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Who was the Red Dean?

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The man who is the topic of this neurognostics question and answer is Jean-Baptiste Bouillaud (1796–1881). Interestingly, in most studies on Bouillaud, his first name is Jean-Baptiste, but he himself used “J. Bouillaud” in various publications, for instance, in his book on fevers from 1826 (see Fig. 1), suggesting that in reality he was called Jean.

He played an important role in the discussion on localization of function in the nineteenth century. Although he is well known, there are remarkably few biographical studies on him. An extensive eulogy was presented in the *Académie de Médecine* by Jules Bergeron (1853–1919), permanent secretary of the *Académie*, and was published in its annals in 1887. He pointed to the significance of Bouillaud’s work and the nobility of his character. Abbot J.-D. Matkosky (1882) provided many details about Bouillaud’s life in the region where he was born. Perhaps the most complete biography in English is that of John Davy Rolleston (1873–1946), published in 1931 in the *Proceedings of the Royal Society of Medicine* in England.

Bouillaud (see Fig. 2) was born on September 16, 1796, at Bragette, a village near the city of Angoulême, about 130 km northeast of Bordeaux in France. In 1814, he went to Paris for his medical studies, but, abhorred by the sight of operations, he quickly quit and enlisted as a hussar, having great admiration for Napoleon Bonaparte (1769–1821). After Napoleon was defeated at Waterloo in June 1815, Bouillaud resumed his medical studies in Paris. He was a student and close friend of Guillaume Dupuytren (1777–1835) and also a student of François Magendie (1783–1855). He became an intern in 1818 and finished his studies with a thesis titled *Essai sur le diagnostic des anévrysmes de l’aorte et spécialement sur les signes que fournit l’auscultation dans cette maladie* [Essay on the diagnosis of aneurysms of the aorta and especially on the signs that provides auscultation in this disease] (Bouillaud, 1823). He started his career as an assistant to René-Joseph-Hyacinthe Bertin (1757–1828) at the Hôpital Cochin, also helping him with the publication of his book on heart diseases in 1824: *Traité des maladies du coeur et des gros vaisseaux* [Treatise on diseases of the heart and the large vessels].

He married in 1824.¹ At the relatively young age of 30, he was elected in 1826 as member of the *Académie de Médecine*. In 1831, he was appointed to the chair of clinical medicine at the Hôpital de la Charité in Paris and soon enjoyed the reputation of an outstanding clinician. Many students followed his courses that were published in 1837 in

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¹We have not been able to find personal details of Bouillaud’s wife.



TRAITÉ
CLINIQUE ET EXPÉRIMENTAL
DES FIÈVRES
DITES ESSENTIELLES,

PAR J. BOUILLAUD,

DOCTEUR EN MÉDECINE DE LA FACULTÉ DE PARIS,
MEMBRE DE LA SOCIÉTÉ MÉDICALE D'ÉMULATION ET DE L'ATHÉNÉE
DE MÉDECINE DE LA MÊME VILLE,
ANCIEN INTERNE DES HÔPITAUX.



Cùm febris per aliam ipsi adjectum morbum nocent
postulatum, atque interitum, imo etiam saepe ab ipso
oriatur, et conservetur; facile intelligit, quomodo referat
adjectum huius morbi eadem, naturamque cognoscere.
Hergesel, Epistola 1370.

A PARIS,

CHEZ J.-B. BAILLIÈRE, LIBRAIRE-ÉDITEUR,
RUE DE L'ÉCOLE DE MÉDECINE, N. 14;
LONDRES, MÊME MAISON,
3, BARRACK STREET, REDDING SQUARE.

1826.

Figure 1. Title page of Bouillaud's (1826) book on essential fevers, indicating that he also published work under the name of "Jean" instead of "Jean-Baptiste."

three volumes: *Clinique médicale de l'hôpital de la Charité*. In 1831, he was one of the founding members of the *Société Phrénologique in Paris*.

From 1842 until 1846, he made a sidestep into politics and became a deputy for Angoulême and a member of the Liberal Opposition. He always voted with the leftists. In the meantime, he continued his work at the medical faculty in Paris. His last major work, *Traité de nosographic médicale* [Treatise on medical nosography], in five volumes, appeared in 1846. In 1848, he was elected as dean of the medical faculty in Paris but resigned at the end of *that year*. In 1861, Bouillaud became *Membre de l'Institut*, and head of the *Charité*. In 1862, he was elected president of the *Académie de Médecine*, and, in 1868, he became a member of the *Académie des Sciences*. He gave up his chair in clinical medicine in 1865 but continued to attend the meetings of the *Académies*. He became president of the first International Congress of Medicine in Paris in 1867. The following year he was awarded the title of *Commandeur dans l'ordre Legion d'Honneur* [Commander of the Legion of Honor]. In June 1881, he went to live in his property *Les Bergerons*, north of Angoulême. His mind remained lucid until the very last; only weeks before his death he



Figure 2. A portrait of Bouillaud (retrieved from <http://www2.biusante.parisdescartes.fr/img/?refphot=CIPN21514>). © *Bibliothèque interuniversitaire de santé*

participated in discussions at the *Académie de Médecine*. After a short trip to Switzerland, he died on October 29, 1881 at the age of 85 in Paris. Four years after his death, a bronze statue of Bouillaud was unveiled at Angoulême.

Bouillaud was active in different fields of medicine; apart from his well-known work on localization of the language function and his publications on cardiology, he published on hermaphroditism, cholera, encephalitis, cancer, and various forms of fever.

Bouillaud (1868) compiled a detailed overview (over 80 pages) of his titles and works when he was a candidate for the Academy of Sciences.

Cardiology

According to Rolleston, one may describe Bouillaud's contributions to cardiology under six headings: (1) He produced the first description of the endocardium and endocarditis. (2) He described the "law of coincidence" in 1836, stating that in the great majority of cases of acute generalized febrile articular rheumatism, there exists a variable degree of rheumatism of the fibrous tissue of the heart. This coincidence is the rule and the noncoincidence is the exception. (3) He used accurate measures to weigh and measure

the heart and provided the first extensive anatomical and physiological description of the heart. (4) Whereas Laennec (1781–1826) introduced auscultation of the lungs with the stethoscope in 1819, it was Bouillaud who pointed out its relevance for examining the heart. (5) He described various new physical signs connected with the cardiovascular system. Among these, Rolleston mentions the *bruit de diable* or venous hum. Along with cardiologist Pierre Potain (1825–1901), he performed studies of “heart sounds” involving the differentiation between normal and abnormal heart sounds. (6) He described in detail various congenital cardiac diseases that he associated with either developmental arrest or fetal endocarditis.

In his work on diseases of the heart, *Traité clinique des maladies du coeur* (1835), by some regarded to be his most important publication, Bouillaud contributed significantly to our understanding of the cardiac damages that may be caused by rheumatoid arthritis. Other investigators had previously noted the relationship between rheumatism and heart disease, but Bouillaud (1836) was the first to formulate his “law of coincidence” in his *Nouvelles recherches sur le rhumatisme articulaire aigu en général et spécialement sur la loi de coincidence de la péricardite et l’endocardite avec cette maladie* [New studies on acute articular rheumatism in general and in particular on the law of coincidence of pericarditis and endocarditis in this disease]. He suggested a causal relationship between the infection and the endocarditis. This systemic inflammatory disease is primarily characterized by the presence of an acute joint disorder, acute attacks of fever spaced by remissions, endocarditis, and pericarditis. Onset often follows scarlet fever, streptococcal sore throat, and tonsillitis, infections with the Group A streptococci being considered the principal etiological factor. He emphasized that endocarditis and pericarditis were to be regarded as of coincidental occurrence in acute, but not in chronic, articular rheumatism. His discoveries were confirmed by Karl Albert Ludwig Aschoff (1866–1942) (Aschoff, 1904) and Paul Geipel (1869–1956) (Geipel, 1906) who found the rheumatoid nodules of the heart muscle that are named after them.

Bouillaud was an early advocate of the use of digitalis for treatment of heart ailments. He referred to digitalis as the “opium of the heart.” Bouillaud was also an ardent follower of François-Joseph-Victor Broussais (1772–1838) with respect to the dubious practice of bloodletting. He adhered to this treatment for a surprisingly long time, even when it had become obvious that it was not useful. Rolleston suggests that it might well be that, in particular, this persistence in using this unfounded practice has resulted in a neglect of Bouillaud’s other contributions in the field of medicine. The significant role Bouillaud played in cardiology has been underlined by Silverman (1990).

Bouillaud proposed localization of functions in cerebral cortex

Bouillaud was impressed profoundly by the work of Gall. In 1825, Bouillaud published one of his most cited works: “Recherches cliniques propres à démontrer que la perte de la parole correspond à la lésion des lobules antérieurs du cerveau, et à confirmer l’opinion de Gall, sur le siège du langage articulé” [Clinical studies for demonstrating that the loss of speech corresponds with the lesion of the anterior lobes of the brain, and for confirming the view of Gall on the seat of speech]. He opposed Flourens, who had performed experimental animal lesion studies, and argued that no separate faculties could be ascribed to specific regions of the cortex. Flourens had used strong electrical currents to stimulate

the cortex of dogs that produced convulsions rather than distinct movements of a limb. Bouillaud presented observations of his own and of others of patients with brain lesions, suggesting that, in particular, frontal lesions seem to result in language-production problems. Moreover, Bouillaud noted that loss of speech is not necessarily accompanied by a loss of tongue movement. Bouillaud repeatedly formulated this notion of the localization of a faculty, containing the memories necessary for the articulation of words but with little success in changing prevailing opinions.

Bouillaud used not only his own observations but also many case descriptions of others, in particular, those of Claude-François Lallemand (1790–1854) and Léon Louis, to argue that frontal lesions are often characterized by motoric language disturbances. Bouillaud did not discover the unilateral aspect of aphasia but was correct in pointing to the frontal lobes as the origin of the disturbance. Luzzatti and Whitaker (2001) reanalyzed the 147 cases from Lallemand's casebook to argue that Bouillaud reported selectively from the cases and failed to take into account that there were patients with nonfrontal lesions with language disorders as well as patients with frontal lesions and no language problems. However, his selective choosing of material from Lallemand and Rostan that confirmed his ideas may not have been incorrect, because this was the first time that a higher function could be attributed to just a part of the cerebral cortex: not on the basis of a theory as from Gall but on the basis of the behavior of neurological patients.

Bouillaud's adherence to the localization principle resulted in the well-known discussions, triggered in 1861 in the Anthropological Society by a comment of Bouillaud's son-in-law Ernst Auburtin and a subsequent presentation by Paul Broca to colleagues of the brain of an aphasic man known as Tan. Tan was a man who had lost his speech and whose autopsy showed left frontal infarct. This presentation convinced his colleagues that the principle of localization was not erroneous (Stokey, 1963). Fritsch and Hitzig (1870), using weaker currents just able to be detected on the tips of their tongues, stimulated the cortex of dogs. They observed discrete contralateral movements of paws and legs. These pivotal studies confirmed Bouillaud's concept that there are specialized areas of the cerebral cortex for specific functions.

Bouillaud's animal studies confirmed the concept of localization of function

In 1827, Bouillaud read a paper to the *Académie de Médecine* in which he reported on animal studies on the localization of function; the paper was published in 1830. Bouillaud wanted to demonstrate that Flourens' thesis that the cerebral cortex acts in a unitary way was clearly wrong. Everyone can see that a brain lesion, for instance, in the case of an apoplexy, may result in the paralysis of some body parts but not of others. Some patients may be unable to speak properly but do not show any paralysis of their limbs or even of the tongue since they can use their tongue in other situations normally such as in swallowing. To demonstrate that there is no general loss of intellectual function, he also performed a series of experiments on animals, where he removed the entire cerebral cortex (11 experiments) or only the anterior part (nine studies; Bouillaud, 1830). He performed these studies on animals such as chickens, rabbits, pigeons, and dogs, unaware of the enormous differences between the brains of these species. Being aware of the advantages, but also of the disadvantages of ablation, he also used other methods for examining the role of selective portions of the brain, in particular, cauterization and

irritation. Irritation may come close to the activation of nervous tissue in the normal, nonexperimental situation, he argued. He generally used one animal per experiment. His observations were not very systematic. He essentially provided some observations of the animal following the operation, in particular, with respect to sensations and movements and equilibrium but also on general intelligence.

At the end of this study, he formulated four general conclusions. First, the cerebral lobes are not the site of all sensations; perhaps they are not involved in any because the lobes may be impaired without any apparent effect on sensation. Secondly, there is an essential distinction between sensations and intellectual functions. Thirdly, one may doubt whether the cerebral lobes are the only site of instincts and volition. Fourthly, the anterior or frontal part of the brain is the place for various intellectual faculties and the removal of it results in a state of idiocy, including the loss of the knowledge of objects, of external beings, and of the dominant character of an individual.

Bouillaud noted in the paper on the effects of the removal of the anterior cerebral cortex that he would comment on the effects of posterior ablations in a later lecture. Probably, he was referring to a paper that was published in the *Archives Générales de Médecine* of 1829 (Bouillaud 1829a). There he reported on a series of 18 experiments on animals aimed at studying the role of the cerebellum.

Gall had argued that the cerebellum was involved in the faculty of propagation. Although Bouillaud clearly admired Gall for his general view of the brain and the notion of independent mental faculties in specific areas of the cerebral cortex, he rejected Gall's opinion with respect to that function of the cerebellum. Bouillaud suggested that the cerebellum plays a role in equilibration, station, and progression, agreeing in this respect with Flourens.

Amnesia

In the literature on localization of function, Bouillaud is generally mentioned with respect to the localization of aphasia, but he wrote about amnesia as well. In the *Dictionnaire de Médecine et de Chirurgie Pratiques*, he wrote an essay on amnesia (Bouillaud, 1829b). Like others had stated before him, he noted that, while brain lesions are frequently accompanied by amnesia as one of the symptoms, it may occur as an isolated symptom. He immediately refers to Gall's view that memory is a general faculty of the mind but each of the basic functions, as described by Gall, has its own faculty. Consequently, one may expect dissociations in memory deficits. For instance, a patient may have problems recognizing persons or remembering their names while he has not lost the memory for events. Bouillaud mentioned that memory has been split up in various ways but we do not know the correctness of these proposals. Bouillaud opined that there was a distinction between a memory for objects and for words. He referred to the case description of Pinel, relating to a notary who following apoplexy (hemorrhagic infarction) could not remember names of people around him, nor could he read or write, yet he had an apparently intact memory for other elements. He also mentioned a case described by Cuvier, a man who merely seemed to have lost the use of nouns. Bouillaud argued that in cases of brain lesions, the memory loss was often permanent; but in some cases the loss was temporary. In the latter cases, there were no obvious lesions (*pure nerveuse*), and

there may be emotional alterations. Finally, Bouillaud argues that the memory for words is localized in the anterior lobes as had been claimed by Gall and demonstrated by Bouillaud's study from 1825:

L'auteur de cet article s'est occupé ailleurs de la solution de cet important et difficile problème. Ses recherches l'ont conduit à penser que la perte de la parole et de la mémoire des mots correspondait à une altération des lobules antérieurs du cerveau. Cette opinion, qui confirmerait celle de M. Gall, sur le siège de l'organe du langage articulé, repose sur d'assez nombreuses observations. [The author of this article has devoted himself to this important and difficult problem. His studies have led him to think that the loss of speech and the memory of words correspond with an alteration of the anterior lobes of the brain. This opinion, that would confirm that of M. Gall, on the seat of the organ for articulated language, rests on numerous observations.] (Bouillaud, 1829b, p. 168)

How Bouillaud became known as the Red Dean

In 1848, Bouillaud was elected dean of the faculty of medicine, replacing Mathéo-José-Bonaventure Orfila (1787–1853). But within a year, he resigned and Orfila was reinstated as dean. In order to get some understanding of these somewhat mysterious events, one may read the reports of Lutaud (1925) and Schiller (1979, pp. 24–58) of this episode. It is important to realize that, in February 1848, a revolution started in Paris ending the Orléans monarchy that had begun in 1830. At the beginning of the revolution, Bouillaud replaced Orfila as dean. Orfila was a brilliant chemist and had been dean since 1830, being re-elected five times. He played a significant role in the organization of the medical faculty, its buildings, and its curriculum. After Bouillaud had been elected, he noticed severe financial problems. Lutaud (1925) writes that a sum of 200,000 francs, a gift from Dupuytren for an anatomical museum, had been used for other purposes by Orfila. Convinced that Orfila had acted fraudulently, a committee was charged to investigate these allegations. In July 1830, workers again revolted and there were bloody fights in the streets of Paris. But the government, showing some conservative tendencies, remained adamant; in December, Louis Napoleon was elected as president of the Second Republic. Some politically influential persons organized a rehabilitation of Orfila. This was the motive for Bouillaud to resign as dean.

But what did this have to do with the nickname: the Red Dean? Schiller used the nickname in his biography of Broca. Broca (1886) used the expression of the Red Dean only once, in a letter dated January 11, 1849. We have not found other occasions where the nickname has been used, apart from a few instances where an author apparently referred to Schiller (e.g., Changeux, 1994). It is our impression that Broca, being sympathetic to socialist ideas, used the adjective “red” to refer to Bouillaud's political opinions rather than to some activity during his time as dean. After his resignation as dean, Bouillaud stopped his political activities altogether, so the nickname “Red Dean,” although perhaps appropriate at the time Broca used it, became an inappropriate characterization for the actual person Bouillaud was.

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