Morrison’s hierarchy of violence and aggression” was used as a behavioural scale, and the lunar phases were defined with Poisson regression over 105 weeks. No relation was found, as the trend of increasing violence across the 4 phases did not reach significance. There was also no modification of patterns when weekends and public holidays were taken into account. The investigators concluded that the severity of violent behaviour did not vary with phases of the moon.

Why, then, is the belief in a “lunar effect” still so strong? Explanations include: a lack of understanding of physics, psychological biases (e.g., selective recall or selective perception), sensationalism, and the entertainment value of a belief in lunar influence. The philosopher and poet George Santayana once observed, “Men become superstitious, not because they have too much imagination, but because they are not aware that they

have any.” Health professionals should carefully consider whether a belief in “lunar mental effects” influences their own professional behaviours. Something to keep in mind when you end up on call under the light of the full moon.

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An unsuitable old age: the paradoxes of elder care

There is a spectre haunting Canadians. Will we be able to get the health care we need when we need it? Many Canadian baby-boomers first encounter a system gone wrong when a parent becomes ill: they become caught in the emergency department crisis, the waits on hallway stretchers, the palpable frustration of all. The problem is often portrayed as government inefficiency, but this incomplete diagnosis leads to wrong prescriptions. To sharpen the diagnosis, consider the following paradoxes about ageing and health care.

1. Unless they double up and triple up on their illnesses, there won't be enough old people to go around. This may seem ludicrous, but let's do the math. The heart society advocates for more heart doctors and heart nurses, and for the latest heart diagnostic devices to allow for the latest heart treatments. It's a neat syllogism: heart disease is highly age-related; the population is ageing; therefore, there will be more heart disease, and we must act now. The lung society tells us the same about lung disease, the kidney society about kidney disease ... But when many of these old people show up in facilities ostensibly built in their name, they are sent away as “unsuitable.” Why? Because they arrive for their procedure not just with one problem but with a host of other ailments, too. In a word, their multiple, interacting medical and social problems make them frail. Geared to the sophisticated treatment of single problems, our system doesn't accommodate the complexity of caring for frail elderly patients, even though that is where much of our demand comes from.

2. The ideal patient is otherwise healthy. The unsuitability of frail older people for the patient role is well known: many cannot give a proper history; their temperatures go down in the face of infection; they are hyponatremic for no good reason; and their medication list is endless. Not to mention the “unsuitable” demands made by their families, who naturally focus on outcomes: “I need Dad to walk again if I am to take him home,” versus “We have treated his pneumonia and now it's time for him to go.” In such a case, families can be forgiven for thinking that it is the care that is unsuitable, not the patient. Not recognizing the cognitive impairment that makes for the “poor historian,” or sending home a patient who newly cannot walk are common examples of how “the system” fails because we don't know better. The reasons that we don't are complex, but they are an educational, not a moral, failing: simply blaming doctors won't do. Not admitting our ignorance won't, either.

3. It's more rewarding to do things to people than for them. When people have just a few things wrong with them, it's perfectly reasonable to focus on those few things, especially when “to do to” (say, replace a painful hip) equates with “to do for” (relieve suffering, increase mobility). In such cases, we can ignore a few days of discomfort and focus on (and pay for) the skilled procedure. But this might not take into account the vulnerability of the patient who is frail. To replace a hip in someone who never recovers from an unrecognized and untreated postoperative delirium means that the link between the procedure and the preferred patient outcome has been lost. Yet our present accounting of what goes on and