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Journal of the History of Ideas, Vol. 31, No. 1. (Jan. - Mar., 1970), pp. 133-142.

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Fri May 11 15:27:02 2007

WILLIAM JAMES ON THE EMOTIONS

HOWARD M. FEINSTEIN*

Promptly after its publication in 1890, William James's *Principles of Psychology* stirred critical comment about the influence of his personality on the text. The book was saturated with personal illustrations which contributed to its lively style and its value as a biographical document. One reviewer, G. Stanley Hall, shrewdly predicted that "A book so individual in its style and method will inevitably invite attention more and more to the personality of the author, it is just these elements and idiosyncrasies that will be valuable material for the inductive methods of the future psychology."[1] In this paper, I focus on one chapter of the *Principles*, "The Emotions," to study the interplay between the author's life history and the formulation of his theory of the emotions.[2] The study is pursued from two complementary vantage points. Analysis of the chapter increases the biographer's understanding of James at an important point in his career. The intellectual historian can examine it as a provocative specimen of the process by which a creative individual formulates an idea which is both a precipitate of elements in his intellectual climate and one of the factors which creates that climate.

In the introduction to the *Principles*, James explicitly sets himself the task of moving beyond the limitations of both empiricist and scholastic psychology. His was to be a psychology which took full cognizance of the brain as the organ of the mind; a psychology rooted in neurophysiology and the discoveries of the experimental laboratory. In contrast to this, the scholastic psychology of the period postulated a soul with "faculties" such as memory or reasoning in order to explain mental phenomena. Instead of invoking a soul for a theoretical base, the associationist schools explained mental phenomena as diverse combinations of sensory impressions

*I am indebted to Professors R. MacLeod, Cushing Strout, and David Davis for their encouragement and advice in the preparation of this study.

[1]G. Stanley Hall, "The Principles of Psychology," *American Journal of Psychology*, III (1891), 585–91.

[2]I refer to this as James's theory of the emotions throughout the paper instead of calling it the James-Lange theory. This is justified because the two men arrived at the theory independently. The critic might charge that since Lange also developed the same idea the value of this study is questionable. The formulation of the theory must be independent of a specific individual's psychology. Brief consideration will show that this is not a serious difficulty. It is quite possible to reach the same conclusion from many different routes. That William James reached this conclusion is the starting point for this study. That there was a personal context for the development of Lange's ideas, I would assume to be true though its delineation is not the subject of this study. It should also be noted that one is not justified in mechanically transposing James's personal context to Lange though they arrived at a similar theoretical conclusion.

which formed the rudimentary building blocks of the edifice of mind. As a spokesman for "the new psychology," James insisted that both schools must take into account the structure and function of the nervous system. "*The spiritualist and the associationist must both be 'cerebralists,'* to the extent at least of admitting that certain peculiarities in the way of working of their own favorite principles are explicable only by the fact that the brain laws are a codeterminant of the result."[3] Though he trumpeted a call to explain mental life on the basis of physical structure and function, James was not wholehearted in his materialism.

His colleague, Charles S. Peirce, noted the disparity between James's materialistic method and his religious inclinations. "Of course, he is materialistic to the core—that is to say, in a methodical sense, but not religiously, since he does not deny a separable soul nor a future life." This was to be explained, he speculated, by the influence of James's father and his medical training. "Brought up under the guidance of an eloquent apostle of a form of Swedenborgianism, which is materialism driven deep and clinched on the inside, and educated to the materialistic profession, it can only be by great natural breadth of mind that he can know what materialism is, by having experienced some thoughts that are not materialistic."[4] James Ward, a British psychologist and friend, was also struck by the seeming contradiction between the positions defended by James in his psychology. "I should apply to you the words of Goethe: 'Es sind zwei Menschen in dieser Brust,' *u.s.w.* I shall some day perhaps play off James the psychologist against James the metaphysician, moralist and human."[5] George Santayana was also struck by the conflict between James's method and his "metaphysical instincts" and called particular attention to the chapter on the emotions which is the focus of this study. "The most striking characteristic of his book is, perhaps the tendency everywhere to substitute a physiological for a mental explanation of the phenomena of mind. . . . But Professor James, to whose religious and metaphysical instincts materialism is otherwise so repulsive, has here outdone the materialists themselves . . . this may be found in his striking theory of the emotions."[6]

In their letters and reviews, James's friends and colleagues enumerated what can justifiably be considered criteria for raising psychological questions about a man's work. They pointed to the unique personal style enriched with his own experiences to illustrate the argument of the text. Furthermore they found troublesome inconsistencies which were not to be explained on the basis of poor logic. To these two, I would add a third which would have been known to his friends but certainly not part of their published comments; that is James's long struggle with depression and what the neurologists of the time called neurasthenia. Through psychoanalysis, we have learned to understand such symptoms. Symptoms may provide an opportunity for dis-

[3]James, *The Principles of Psychology* (New York, 1950), I, 4-5.

[4]C. S. Peirce, "James's Psychology," *The Nation*, LIII (1891), 15.

[5]R. B. Perry, *The Thought and Character of William James* (Boston, 1935), II, 99.

[6]Santayana, "James's Psychology," *Atlantic Monthly*, LXVII (1891), 552f.

covering the price a man pays for maintaining coherence in the course of his life. The point is not that a great man like James who has symptoms should automatically be thought of as a psychological "case" but rather that the language of symptoms is best interpreted by someone who is familiar with this form of communication. It is an assumption of a psychoanalytic study, that the emotional conflicts of a man's past will be reflected in his creative work, though ultimately this has to be demonstrated. That past conflicts help shape the present is an assumption that James would have understood. In writing of the effect of creative individuals on their societies he pointed to "the zone of formative processes" as "the dynamic belt of quivering uncertainty, the line where past and future meet."[7]

The fulcrum of James's theory is his statement that "bodily changes follow directly the perception of the exciting fact, and that our feeling of the same changes as they occur is the emotion."[8] The novelty of this theory was its challenge to the common sense view that an emotion is a feeling which is perceived first and then causes bodily changes. James insisted that it was more accurate to say that "we feel sorry because we cry, angry because we strike, afraid because we tremble, and not that we cry, strike, or tremble, because we are sorry, angry, or fearful, as the case may be."[9]

The earliest statement of James's thoughts on the emotions is to be found on the flyleaf of his copy of Lotze's *Medicinische Psychologie* which he read in 1867–1868. He wrote, "Emotions due to bodily reverberations."[10] While Lotze emphasized the influence of organic sensations on the emotions, he was not as radical as James. He retained feelings as distinct mental elements over and above the sensations of bodily reaction. It is significant that the note on the flyleaf dates from a time when James had personal reasons to be concerned with the nature of the emotions. He was, at that time, a young American invalid who had turned to the spas of the continent for a cure. He was twenty-six and by then had considered, tried, and discarded careers in painting, chemistry, and biology. He was making a half-hearted effort to complete medical studies which he interrupted frequently because of visual, back, and bowel symptoms. Intellectually, James was excited by the newly developing field of physiological psychology. One wonders whether he was at that time pursuing an explanation for his own emotional difficulties as well. The note on the flyleaf, which points in the direction of the theory he later developed, might have suggested an explanation to him; an explanation which fitted his materialistic medical training, and also was in the same line of thrust as Darwin's thinking.

James was frank in reporting the sequence of development of his ideas about the usefulness of his theory. The sequence is instructive because it reveals how it was repeatedly reshaped by movements in the field and enlargements in his own point of view. James was probably referring to the period of 1867–1868 when he noted in his paper of 1884 that the theory grew

[7]James, "The Importance of Individuals," *The Will to Believe and Other Essays in Popular Philosophy* (New York, 1897), 259.

[8]James, *Principles*, II, 449. [9]*Ibid.*, 450. [10]Perry, *op. cit.*, 89.

out of "fragmentary introspective observations."[11] It was only after these had combined into a theory that he thought of another use for his hypothesis. He suggested the theory was also valuable as a means of simplifying ideas about cerebral physiology. Instead of being forced to look for areas in the cortex which were specialized for the perception of emotion, his theory was based on the very same motor and sensory areas already discovered as necessary for other sensory and motor processes. When he prepared his chapter for the *Principles*, he incorporated yet another use for his theory. Up to that time psychologists had devoted themselves to describing the emotions. Recognizing that morphology is the most primitive level of scientific study, and in this area of psychology a most unproductive one, James suggested that the theory could be used as a basis for a study of causality: " . . . we now have the question as to how any given 'expression' of anger or fear may have come to exist; and that is a real question of physiological mechanics on the one hand, and of history on the other, which [like all real questions] is in essence answerable, although the answer may be hard to find."[12] If emotions could be grouped and studied on the basis of their underlying causes, the science of psychology could be advanced to a more abstract and productive level of theory.

In raising the question of causation, James reflected an important juncture in his own intellectual development and that of his field. He knew that literary artists were also concerned with the causes of emotions. "As emotions are described in novels, they interest us, for we are made to share them. We have grown acquainted with the concrete objects and emergencies which call them forth, and any knowing touch of introspection which may grace the page meets with a quick and feeling response."[13] This, of course, was the direction that his younger brother Henry took in his already well-established career as a novelist. His father was also concerned with a study of emotions but from the vantage point of the aphoristic philosopher. "Confessedly literary works of aphoristic philosophy also flash lights into our emotional life, and give us a fitful delight."[14] While the psychologists of his time tried to be scientific in the manner of the physical sciences, to James's mind they only succeeded in being boring. "But as far as 'scientific psychology' of the emotions goes, I may have been surfeited by too much reading of classic works on the subject, but I should as lief read verbal descriptions of the shapes of the rocks on a Newhampshire farm as toil through them again."[15]

Almost two decades before the *Principles*, Darwin had directed scientific thinking about the emotions in an organic-biological direction. "Most of our emotions are so closely connected with their expression, that they hardly exist if the body remains passive. . . . A man, for instance, may know that his life is in extreme peril, and may strongly desire to save it; yet as Louis XVI said, when surrounded by a fierce mob, 'Am I afraid? Feel my pulse.' So a man may intensely hate another, but until his bodily frame is affected, he cannot be said to be enraged."[16]

[11]James, "What is an Emotion," *Mind*, IX (1884), 188–205.

[12]James, *Principles*, II, 454. [13]*Ibid.*, 448. [14]*Ibid.* [15]*Ibid.*,

[16]Darwin, *The Expression of the Emotions in Man and Animals* (New York, 1873), 239f.

If one knows of this influence on his thinking, James's unequivocal statement that "the general causes of the emotions are indubitably physiological" can be understood in context.[17] Following Darwin, he assumes that "the nervous system of every living thing is but a bundle of predispositions to react in particular ways upon the contact of particular features of the environment. . . . The neural machinery is but a hyphen between determinate arrangements of matter outside the body and determinate impulses to inhibition or discharge within its organs."[18] In this trend in psychology, "cause" meant a necessary bodily condition.

While taking full cognizance of the intellectual influences on James and his stated intention to keep his psychology close to physiology, the turn of his thinking on the emotions still requires further explanation. He himself stated that the question of cause was both a question of physiology and a question of history. Why did he turn his back so fastidiously on the historical? As already noted, his colleagues were struck by the radical nature of his materialism in *this particular area*. Janet, a French neurologist, who also worked with a mechanical model for theory building, accused James of having left the "psychic" out of his theory.[19] James's extreme materialism is even more puzzling when we realize that the very same year his first paper on the emotions appeared, he also published a preliminary version of his famous chapter on "The Stream of Thought." (It had been written in the previous year.) Here he showed himself as the brilliant analyst of the phenomenology of consciousness. In the "Stream of Thought" chapter, James was critical of the atomism of traditional psychology: "What must be admitted is that the definitive images of traditional psychology form but the very smallest part of our minds as they actually live. The traditional psychology talks like one who should say a river consists of nothing but pailsful, spoonsful, quartpotsful, barrelsful, and other moulded forms of water. Even were the pails and the pots all actually standing in the stream, still between them the free water would continue to flow. It is just this free water of consciousness that psychologists resolutely overlook."[20] Yet in his essay on the emotions he treats the emotions as just such circumscribed atomistic categories and "resolutely" overlooks the personal context which is the way emotions "actually live."

James was to be criticized by many of his contemporaries for treating emotions in a way which seemed so remote from the way they are experienced. Wundt, Irons, Ladd, Worcester, and others charged that he ignored the fact that the same stimulus produced different emotions in the same individual. They argued that he talked as if emotions derive exclusively from the stimulus and this was obviously false. In his rebuttal of 1894, James admitted that his critics were correct but alleged that it was merely a matter of misunderstanding as he had explained himself poorly. He failed to make clear that he thought of the stimulus as including the entire situa-

[17]James, *Principles*, II, 449. James, in *Mind*, *loc. cit.*, 14–15.

[19]Quoted in Jean P. Sartre, *The Emotions, Outline of a Theory* (New York, 1948), 25.

[20]James, *Principles*, I, 255.

tion in which it occurred. "A reply to these objections is the easiest thing in the world to make if one only remembers the force of association in psychology. 'Objects' are certainly the primitive arousers of instinctive reflex movements. But they take their place, as experience goes on, as elements in total 'situations,' the other suggestions of which may prompt movements of an entirely different sort."[21] While James might have had the total situation in mind, his critics were quite right in finding no evidence of this in either paper that he published on the subject of the emotions. With his gifts for introspective observation, and the direction of thought which had emerged in his study of the stream of consciousness, James might just as easily have developed a theory of the emotions which focused on their history—the obscure connections of emotional experiences in individual lives (as Freud was to do). With the tools and the inclination to follow an intuitive artistic exploration of the depths, he moved willfully instead in an opposite direction.

Fortunately, James gives some clues as to the forces which were at work that may have prodded him in this direction. These clues are in the form of personal illustrations used to counter objections to his hypothesis. The first objection that he anticipated was skepticism that particular perceptions do produce wide-spread bodily effects by an immediate physical influence. To demonstrate that such events do take place he reported the following incident. "The writer well remembers his astonishment, when a boy of seven or eight, at fainting when he saw a horse bled. The blood was in a bucket, with a stick in it, and, if memory does not deceive him, he stirred it round and saw it drip from the stick with no feeling save that of childish curiosity. Suddenly the world grew black before his eyes, his ears began to buzz, and he knew no more. He had never heard of the sight of blood producing faintness or sickness, and he had so little repugnance to it, and so little apprehension of any sort of danger from it, that even at that tender age, as he well remembers, he could not help wondering how the mere physical presence of a pailful of crimson fluid could occasion in him such formidable bodily effects."[22]

The tale of the bled horse which purports to show that bodily changes do indeed take place without the prior arousal of an emotion is more interesting as an illustration of the constriction of consciousness, possibly for unconscious reasons. One can hardly believe that the bleeding which James referred to did not stir his emotions.[23] Children can't avoid getting

[21] James, "The Physical Basis of Emotion," *Psychological Review*, I (1894), 518.

[22] James, *Principles*, II, 457.

[23] I have taken a description of bleeding from a veterinary text of the period referred to by James in order to reproduce the context of the recollection for modern readers. W. C. Spooner, ed., *Youatt On The Structure and The Diseases of The Horse With Their Remedies* (Auburn, 1851), 166f: "This operation is performed with a fleam or a lancet. . . . A bloodstick—a piece of hard wood loaded at one end with lead—is used to strike the fleam into the vein. This is sometimes done with too great violence and the opposite side of the coat of the vein is wounded. . . . In affections of the hind extremity, blood is sometimes extracted from the saphaena

bruised and cut in their play, and in so doing become acquainted with blood. Perhaps more significantly, William's father was a cripple, who had suffered a double amputation on one leg without anaesthesia when he was thirteen. His father's deformity and the story which went with it were well known to that seven-year-old boy. Rather than having no apprehensions about a pail of blood, it seems more likely that he had a wealth of emotionally charged associations which could have been aroused by a bled horse. Perhaps, he liked to think of himself as a courageous little boy who was not at all squeamish at the sight of that vital "crimson fluid."

This emphasis on voluntary control of emotion is evident in the corollary to his theory which states that emotions can be aroused by voluntary mimicking of the bodily changes usually associated with the emotion. James recognized that many of the bodily changes were not under voluntary control. But within these limits he still claimed that experience proved the corollary to his thesis. "Refuse to express a passion, and it dies. . . . Whistling to keep up courage is no mere figure of speech. On the other hand, sit all day in a moping posture, sigh, and reply to everything with a dismal voice, and your melancholy lingers. There is no more valuable precept in moral education than this, as all who have experience know: if we wish to conquer undesirable emotional tendencies in ourselves, we must assiduously and in the first instance cold-bloodedly, go through the *outward motions* of those contrary dispositions we prefer to cultivate. The reward of persistency will infallibly come in the fading out of the sullenness or depression, and the advent of real cheerfulness and kindliness in their stead. Smooth the brow, brighten the eye, contract the dorsal rather than the ventral aspect of the frame, and speak in a major key, pass the genial compliment, and your heart must be frigid indeed if it does not gradually thaw!"[24] As this illustration shows, he was primarily concerned with substituting right feelings for morbid ones. Like the little boy who stood bravely by and watched the blood streaming from the horse's leg, the grown man wanted to believe that doing away with fear and depression was primarily a matter of will.

This insistence on the voluntary control of the emotions was still evident in James's thought in 1899, when "The Gospel of Relaxation" was published in *Scribner's Magazine*.[25] In spite of the reservations he made in the more technical discussion of the *Principles*, James now stated unequivocally that "by regulating the action which is under more direct control of the will, we can indirectly regulate the feeling which is not."[26] There can be no

or thigh vein. . . . The horse is blindfolded on the side on which he is to be bled, or his head turned well away. . . . A sharp rap with the bloodstick or the hand on that part of the back of the fleam immediately over the blade, will cut through the vein, and the blood will flow. . . . Care . . . should be taken that the blood flows in a regular stream into the centre of the vessel, for if it is suffered to trickle down the sides, it will not afterwards undergo those changes by which we partially judge of the extent of inflammation. . . . When sufficient blood had been taken, the edges of the wound should be brought closely and exactly together, and kept together by a small sharp pin being passed through them."

[24] James, in *Mind, loc. cit.*, 21-22.

[25] James, "The Gospel of Relaxation," *Scribner's Magazine*, XXV (1899), 499-507.

[26] *Ibid.*, 500.

doubt that he saw healthy mindedness as a logical outgrowth of his theory. Here, too, as in the *Principles,* he indicated his awareness of another possible direction for exploration of the emotions but turns away from it. In the *Principles,* he acknowledged the insight which literary art offers but did not pursue it. In the popular article for *Scribner's*, he mentioned the work of Freud—a "Viennese neurologist of considerable reputation" but chose to set Freud's insights aside as he described the virtues of willful relaxation. Ironically, James provided a remarkably skillful description of his own emotional symptoms in connection with Freud's ideas. But he overlooked the possible help a study of the depths offered him. "A Viennese neurologist of considerable reputation has recently written about the *Binnenleben,* as he terms it, or buried life of human beings. No doctor, this writer says, can get into really profitable relations with a nervous patient until he gets some sense of what the patient's *Binnenleben* is, of the sort of unuttered inner atmosphere in which his consciousness dwells alone with the secret of its prison house. The inner personal tone is what we can't communicate or describe articulately to others, but the wraith and ghost of it, so to speak, is often what our friends and intimates feel as our most characteristic quality. In the unhealthy minded, apart from all sorts of old regrets, ambitions checked by shames and aspirations obstructed by timidities, it consists mainly of bodily discomforts not distinctly localized by the sufferer, but breeding a general self-mistrust and sense that things are not as they should be with him. . . . In the healthy minded, on the contrary, there are no fears or shames to discover. . . ."[27]

A further clue to the forces which influenced James in the formulation of his radically materialistic theory can be seen in his contention that it explained pathological and normal cases under a common scheme. "In every asylum we find examples of absolutely *unmotived* fear, anger, melancholy, or conceit; and others of an equally *unmotived* apathy which persists in spite of the best of outward reasons why it should give way."[28] One must note that in calling attention to this "best proof" of his theory, James was again enlarging the scope of his theory (or disclosing the origin of his interest). As outlined at the beginning of the chapter in the *Principles,* the theory focused on two aspects of the emotions. It was primarily concerned with the sequence of events in the nervous system which it took to be stimulus-perception-bodily change-perception of bodily change. In addition to the neurological process, the theory also dealt with the psychological experience of the emotion which was claimed to be limited to the perception of the bodily changes provoked by the stimulus. Now James added a third dimension. In addition to the neurological process and the psychological phenomena, his theory also dealt with the causes of emotions as found in normal and pathological cases. The "unmotived" emotions, he postulated, are due to a peculiar liability of the "nervous machinery."

There can be little doubt that James had his own emotional symptoms

[27]James, "Gospel," 500.

[28]James, *Principles,* II, 459

in mind when he called on this support for his theory. To illustrate it, he cited the following case: "if inability to draw deep breath, fluttering of the heart, and that peculiar epigastric change felt as 'precordial anxiety' with an irresistible tendency to take a somewhat crouching attitude and to sit still, and, with perhaps other visceral processes not now known, all *spontaneously* occur together in a certain person; his feeling of their combination *is* the emotion of dread, and he is the victim of what is known as morbid fear."[29] In *The Varieties of Religious Experience* James described his own experience of morbid anxiety in similar terms. It centered on the image of a "squatting" (i.e., crouching) epileptic patient. "There was such a horror of him, and such a perception of my own merely momentary discrepancy from him, that it was as if something hitherto solid within my breast gave way entirely, and I became a mass of quivering fear. After this the universe was changed for me altogether. I awoke morning after morning with a horrible dread at the pit of my stomach, and with a sense of the insecurity of life that I never knew before, and I have never felt since. . . ."[30]

This passage is important because it places James's anxiety symptoms in a context which provides some lead as to one cause of his anxiety. If we treat the flow of ideas in this part of the chapter in the *Principles* as related unconsciously as well as consciously it may supply part of the "historical" answer which James insisted did not exist. First comes the event of the bleeding horse which we have already quoted extensively. This was offered as proof that there are perceptions which produce bodily changes prior to the arousal of an emotion. Next he mentions the drawing of knife blades across each other. This is part of a class of events in which the "ideal emotion seems to precede the bodily symptoms." But often it is nothing but an anticipation of the bodily changes which one has already experienced on another occasion. He then offers another illustration of this class. "One who has already fainted at the sight of blood may witness the preparations for a surgical operation with uncontrollable heart-sinking and anxiety."[31] Starting with the image of his having fainted at the sight of blood for no apparent reason he moves to an image of knives being drawn across each other and then to what might be considered an interpretation of his bled horse fainting episode—its unconscious connection with a feared surgical operation (for which the knives were being made ready). Then comes the description of morbid anxiety. It seems reasonable to conclude that his illustrations point to one unconscious cause of the morbid terror which plagued him—fear of bodily injury. Here again we can relate this to his father's amputation and the image which was central to his own anxiety experience reported in the *Varieties*—an epileptic—someone whose brain was irreparably damaged.

Here then, is the crux of the argument. If morbid anxiety is a spontaneous neural phenomenon and emotion is nothing but the perception of

[29] *Ibid.*, 450. (My italics.)

[30] James, *The Varieties of Religious Experience* (New York, 1964), 135f.

[31] James, *Principles*, II, 458.

these spontaneous bodily changes, then the cause of his suffering was explained and one need look no further. In retrospect, we can see how James's theory was colored by the style he had developed to deal with his own prolonged emotional turmoil—suppression and moral exhortation on the conscious level and repression and denial on the level of unconscious mental functioning. This mechanistic explanation made it seem unnecessary to challenge the claim (or the wish) that the emotions seen in the insane asylum or experienced by James when he verged on insanity were in fact "unmotived." One must admire James's creative capacity to synthesize the diverse elements of his intellectual and emotional world into a theory which built on his picture of himself as a sufferer from a bodily affliction who had recovered through an act of will while at the same time drawing on the discoveries of Darwin, Lotze, Bain, Montegazza, and others to provide the laboratories of the "new psychology" with a testable theory of the emotions.

Living and laboratory investigation have failed to provide supporting evidence for William James's theory of the emotions.[32] I have traced the development of his thinking on this subject over a period of thirty years with close attention to his texts in an attempt to delineate the complex interaction between personal biographical experiences and intellectual currents of influence. Raised in the atmosphere of religious preoccupation of his father's home but schooled in the science of physiology, James knew intimately the struggle between science and religion which dominated the intellectual scene of post Civil War America. Though materialistically trained, he inclined temperamentally toward a unique, passionate view of the world. For many reasons, some of which have to do with the influence of Darwin and the spirit of the "new psychology" and some which have to do with his own emotional history, he moved willfully against his own temperament. His theory of the emotions emerged from this fecund soil.

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[32]Sherrington reported that a dog in whom spinal and vagal transsection completely removed the sensation of all the skin and muscles behind the shoulder "showed no obvious diminution of her emotional character." He concluded that vascular and organic sensations act in "reenforcing rather than initiating the psychosis." C. S. Sherrington, *The Integrative Action of the Nervous System.* (New Haven, 1906), 261, 268. Cannon found that sympathectomy which removed the responsiveness of the vascular system had no effect on the expression of the emotions in cats. He also noted that 1, the same visceral changes occur in very different emotional states and in non-emotional states; 2, the viscera are relatively insensitive structures; 3, visceral changes are too slow to be a source of emotional feeling; 4, artificial induction of the visceral changes typical of strong emotions does not produce them. He concluded that the experimental data do not support the James-Lange theory. W. B. Cannon, *Bodily Changes In Pain, Hunger, Fear and Rage* (New York, 1929), Chap. XVIII.