# Chapter 4 The Fight-or-Flight Response

# A Cornerstone of Stress Research

R. McCarty

Vanderbilt University, Nashville, TN, USA

# References

1.[Benison S, Barger AC.](file:///D%3A%5C%5Cwomat-filecopy%5C%5CEd-Reference%5C%5C0002570113.html%22%20%5Cl%20%22rfLink1rf0010) *[Walter B. Cannon: The Life and Times of a Young Scientist.](file:///D%3A%5C%5Cwomat-filecopy%5C%5CEd-Reference%5C%5C0002570113.html%22%20%5Cl%20%22rfLink1rf0010)* [Cambridge, MA: Belknap Press; 1987.](file:///D%3A%5C%5Cwomat-filecopy%5C%5CEd-Reference%5C%5C0002570113.html%22%20%5Cl%20%22rfLink1rf0010)

2.[Cannon WB. Movements of the intestines studied by means of the Roentgen rays.](file:///D%3A%5C%5Cwomat-filecopy%5C%5CEd-Reference%5C%5C0002570113.html%22%20%5Cl%20%22rfLink2rf0015) *[J Med Res](file:///D%3A%5C%5Cwomat-filecopy%5C%5CEd-Reference%5C%5C0002570113.html%22%20%5Cl%20%22rfLink2rf0015)*[. 1902;7:72–75.](file:///D%3A%5C%5Cwomat-filecopy%5C%5CEd-Reference%5C%5C0002570113.html%22%20%5Cl%20%22rfLink2rf0015)

3.[Cannon WB. Studies on the conditions of activity of adrenal glands. V. The isolated heart as an indicator of adrenal secretion induced by pain, asphyxia and excitement.](file:///D%3A%5C%5Cwomat-filecopy%5C%5CEd-Reference%5C%5C0002570113.html%22%20%5Cl%20%22rfLink3rf0020) *[Am J Physiol](file:///D%3A%5C%5Cwomat-filecopy%5C%5CEd-Reference%5C%5C0002570113.html%22%20%5Cl%20%22rfLink3rf0020)*[. 1919;50: 399–432.](file:///D%3A%5C%5Cwomat-filecopy%5C%5CEd-Reference%5C%5C0002570113.html%22%20%5Cl%20%22rfLink3rf0020)

4.[Cannon WB, de la Paz D. Emotional stimulation of adrenal secretion.](file:///D%3A%5C%5Cwomat-filecopy%5C%5CEd-Reference%5C%5C0002570113.html%22%20%5Cl%20%22rfLink4rf0025) *[Am J Physiol](file:///D%3A%5C%5Cwomat-filecopy%5C%5CEd-Reference%5C%5C0002570113.html%22%20%5Cl%20%22rfLink4rf0025)*[. 1911;28:64–70.](file:///D%3A%5C%5Cwomat-filecopy%5C%5CEd-Reference%5C%5C0002570113.html%22%20%5Cl%20%22rfLink4rf0025)

5.Bernard C; Hoff HE, Guillemin R, Guillemin L (Translators). Lectures on the Phenomena of Life Common to Animals and Plants. Springfield, IL: Charles C. Thomas; 1974.

6.[Holmes FL. Claude Bernard, the](file:///D%3A%5C%5Cwomat-filecopy%5C%5CEd-Reference%5C%5C0002570113.html%22%20%5Cl%20%22rfLink5rf0030) *[milieu intØrieur](file:///D%3A%5C%5Cwomat-filecopy%5C%5CEd-Reference%5C%5C0002570113.html%22%20%5Cl%20%22rfLink5rf0030)* [and regulatory physiology.](file:///D%3A%5C%5Cwomat-filecopy%5C%5CEd-Reference%5C%5C0002570113.html%22%20%5Cl%20%22rfLink5rf0030) *[Hist Philos Life Sci](file:///D%3A%5C%5Cwomat-filecopy%5C%5CEd-Reference%5C%5C0002570113.html%22%20%5Cl%20%22rfLink5rf0030)*[. 1986;8:3–25.](file:///D%3A%5C%5Cwomat-filecopy%5C%5CEd-Reference%5C%5C0002570113.html%22%20%5Cl%20%22rfLink5rf0030)

7.[Goldstein DS.](file:///D%3A%5C%5Cwomat-filecopy%5C%5CEd-Reference%5C%5C0002570113.html%22%20%5Cl%20%22rfLink6rf0035) *[Adrenaline and the Inner World.](file:///D%3A%5C%5Cwomat-filecopy%5C%5CEd-Reference%5C%5C0002570113.html%22%20%5Cl%20%22rfLink6rf0035)* [Baltimore, MD: The Johns Hopkins University Press; 2006.](file:///D%3A%5C%5Cwomat-filecopy%5C%5CEd-Reference%5C%5C0002570113.html%22%20%5Cl%20%22rfLink6rf0035)

8.[Cannon WB. The adrenal medulla.](file:///D%3A%5C%5Cwomat-filecopy%5C%5CEd-Reference%5C%5C0002570113.html%22%20%5Cl%20%22rfLink7rf0040) *[Bull N Y Acad Med](file:///D%3A%5C%5Cwomat-filecopy%5C%5CEd-Reference%5C%5C0002570113.html%22%20%5Cl%20%22rfLink7rf0040)*[. 1940;16: 3–13.](file:///D%3A%5C%5Cwomat-filecopy%5C%5CEd-Reference%5C%5C0002570113.html%22%20%5Cl%20%22rfLink7rf0040)

9.[Cannon WB, Rosenblueth A. Studies on conditions of activity in endocrine organs. XXIX. Sympathin E and sympathin I.](file:///D%3A%5C%5Cwomat-filecopy%5C%5CEd-Reference%5C%5C0002570113.html%22%20%5Cl%20%22rfLink8rf0045) *[Am J Physiol](file:///D%3A%5C%5Cwomat-filecopy%5C%5CEd-Reference%5C%5C0002570113.html%22%20%5Cl%20%22rfLink8rf0045)*[. 1933;104:557–574.](file:///D%3A%5C%5Cwomat-filecopy%5C%5CEd-Reference%5C%5C0002570113.html%22%20%5Cl%20%22rfLink8rf0045)

10.[Rosenblueth A, Cannon WB. Studies on conditions of activity in endocrine organs. XXVIII. Some effects of sympathin on the nictitating membrane.](file:///D%3A%5C%5Cwomat-filecopy%5C%5CEd-Reference%5C%5C0002570113.html%22%20%5Cl%20%22rfLink9rf0050) *[Am J Physiol](file:///D%3A%5C%5Cwomat-filecopy%5C%5CEd-Reference%5C%5C0002570113.html%22%20%5Cl%20%22rfLink9rf0050)*[. 1932;99:398–407.](file:///D%3A%5C%5Cwomat-filecopy%5C%5CEd-Reference%5C%5C0002570113.html%22%20%5Cl%20%22rfLink9rf0050)

11.[von Euler US. Identification of the sympathomimetic ergone in adrenergic nerves of cattle (Sympathin N) with laevo-noradrenaline.](file:///D%3A%5C%5Cwomat-filecopy%5C%5CEd-Reference%5C%5C0002570113.html%22%20%5Cl%20%22rfLink10rf0055) *[Acta Physiol Scand](file:///D%3A%5C%5Cwomat-filecopy%5C%5CEd-Reference%5C%5C0002570113.html%22%20%5Cl%20%22rfLink10rf0055)*[. 1948;16:63–74.](file:///D%3A%5C%5Cwomat-filecopy%5C%5CEd-Reference%5C%5C0002570113.html%22%20%5Cl%20%22rfLink10rf0055)

12.[Ahles A, Engelhardt S. Polymorphic variants of adrenoceptors: pharmacology, physiology and role in disease.](file:///D%3A%5C%5Cwomat-filecopy%5C%5CEd-Reference%5C%5C0002570113.html%22%20%5Cl%20%22rfLink11rf0060) *[Pharmacol Rev](file:///D%3A%5C%5Cwomat-filecopy%5C%5CEd-Reference%5C%5C0002570113.html%22%20%5Cl%20%22rfLink11rf0060)*[. 2014;66:598–637.](file:///D%3A%5C%5Cwomat-filecopy%5C%5CEd-Reference%5C%5C0002570113.html%22%20%5Cl%20%22rfLink11rf0060)

13.[Cannon WB. The emergency function of the adrenal medulla in pain and the major emotions.](file:///D%3A%5C%5Cwomat-filecopy%5C%5CEd-Reference%5C%5C0002570113.html%22%20%5Cl%20%22rfLink12rf0065) *[Am J Physiol](file:///D%3A%5C%5Cwomat-filecopy%5C%5CEd-Reference%5C%5C0002570113.html%22%20%5Cl%20%22rfLink12rf0065)*[. 1914;33:356–372.](file:///D%3A%5C%5Cwomat-filecopy%5C%5CEd-Reference%5C%5C0002570113.html%22%20%5Cl%20%22rfLink12rf0065)

14.[Cannon WB.](file:///D%3A%5C%5Cwomat-filecopy%5C%5CEd-Reference%5C%5C0002570113.html%22%20%5Cl%20%22rfLink13rf0070) *[Bodily Changes in Pain, Hunger, Fear and Rage.](file:///D%3A%5C%5Cwomat-filecopy%5C%5CEd-Reference%5C%5C0002570113.html%22%20%5Cl%20%22rfLink13rf0070)* [New York: Appleton-Century; 1915.](file:///D%3A%5C%5Cwomat-filecopy%5C%5CEd-Reference%5C%5C0002570113.html%22%20%5Cl%20%22rfLink13rf0070)

15.[Cannon WB.](file:///D%3A%5C%5Cwomat-filecopy%5C%5CEd-Reference%5C%5C0002570113.html%22%20%5Cl%20%22rfLink14rf0075) *[The Wisdom of the Body.](file:///D%3A%5C%5Cwomat-filecopy%5C%5CEd-Reference%5C%5C0002570113.html%22%20%5Cl%20%22rfLink14rf0075)* [New York: W.W. Norton; 1932.](file:///D%3A%5C%5Cwomat-filecopy%5C%5CEd-Reference%5C%5C0002570113.html%22%20%5Cl%20%22rfLink14rf0075)

16.[Cannon WB. The James-Lange theory of emotions: a critical examination and an alternative theory.](file:///D%3A%5C%5Cwomat-filecopy%5C%5CEd-Reference%5C%5C0002570113.html%22%20%5Cl%20%22rfLink15rf0080) *[Am J Psychol](file:///D%3A%5C%5Cwomat-filecopy%5C%5CEd-Reference%5C%5C0002570113.html%22%20%5Cl%20%22rfLink15rf0080)*[. 1927;39: 106–124.](file:///D%3A%5C%5Cwomat-filecopy%5C%5CEd-Reference%5C%5C0002570113.html%22%20%5Cl%20%22rfLink15rf0080)

17.[Cannon WB. Voodoo death.](file:///D%3A%5C%5Cwomat-filecopy%5C%5CEd-Reference%5C%5C0002570113.html%22%20%5Cl%20%22rfLink16rf0085) *[Am Anthropol](file:///D%3A%5C%5Cwomat-filecopy%5C%5CEd-Reference%5C%5C0002570113.html%22%20%5Cl%20%22rfLink16rf0085)*[. 1942;44:169–181.](file:///D%3A%5C%5Cwomat-filecopy%5C%5CEd-Reference%5C%5C0002570113.html%22%20%5Cl%20%22rfLink16rf0085)

18.[Sternberg EM, Walter B. Cannon and “Voodoo Death”: a perspective from 60 years on.](file:///D%3A%5C%5Cwomat-filecopy%5C%5CEd-Reference%5C%5C0002570113.html%22%20%5Cl%20%22rfLink17rf0090) *[Am J Public Health](file:///D%3A%5C%5Cwomat-filecopy%5C%5CEd-Reference%5C%5C0002570113.html%22%20%5Cl%20%22rfLink17rf0090)*[. 2002;92:1564–1566.](file:///D%3A%5C%5Cwomat-filecopy%5C%5CEd-Reference%5C%5C0002570113.html%22%20%5Cl%20%22rfLink17rf0090)

19.[Richter CP. On the phenomenon of sudden death in animals and man.](file:///D%3A%5C%5Cwomat-filecopy%5C%5CEd-Reference%5C%5C0002570113.html%22%20%5Cl%20%22rfLink18rf0095) *[Psychosom Med](file:///D%3A%5C%5Cwomat-filecopy%5C%5CEd-Reference%5C%5C0002570113.html%22%20%5Cl%20%22rfLink18rf0095)*[. 1957;19:191–198.](file:///D%3A%5C%5Cwomat-filecopy%5C%5CEd-Reference%5C%5C0002570113.html%22%20%5Cl%20%22rfLink18rf0095)

20.[James W. What is an emotion?](file:///D%3A%5C%5Cwomat-filecopy%5C%5CEd-Reference%5C%5C0002570113.html%22%20%5Cl%20%22rfLink19rf0100) *[Mind](file:///D%3A%5C%5Cwomat-filecopy%5C%5CEd-Reference%5C%5C0002570113.html%22%20%5Cl%20%22rfLink19rf0100)*[. 1884;os-IX:188–205.](file:///D%3A%5C%5Cwomat-filecopy%5C%5CEd-Reference%5C%5C0002570113.html%22%20%5Cl%20%22rfLink19rf0100)

21.[Lange CG. The mechanism of the emotions. In: Dunlap D, ed.](file:///D%3A%5C%5Cwomat-filecopy%5C%5CEd-Reference%5C%5C0002570113.html%22%20%5Cl%20%22rfLink20rf0105) *[The Emotions](file:///D%3A%5C%5Cwomat-filecopy%5C%5CEd-Reference%5C%5C0002570113.html%22%20%5Cl%20%22rfLink20rf0105)*[. Baltimore, MD: Williams and Wilkins; 1885:33–92.](file:///D%3A%5C%5Cwomat-filecopy%5C%5CEd-Reference%5C%5C0002570113.html%22%20%5Cl%20%22rfLink20rf0105)

22.[Sherrington CS.](file:///D%3A%5C%5Cwomat-filecopy%5C%5CEd-Reference%5C%5C0002570113.html%22%20%5Cl%20%22rfLink21rf0110) *[The Integrative Action of the Nervous System.](file:///D%3A%5C%5Cwomat-filecopy%5C%5CEd-Reference%5C%5C0002570113.html%22%20%5Cl%20%22rfLink21rf0110)* [New Haven, CT: Yale University Press; 1906.](file:///D%3A%5C%5Cwomat-filecopy%5C%5CEd-Reference%5C%5C0002570113.html%22%20%5Cl%20%22rfLink21rf0110)

23.[Bard P. A diencephalic mechanism for the expression of rage with special reference to the sympathetic nervous system.](file:///D%3A%5C%5Cwomat-filecopy%5C%5CEd-Reference%5C%5C0002570113.html%22%20%5Cl%20%22rfLink22rf0115) *[Am J Physiol](file:///D%3A%5C%5Cwomat-filecopy%5C%5CEd-Reference%5C%5C0002570113.html%22%20%5Cl%20%22rfLink22rf0115)*[. 1928;84:490–515.](file:///D%3A%5C%5Cwomat-filecopy%5C%5CEd-Reference%5C%5C0002570113.html%22%20%5Cl%20%22rfLink22rf0115)

24.[Papez J. A proposed mechanism of emotion.](file:///D%3A%5C%5Cwomat-filecopy%5C%5CEd-Reference%5C%5C0002570113.html%22%20%5Cl%20%22rfLink23rf0120) *[Arch Neur Psychiat](file:///D%3A%5C%5Cwomat-filecopy%5C%5CEd-Reference%5C%5C0002570113.html%22%20%5Cl%20%22rfLink23rf0120)*[. 1937;38:725–743.](file:///D%3A%5C%5Cwomat-filecopy%5C%5CEd-Reference%5C%5C0002570113.html%22%20%5Cl%20%22rfLink23rf0120)

25.[MacLean P. Psychosomatic disease and the 'visceral brain', recent developments bearing on the Papez theory of emotion.](file:///D%3A%5C%5Cwomat-filecopy%5C%5CEd-Reference%5C%5C0002570113.html%22%20%5Cl%20%22rfLink24rf0125) *[Psychosom Med](file:///D%3A%5C%5Cwomat-filecopy%5C%5CEd-Reference%5C%5C0002570113.html%22%20%5Cl%20%22rfLink24rf0125)*[. 1950;11:338–353.](file:///D%3A%5C%5Cwomat-filecopy%5C%5CEd-Reference%5C%5C0002570113.html%22%20%5Cl%20%22rfLink24rf0125)

26.[Weisfeld GE, Goetz SMM. Applying evolutionary thinking to the study of emotion.](file:///D%3A%5C%5Cwomat-filecopy%5C%5CEd-Reference%5C%5C0002570113.html%22%20%5Cl%20%22rfLink25rf0130) *[Behav Sci](file:///D%3A%5C%5Cwomat-filecopy%5C%5CEd-Reference%5C%5C0002570113.html%22%20%5Cl%20%22rfLink25rf0130)*[. 2013;3:388–407.](file:///D%3A%5C%5Cwomat-filecopy%5C%5CEd-Reference%5C%5C0002570113.html%22%20%5Cl%20%22rfLink25rf0130)

27.Psychosom. Med. 1957;19:180.