

1

Early Iconography of Parkinson's Disease

Christopher G. Goetz

Rush University, Chicago, Illinois, U.S.A.

Parkinson's disease was first described in a medical context in 1817 by James Parkinson, a general practitioner in London. Numerous essays have been written about Parkinson himself and the early history of Parkinson's disease (*Paralysis agitans*), or the shaking palsy. Rather than repeat or resynthesize such prior studies, this introductory chapter focuses on a number of historical visual documents with descriptive legends. Some of these are available in prior publications, but the entire collection has not been presented before. As a group, they present materials from the nineteenth century and will serve as a base on which the subsequent chapters that cover the progress of the twentieth and budding twenty-first centuries are built.

HISTORICAL AND LITERARY PRECEDENTS



FIGURE 1 Franciscus de le Bœ (1614–1672). Also known as Sylvius de le Bœ and Franciscus Sylvius, this early physician was Professor of Leiden and a celebrated anatomist. In his medical writings he also described tremors, and he may be among the very earliest writers on involuntary movement disorders (1).



FIGURE 2 François Boissier de Sauvages de la Croix (1706–1767). Sauvages was cited by Parkinson himself and described patients with “running disturbances of the limbs,” *scelotyrbē festinans*. Such subjects had difficulty walking, moving with short and hasty steps. He considered the problem to be due to diminished flexibility of muscle fibers, possibly his manner of describing rigidity (1,2).



FIGURE 3 William Shakespeare. A brilliant medical observer as well as writer, Shakespeare described many neurological conditions, including epilepsy, somnambulism, and dementia. In *Henry VI*, first produced in 1590, the character Dick notices that Say is trembling: “Why dost thou quiver, man,” he asks, and Say responds, “The palsy and not fear provokes me” (1). Jean-Martin Charcot frequently cited Shakespeare in his medical lectures and classroom presentations and disputed the concept that tremor was a natural accompaniment of normal aging. He rejected “senile tremor” as a separate nosographic entity. After reviewing his data from the Salpêtrière service where 2000 elderly inpatients lived, he turned to Shakespeare’s renditions of elderly figures (3,4): “Do not commit the error that many others do and misrepresent tremor as a natural accompaniment of old age. Remember that our venerated Dean, Dr. Chevreul, today 102 years old, has no tremor whatsoever. And you must remember in his marvelous descriptions of old age (*Henry IV* and *As You Like It*), the master observer, Shakespeare, never speaks of tremor.”



FIGURE 4 Wilhelm von Humboldt (1767–1835). A celebrated academic reformer and writer, von Humboldt, lived in the era of Parkinson and described his own neurological condition in a series of letters, analyzed by Horowski (5). The statue by Friedrich Drake shown in the figure captures the hunched, flexed posture of Parkinson's disease, but von Humboldt's own words capture the tremor and bradykinesia of the disease (6):

Trembling of the hands ... occurs only when both or one of them is inactive; at this very moment, for example, only the left one is trembling but not the right one that I am using to write. ... If I am using my hands this strange clumsiness starts which is hard to describe. It is obviously weakness as I am unable to carry heavy objects as I did earlier on, but it appears with tasks that do not need strength but consist of quite fine movements, and especially with these. In addition to writing, I can mention rapid opening of books, dividing of fine pages, unbuttoning and buttoning up of clothes. All of these as well as writing proceed with intolerable slowness and clumsiness.

JAMES PARKINSON

AN
ESSAY
ON THE
SHAKING PALSY.

BY
JAMES PARKINSON,
F.R.S.

LONDON:
PRINTED BY J. JOHNSON,
ST. PAULS CHURCH-YARD,
AND J. JOHNSON,
ST. BARTHOLOMEW'S-HALL,
1817.

FIGURE 5 Front piece of James Parkinson's *An Essay on the Shaking Palsy* (from Ref. 7). This short monograph is extremely difficult to find in its original 1817 version, but it has been reproduced many times. In the essay, Parkinson describes a small series of subjects with a distinctive constellation of features. Although he had the opportunity to examine a few of the subjects, some of his reflections were based solely on observation.



FIGURE 6 St. Leonard's Church (from Ref. 8). The Shoreditch parish church was closely associated with James Parkinson's life, and he was baptized, married, and buried there.

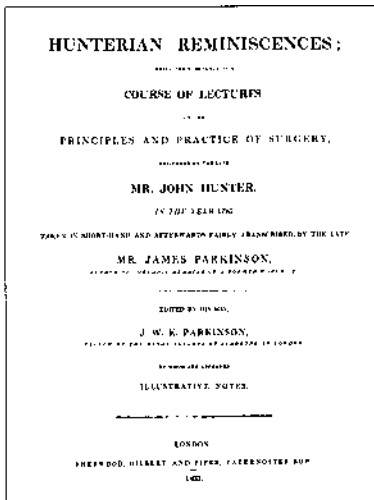


FIGURE 7 (Top) **John Hunter**, painted by J. Reynolds (from Ref. 9). Hunter was admired by Parkinson, who transcribed the surgeon's lectures in his 1833 publication called *Hunterian Reminiscences* (Bottom). In these lectures, Hunter offered observations on tremor. The last sentence of Parkinson's *Essay* reads (7): "... but how few can estimate the benefits bestowed on mankind by the labours of Morgagni, Hunter or Baillie." Currier has posited that Parkinson's own interest in tremor was first developed under the direct influence of Hunter (11).



FIGURE 8 James Parkinson's home (from Ref. 12). No. 1 Hoxton Square, London, formerly Shoreditch, today carries a plaque honoring the birthplace of Parkinson.

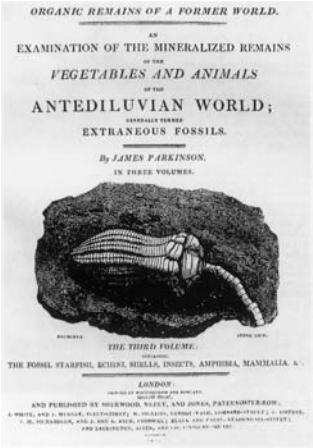


FIGURE 9 James Parkinson as paleontologist (from Ref. 13). An avid geologist and paleontologist, Parkinson published numerous works on fossils, rocks, and minerals. He was an honorary member of the Wernerian Society of Natural History of Edinburgh and the Imperial Society of Naturalists of Moscow.



JAMES PARKINSON

FIGURE 10 Counterfeit portrait of James Parkinson (from Ref. 14). To date, no portrait is known to exist of James Parkinson. The photograph of a dentist by the same name was erroneously published and widely circulated in 1938 as part of a *Medical Classics* edition of Parkinson's *Essay*. Because Parkinson died prior to the first daguerreotypes, if a portrait is found, it will be a line drawing, painting, or print. A written description does, however, exist. The paleontologist Mantell wrote (8): "Mr. Parkinson was rather below middle stature, with an energetic intellect, and pleasing expression of countenance and of mild and courteous manners; readily imparting information, either on his favourite science or on professional subjects."

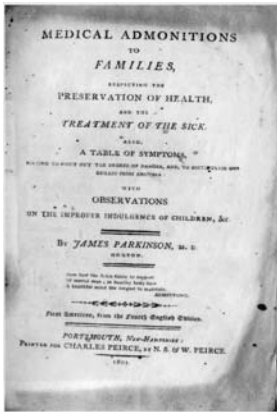


FIGURE 11 One of Parkinson's medical pamphlets (From Ref. 12). An avid writer, Parkinson compiled many books and brochures that were widely circulated on basic hygiene and health. His *Medical Admonitions to Families* and *The Villager's Friend and Physician* were among the most successful, although he also wrote a children's book on safety entitled *Dangerous Sports*, in which he traced the mishaps of a careless child and the lessons he learns through injury (12).

JEAN-MARTIN CHARCOT AND THE SALPÊTRIÈRE SCHOOL



FIGURE 12 Jean-Martin Charcot. Working in Paris in the second half of the nineteenth century, Jean-Martin Charcot knew of Parkinson's description and studied the disorder in the large Salpêtrière hospital that housed elderly and destitute women. He identified the cardinal features of Parkinson's disease and specifically separated bradykinesia from rigidity (4,15):

Long before rigidity actually develops, patients have significant difficulty performing ordinary activities: this problem relates to another cause. In some of the various patients I showed you, you can easily recognize how difficult it is for them to do things even though rigidity or tremor is not the limiting features. Instead, even a cursory exam demonstrates that their problem relates more to slowness in execution of movement rather than to real weakness. In spite of tremor, a patient is still able to do most things, but he performs them with remarkable slowness. Between the thought and the action there is a considerable time lapse. One would think neural activity can only be affected after remarkable effort.



FIGURE 13 Statue of a parkinsonian woman by Paul Richer (From Ref. 13). Richer worked with Charcot, and as an artist and sculptor produced several works that depicted the habitus, joint deformities, and postural abnormalities of patients with Parkinson's disease.



FIGURE 14 Evolution of parkinsonian disability (from Ref. 14). The figures drawn by Charcot's student, Paul Richer, capture the deforming posture and progression of untreated Parkinson's disease over a decade.

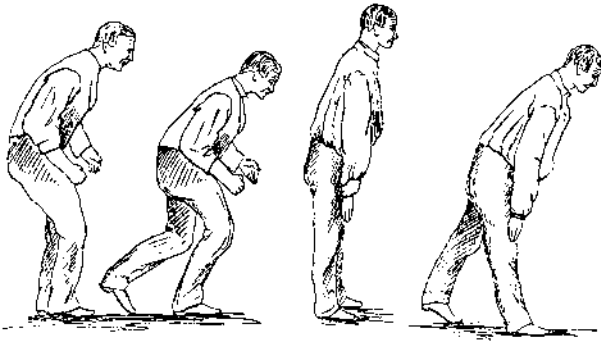


FIGURE 15 Parkinson's disease and its variants. Charcot's teaching method involved side-by-side comparisons of patients with various neurological disorders. In one of his presentations on Parkinson's disease, he showed two subjects, one with the typical or archetypal form of the disorder with hunched posture and flexion and another case with atypical parkinsonism, showing an extended posture. The latter habitus is more characteristic of the entity progressive supranuclear palsy, although this disorder was not specifically recognized or labeled by Charcot outside of the term "parkinsonism without tremor" (4).

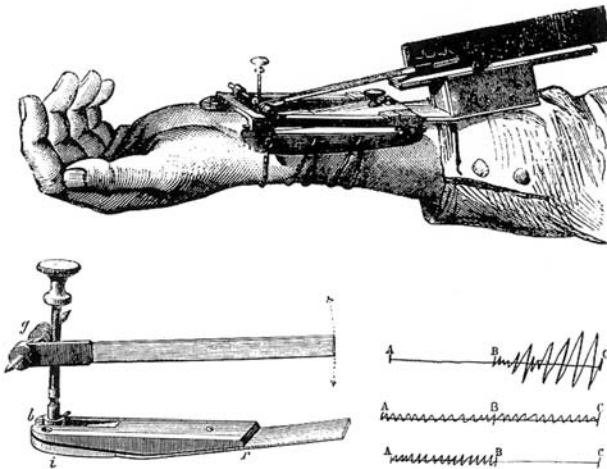


FIGURE 16 Charcot's early tremor recordings. Charcot adapted the sphygmograph, an instrument originally used for recording arterial pulsation, to record tremors and movements of the wrist. His resultant tremor recordings (lower right), conducted at rest (A–B) and during activity (B–C), differentiated multiple sclerosis (top recording) from the pure rest tremor (lower recording) or mixed tremor (middle recording) of Parkinson's disease. (From Ref. 18.)



FIGURE 17 Charcot's sketch of Parkinsonian subject. Pencil sketch of a man with Parkinson's disease drawn by Jean-Martin Charcot during a trip to Morocco in 1889 (from Ref. 19). Referring to the highly stereotyped clinical presentation of Parkinson's disease patients, Charcot told his students (3,4): "I have seen such patients everywhere, in Rome, Amsterdam, Spain, always the same picture. They can be identified from afar. You do not need a medical history." Charcot's medical drawings form a large collection, which is housed at the Bibliothèque Charcot at the Hôpital de la Salpêtrière, Paris.

1^{re} Alcaloïde de Parkinson. 1877
 Prendre immédiatement après chaque repas
 une granule de Hyoscyamine (dont on dispose
 cinq granules) et 4 autres granules de
 Sésu ou de caouchoù. 6 granules par jour le
 second des granules sera fait progressivement
 à 8 et même à 10 dans les 24 heures.
 Ces granules sont pris chez Darány -
 pharmacien. 10 Rue de la ff. Monnaie, à
 Paris.

2^e Prendre immédiatement après chaque repas,
 prendre dans un peu de vin, 4 gouttes de
 la solution de Pearson. 8 gouttes par
 jour.

Paris le 6 mai 1877.
 — Charcot.

D. Legrain.

FIGURE 18 Treatment of Parkinson's disease. Prescription dated 1877. (From Ref. 20.) In treating Parkinson's disease, Charcot used belladonna alkaloids (agents with potent anticholinergic properties) as well as rye-based products that had ergot activity, a feature of some currently available dopamine agonists (20). Charcot's advice was empiric and preceded the recognition of the well-known dopaminergic/cholinergic balance that is implicit to normal striatal neurochemical activity.

Catherine Metzger
 73 Octobre 1868

FIGURE 19 Micrographia and tremorous handwriting (from Ref. 15). Charcot recognized that one characteristic feature of Parkinson's disease was the handwriting impairment that included tremorous and tiny script. Charcot collected handwriting samples in his patient charts and used them as part of his diagnostic criteria, thereby separating the large and sloppy script of patients with action tremor from the micrographia of Parkinson's disease.

OTHER NINETEENTH-CENTURY CONTRIBUTIONS

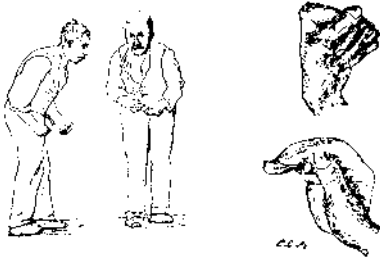


FIGURE 20 William Gower's work. William Gower's *A Manual of Diseases of the Nervous System* shows sketches of patients with Parkinson's disease (left) and diagrams of joint deformities (right) (from Ref. 21). More known for written descriptions than visual images, William Gowers offered one of the most memorable similes regarding parkinsonian tremor: "*the movement of the fingers at the metacarpal-phalangeal joints is similar to that by which Orientals beat their small drums.*" His historic textbook, *A Manual of Diseases of the Nervous System*, included sketches of patients with Parkinson's disease as well as diagrams of the characteristic joint deformities.



FIGURE 21 William Osler. Osler published his celebrated *Principles and Practice of Medicine* in 1892, one year before Charcot's death. As an internist always resistant to the concept of medical specialization, Osler was influential in propagating information to generalists on many neurological conditions, including Parkinson's disease. Osler was less forthcoming than Charcot in appreciating the distinction between bradykinesia and weakness, and he sided with Parkinson in maintaining that mental function was unaltered. Osler was particularly interested in pathological studies and alluded to the concept of Parkinson's disease as a state of accelerated aging (22).



FIGURE 22 Eduard Brissaud. Brissaud was a close associate of Charcot and contributed several important clinical observations on Parkinson's disease in the late nineteenth century. Most importantly, however, he brought neuropathological attention to the substantia nigra as the potential site of disease origin. In discussing a case of a tuberculoma that destroyed the substantia nigra and in association with contralateral hemiparkinsonism, he considered the currently vague knowledge of the nucleus and its putative involvement in volitional and reflex motor control. Extending his thoughts, he hypothesized that "a lesion of the *locus niger* could reasonably be the anatomic basis of Parkinson's disease" (23).

REFERENCES

1. Finger S. *Origins of Neuroscience*. New York: Oxford University Press, 1994.
2. Sauvages de la Croix FB. *Nosologia methodica*. Amstelodami: Sumptibus Fratrum de Tourne, 1763.
3. Charcot J-M. *Leçons du Mardi: Policlinique: 1887–1888*. Paris: Bureaux du Progrès Médical, 1888.

4. Goetz CG. Charcot, the Clinician: The Tuesday Lessons. New York: Raven Press, 1987.
5. Horowski R, Horowski L, Vogel S, Poewe W, Kielhorn F-W. An essay on Wilhelm von Humboldt and the shaking palsy. *Neurology* 1995; 45:565–568.
6. Leitzmann A. Briefe von Wilhelm von Humboldt an eine Freundin. Leipzig: Inselverlag, 1909.
7. Parkinson J. Essay on the Shaking Palsy. London: Whittingham and Rowland for Sherwood, Neeley and Jones, 1817.
8. Morris AD, Rose FC. James Parkinson: His Life and Times. Boston: Birkhauser, 1989.
9. Allen E, Turk JL, Murley R. The Case Books of John Hunter FRS. London: Royal Society of Medicine, 1993.
10. Parkinson J. Hunterian Reminiscences. London: Sherwood, Gilbert and Piper, 1833.
11. Currier RD. Did John Hunter give James Parkinson an idea? *Arch Neurol* 1996; 53:377–378.
12. Robert D. Currier Parkinson Archives legged to Christopher G. Goetz.
13. Parkinson J. Organic Remains of a Former World (three volumes). London: Whittingham and Rowland for Sherwood, Neeley and Jones, 1804–1811.
14. Kelly EC. Annotated reprinting: essay on the shaking palsy by James Parkinson. *Medical Classics* 1938; 2:957–998.
15. Charcot J-M. De la paralysie agitante (leçon 5). *Oeuvres Complètes* 1:161–188, Paris, Bureaux du Progrès Médical, 1869. In English: On paralysis agitans (Lecture 5). *Lectures on the Diseases of the Nervous System*, 105–107, translated by G. Sigurson. Philadelphia: HC Lea and Company, 1879.
16. Historical art and document collection, Christopher G. Goetz.
17. Goetz CG, Bonduelle M, Gelfand T. Charcot: Constructing Neurology. New York: Oxford University Press, 1995.
18. Charcot J-M. Tremblements et mouvements choreiforms (leçon 15). *Oeuvres Complètes* 9:215–228, Paris, Bureaux du Progrès Médical, 1888. In English: Choreiform movements and tremblings. *Clinical Lectures on Diseases of the Nervous System*, 208–221, translated by E.F. Hurd. Detroit: GS Davis, 1888.
19. Meige H. Charcot Artiste. *Nouvelle Iconographie de la Salpêtrière* 1898; 11:489–516.
20. Philadelphia College of Physicians, Original manuscript and document collection.
21. Gowers WR. *A Manual of Diseases of the Nervous System*. London: Churchill, 1886–1888.
22. Osler W. *The Principles and Practice of Medicine*. New York: Appleton and Company, 1892.
23. Brissaud E. Nature et pathogénie de la maladie de Parkinson (leçon 23, 488–501). *Leçons sur les Maladies Nerveuses: la Salpêtrière, 1893–1894*. Paris: Masson, 1895.