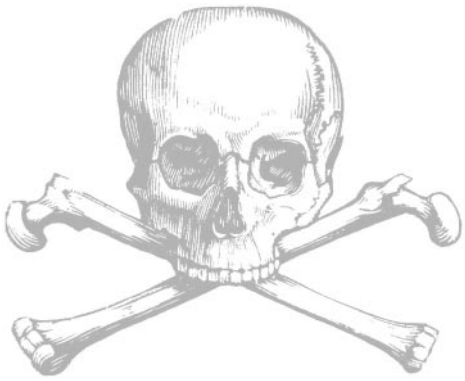
"VOODOO" Death



Walter Bradford Cannon, MA, MD. From: "Voodoo" death. *American Anthropologist*. 1942;44(new series):169–181.

In records of anthropologists and others who have lived with primitive people in widely scattered parts of the world is the testimony that when subjected to spells or sorcery or the use of "black magic" men may be brought to death. Among the natives of South America and Africa, Australia, New Zealand, and the islands of the Pacific, as well as among the negroes of nearby Haiti, "voodoo" death has been reported by apparently competent observers. The phenomenon is so extraordinary and so foreign to the experience of civilized people that it seems incredible; certainly if it is authentic it deserves careful consideration. I propose to recite instances of this mode of death, to inquire whether reports of the phenomenon are trustworthy, and to examine a possible explanation of it if it should prove to be real.

First, with regard to South America. Apparently Soares de Sousa was first to observe instances of death among the Tupinambás Indians, death induced by fright when men were condemned and sentenced by a so-called "medicine man." . . . Thus the chief or medicine man gains the reputation of exercising supernatural power. And by intimidation or by terrifying augury or prediction he may cause death from fear. . . .

Also in New Zealand there are tales of death induced by ghostly power.

In Brown's *New Zealand and Its Aborigines* there is an account of a Maori woman who, having eaten some fruit, was told that it had been taken from a tabooed place; she exclaimed that the sanctity of the chief had been profaned and that his spirit would kill her. This incident occurred in the afternoon; the next day about 12 o'clock she was dead. According to Tregear the *tapu* (taboo) among the Maoris of New Zealand is an awful weapon. "I have seen a strong young man die," he declares, "the same day he was tapued; the victims die under it as though their strength ran out as water. . . ."

Dr. S. M. Lambert of the Western Pacific Health Service of the Rockefeller Foundation wrote to me that on several occasions he had seen evidence of death from fear. In one case there was a startling recovery. At a Mission at Mona Mona in North Queensland were many native converts, but on the outskirts of the Mission was a group of non-converts including one Nebo, a famous witch doctor. The chief helper of the missionary was Rob, a native who had been converted. When Dr. Lambert arrived at the Mission he learned that Rob was in distress and that the missionary wanted him examined. Dr. Lambert made the examination, and found no fever, no complaint of pain, no symptoms or signs of disease. He was impressed, however, by the obvious indications that Rob was seriously ill and extremely weak. From the missionary he learned that Rob had had a bone pointed at him by Nebo and was convinced that in consequence he must die. Thereupon Dr. Lambert and the missionary went for Nebo, threatened him sharply that his supply of food would be shut off if anything happened to Rob and that he and his people would be driven away from the Mission. At once Nebo agreed to go with them to see Rob. He leaned over Rob's bed and told the sick man that it was all a mistake, a mere joke—indeed, that he had not pointed a bone at him at all. The relief, Dr.

Lambert testifies, was almost instantaneous; that evening Rob was back at work, quite happy again, and in full possession of his physical strength. . . .

Obviously, the possible use of poisons must be excluded before "voodoo" death can be accepted as an actual consequence of sorcery or witchcraft.

Also it is essential to rule out instances of bold claims of supernatural power when in fact death resulted from natural causes; this precaution is particularly important because of the common belief among aborigines that illness is due to malevolence. I have endeavored to learn definitely whether poisoning and spurious claims can quite certainly be excluded from instances of death, attributed to magic power, by addressing enquiries to medically trained observers. . . .

Dr. J. B. Cleland, Professor of Pathology at the University of Adelaide, has written to me that he has no doubt that from time to time the natives of the Australian bush do die as a result of a bone being pointed at them, and that such death may not be associated with any of the ordinary lethal injuries. In an article which included a section on death from malignant psychic influences, Dr. Cleland mentions a fine, robust tribesman in central Australia who was injured in the fleshy part of the thigh by a spear that had been enchanted. The man slowly pined away and died, without any surgical complication which could be

Walter Bradford Cannon, MA, MD (1871– 1945), circa 1908. Photo by J. E. Purdue & Co, Boston, Mass. *Source*. Prints and Photographs Collection, History of Medicine Division, National Library of Medicine.

Walter Bradford Cannon

Pioneer Physiologist of Human Emotions

ONE OF AMERICA'S LEADING physiologists and most respected scientific statesmen of the 20th century, Walter Bradford Cannon was born on October 19, 1871, in Prairie du Chien, Wis, the son of Colbert Hanchett Cannon, a railroad official, and Sarah Wilma Denio, a high school teacher. He attended primary and secondary school in Wisconsin and Minnesota before entering Harvard College in 1892. At Harvard, Cannon was attracted to the biological sciences and to psychology and philosophy.[1] He graduated summa cum laude in 1896 and entered Harvard Medical School.

In medical school, Cannon sought out opportunities for research. The professor of physiology, Henry P. Bowditch, put him to work using x-rays, discovered less than a year before, to explore the mechanism of swallowing. Cannon and his coworker devised techniques for visualizing the movement of digestive organs, and thus he began his investigation of the physiology of digestion, a topic that occupied him for the next decade and a half and launched his career as a physiologist. When Cannon graduated from medical school in 1900, he was appointed instructor in physiology. In 1906, he succeeded Bowditch as George Higginson Professor of Physiology and chair of the Harvard Department of Physiology.

Cannon was early attracted to problems in the physiology of emotion. In 1897, he noticed that when his experimental animals were frightened or in some other way disturbed, peristaltic waves in the stomach sometimes ceased abruptly. After publishing his synthetic *The Mechanical Factors of Digestion* in 1911, Cannon turned his attention to a broadly conceived investigation of the physiology of the emotions, thus becoming the first major investigator to work systematically on this topic.[2]

Cannon collected evidence to show that when an animal is strongly aroused, the sympathetic division of its autonomic nervous system combines with the hormone adrenaline to mobilize the animal for an emergency response of "flight or fight." The "sympathico-adrenal system" orchestrates changes in blood supply, sugar availability, and the blood's clotting capacity in a marshaling of resources keyed to the "violent display of energy." He summarized his initial findings in his path-breaking 1915

detected. Dr. Cleland cites a number of physicians who have referred to the fatal effects of bone pointing and other terrifying acts. In his letter to me he wrote, "Poisoning is, I think, entirely ruled out in such cases among our Australian natives. There are very few poisonous plants available and I doubt whether it has ever entered the mind of the central Australian natives that such might be used on human beings." . . .

Before denying that "voodoo" death is within the realm of possibility, let us consider the general features of the specimen reports mentioned in foregoing paragraphs. First . . . is the fixed assurance that because of certain conditions, such as being subject to bone pointing or other magic, or failing to observe sacred tribal regulations, death is sure to supervene. This is a belief so firmly held by all members of the tribe that the individual not only has that conviction himself but is obsessed by the knowledge that all his fellows likewise hold it. Thereby he becomes a pariah, wholly deprived of the confidence and social support of the tribe. In his isolation the malicious spirits which he believes are all about him and capable of irresistibly and calamitously maltreating him, exert supremely their evil power. . . .

In his terror he refuses both food and drink, a fact which many observers have noted and which, as we shall see later, is highly significant for a possible understanding of the slow onset of weakness. The victim "pines away"; his strength runs out like water, to paraphrase words already quoted from one graphic account; and in the course of a day or two he succumbs.

The question which now arises is whether an ominous and persistent state of fear can end the life of a man. Fear, as is well known, is one of the most deeply rooted and dominant of the emotions. Often, only with difficulty can it be eradicated. Associated with it are profound physiological disturbances, widespread throughout the organism. There is evidence that some of these disturbances, if they are lasting, can work harmfully. In order to elucidate that evidence I must first indicate that great fear and great rage have similar effects in the body. Each of these powerful emotions is associated with ingrained instincts—the instinct to

book, *Bodily Changes in Pain, Hunger, Fear and Rage*.[3]

In 1917 and 1918, Cannon turned his physiological expertise to wartime service. At various laboratories and field hospitals in England and France, he worked as "laboratory hermit" and "field investigator" on the problems of wound shock, studying its complex chain of phenomena.[4] He and his colleagues first focused on blood acidosis but soon realized that this was a secondary consequence of a primary impairment: "an inadequate supply of oxygen to tissues because of deficient circulation of the blood. . . . due to a reduced volume of blood in the circulatory system."[4] Emergency treatment then focused on the prompt replacement of fluid lost from the blood stream.

After the war, Cannon returned to his earlier studies, pursuing several fruitful lines of investigation over the next 2 decades. His most important work concentrated on the complexities of chemical neurotransmission (for which Otto Loewi received a Nobel Prize in 1936) and on "homeostasis" (a term coined by Cannon in 1926), the maintenance of steady states in the body and the physiological processes through which they are regulated. Beginning in 1928, Cannon turned increasing attention to the clinical implications of his physiological discoveries, thus becoming a major authority in the emerging research field of psychosomatic medicine.[5]

At this point in his career, Cannon also became a major public and political figure. He had earlier been involved in defending animal experimentation in medical research against the attacks of antivivisectionists, and he now emerged as a strong defender of the scientific community against the assault of fascist governments.[6] He became a national leader of such organizations as the Medical Bureau to Aid Spanish Democracy and, a few years later, the American–Soviet Medical Society. Cannon was neither naive nor an apologist for the Communist Party, but an extraordinarily open-minded man who spoke out on the causes of his day with the courage of his convictions.

Cannon died in Franklin, NH, in 1945 as a beloved and much-honored investigator, teacher, mentor, and public role model. He was several times considered "prize-worthy" by the Nobel committee but never received that honor. Yet one of his admirers, Ralph W. Gerard, said in 1972 that despite being, in his view, unfairly overlooked, Cannon was nonetheless "the greatest American physiologist."[7] He was, indeed, "a rather immortal hero." ■

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attack, if rage is present, the instinct to run away or escape, if fear is present. Throughout the long history of human beings and lower animals these two emotions and their related instincts have served effectively in the struggle for existence. When they are roused they bring into action an elemental division of the nervous system, the so-called sympathetic or sympathico-adrenal division, which exercises a control over internal organs, and also over the blood vessels. As a rule the sympathetic division acts to maintain a relatively constant state in the flowing blood and lymph, i.e., the "internal environment" of our living parts. It acts thus in strenuous muscular effort; for example, liberating sugar from the liver, accelerating the heart, contracting certain blood vessels, discharging adrenaline and dilating the bronchioles. All these changes render the animal more efficient in physical struggle, for they supply essential conditions for continuous action of laboring muscles. Since they occur in association with the strong emotions, rage and fear, they can reasonably be interpreted as preparatory for the intense struggle which the instincts to attack or to escape may involve. If these powerful emotions prevail, and the bodily forces are fully mobilized for action, and if this state of extreme perturbation continues in uncontrolled possession of the organism for a considerable period, without the occurrence of action, dire results may ensue. . . .

What effect on the organism is produced by a lasting and intense action of the sympathico-adrenal system? In observations by Bard, he found that a prominent and significant change . . . was a gradual fall of blood pressure . . . from the high levels of the early stages to the low level seen in fatal wound shock. In Freeman's research he produced evidence that this fall of pressure was due to a reduction of the volume of circulating blood.

This is the condition which during World War I was found to be the reason for the low blood pressure observed in badly wounded men—the blood volume is reduced until it becomes insufficient for the maintenance of an adequate circulation. Thereupon deterioration occurs in the heart, and also in the nerve centers which hold the blood vessels in moderate contraction. A vicious circle is then established; the low blood pressure damages the very organs which are necessary for the maintenance of an adequate circulation, and as they are damaged they are less and less able to keep the blood circulating to an effective degree. In . . . wound shock, death can be explained as due to a failure of essential organs to receive a sufficient supply of blood or, specifically, a sufficient supply of oxygen, to maintain their functions.

The gradual reduction of blood volume . . . can be explained by the action of the sympathico-adrenal system in causing a persistent constriction of the small arterioles in certain parts of the body. If adrenaline, which constricts the blood vessels precisely as nerve impulses constrict them, is continuously injected at a rate which produces the vasoconstriction of strong emotional states, the blood volume is reduced. . . .

The foregoing paragraphs have revealed how a persistent and profound emotional state may induce a disastrous fall of blood pressure, ending in death. Lack of food and drink would collaborate with the damaging emotional effects, to induce the fatal outcome. These are the conditions which, as we have seen, are prevalent in persons who have been reported as dying as a consequence of sorcery. They go without food or water as they, in their isolation, wait in fear for their impending death. In these circumstances they might well die from a true state of shock, in the surgical sense—a shock induced by prolonged and tense emotion. . . .

[E]vidence of the possibility of a fatal outcome from profound emotional strain was reported by Mira in recounting his experiences as a psychiatrist in the Spanish War of 1936–39. In patients who suffered from what he called "malignant anxiety," he observed signs of anguish and perplexity, accompanied by a permanently rapid pulse (more than 120 beats per minute) and a very rapid respiration (about three times the normal resting rate). These conditions indicated a perturbed state deeply involving the sympathico-adrenal complex. As predisposing conditions Mira mentioned "a previous lability of the sympathetic system" and "a severe mental shock experienced in conditions of physical exhaustion due to lack of food, fatigue, sleeplessness, etc." The lack of food appears to have attended lack of water, for the urine was concentrated and extremely acid. Towards the end the anguish still remained, but inactivity changed to restlessness. No focal symptoms were observed. In fatal cases death occurred in three or four days. Postmortem examination revealed brain hemorrhages in some cases, but, excepting an increased pressure, the cerebrospinal fluid showed a normal state. The combination of lack of food and water, anxiety, very rapid pulse and respiration, associated with a shocking experience having persistent effects, would fit well with fatal conditions reported from primitive tribes.

The suggestion which I offer, therefore, is that "voodoo death" may be real, and that it may be explained as due to shocking emotional stress—to obvious or repressed terror. A satisfactory hypothesis is one which allows observations to be made which may determine whether or not it is correct.

Fortunately, tests of a relatively simple type can be used to learn whether the suggestion as to the nature of "voodoo death" is justifiable. The pulse towards the end would be rapid and "thready." The skin would be cool and moist. A count of the red blood corpuscles, or even simpler, a determination by means of a hematocrit of the ratio of corpuscles to plasma in a small sample of blood from skin vessels would help to tell whether shock is present; for the "red count" would be high and the hematocrit also would reveal "hemoconcentration." The blood pressure would be low. The blood sugar would be increased, but the measure of it might be too difficult in the field. If in the future, however, any observer has opportunity to see an instance of "voodoo death," it is to be hoped that he will conduct the simpler tests before the victim's last gasp. ■