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## History of Neurology

# Jean-André Rochoux (1787–1852), a physician philosopher at the dawn of vascular neurology



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### ABSTRACT

Jean-André Rochoux (1787–1852) can be considered the author, in 1812, of the first clinical and neuropathological description of cerebral hemorrhage and ischemia, based on concepts that underlie current vascular neurology. His biography reveals how his thinking was shaped by materialist philosophy, which was also the basis of his rigorous scientific reasoning. Due to his intransigent defence of his philosophical ideas and his outspoken anticlericalism, he was often contradicted and had many opponents who were not inclined to perpetuate his memory after his death, despite the high quality of his medical research. Our biography traces the career of this iconoclastic thinker and physician ahead of his time.

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On 27 April 1852, the *Union Médicale* (Medical Union) informed its readers that Jean-André Rochoux<sup>1</sup> had passed away in Paris on 16 April 1852: “We were saddened and surprised by the silence surrounding the death of Mr Rochoux, our amiable and brilliant confrere, one of the most singular figures of our times. There were no official announcements.”

Does this mean that current-day neurologists have forgotten Rochoux [1]? No, or at least they shouldn't, as in his 1812 thesis (Fig. 1), he rightly affirmed that the etiology of ‘apoplexy’ was cerebral hemorrhage [2]. Prior to this, Giovanni Battista Morgagni (1682–1771) in 1762 had only supposed as much [3]. In fact, Rochoux can be considered to have brought to the fore, in 1658, the neglected discoveries of Johann Jakob Wepfer (1620–1695) [4] and, in 1679, of Théophile Bonet (1620–1689) [5,6], physicians who had already arrived at the same conclusions.

In Rochoux's day early in the nineteenth century, apoplexy was surrounded by a great deal of confusion. François Bayle

(1662–1709), still defending Hippocratic theory in 1677, referred to “the concretion of melancholic humour” [7]. Gregor Nymman (1594–1638) attributed apoplexy to “a sudden obstruction of the torcular Herophili” [8]. Others wrote of sanguine apoplexy, serous apoplexy, gastric apoplexy, asthenic apoplexy and so on. “In the midst of this vacillation of opinions, what physician would not wish to see for himself? [...] Early on, I sensed the need to observe apoplectics and examine their cadavers, with the hope of finally finding solid ground for my judgment” [9]. These few words, written in the introduction to Rochoux's thesis when he was 25, say much about his personality.

“Given his marked preference for science and philosophy, he devoted little time to the civil practice of medicine,” noted Jacques Raige-Delorme (1795–1887) in his obituary [10]. Might this be due to Rochoux's scientific rigor, still rare in his day? Whatever the case may be, his scientific and moral attitudes, which he proudly displayed, explain the ostracism that

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<sup>1</sup> He is often erroneously referred to as ‘Jacques-André Rochoux’, notably at the National Library of France (BnF).

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PROPOSITIONS N.º 76.

SUR

L'APOPLEXIE;

*Présentées et soutenues à la Faculté de Médecine de Paris  
le 14 mai 1812,*

PAR JEAN-ANDRÉ ROCHOUX, d'Argenton,

(Département de l'Indre),

Aide d'Anatomie à la Faculté de Médecine; interne en Médecine  
à la Maison de Santé du faubourg Saint-Martin.

A PARIS,

DE L'IMPRIMERIE DE DIDOT JEUNE,

Imprimeur de la Faculté de Médecine, rue des Maçons-Sorbonne, n.º 13.

1812.

Fig. 1 – Title page of Jean-André Rochoux's 1812 thesis (from the author's private collection).

accompanied him to the grave, which was also due to a variant of xenelasia that excluded him for his opinions regarding ‘neuropathology’ [11]. This is why Raige-Delorme judged Rochoux—unfairly in my opinion—as one who “mixed the most positive studies with the most contestable dogmas” and “put his elite intelligence in service of a systematic idea lacking scientific value”. This judgment barely conceals the political–religious differences that separated the two men.

That said, Raige-Delorme described Rochoux’s character with eloquence: “Gentle, amiable, although inflexible in his opinions; benevolent, although inclined to contradiction and satire; given to clever and malicious criticism of his adversaries, but never injurious, and delighting in provoking the most spirited responses, which he countered most agreeably; with a fine, agile and yet solid mind, though too often paradoxical” [10].

## 1. Multifaceted career and life

Born in Argenton-sur-Creuse on 27 May 1787, Jean-André Rochoux was sent by his father, a postmaster, to Paris in 1804 to attend medical school. Already an *interne* (house officer) in the Paris hospitals by 1807, he spent time at a hospital for venereal diseases (later Hôpital Cochin), then at the Hôpital des Enfants Malades before working at another small Paris hospital, Maison municipale de santé du faubourg Saint-Martin, where the chief surgeon and obstetrician was Antoine Dubois (1756–1837). After passing the 1811 entrance exam, he was made an anatomy assistant at the Faculty of Medicine. Using material collected during dissections, he helped his friend and colleague Jean Rivière, who was near death, to prepare his thesis, *Dissertation sur l’apoplexie sanguine* (Fig. 2) [12]: “For my deceased friend Rivière, I had written a dissertation containing the basis for the ideas I would later develop concerning apoplexy”. Rivière’s thesis can be considered an initial version of his own, defended on 14 May 1812 and entitled *Propositions sur l’apoplexie*. Revised and expanded into book form in 1814, Rochoux’s thesis was praised for providing new approaches by Jean-Eugène Dezeimeris (1799–1851) in his article *Aperçu des découvertes faites en anatomie pathologique* in July 1829 [13]. (We will return to Rochoux’s thesis after presenting the medical–philosophical context underlying his work.)

As his Paris medical practice provided him little recognition or income, Rochoux had himself appointed a “government physician in Martinique” in August 1814 [14]. He then worked at the military hospital in Pointe-à-Pitre (Guadeloupe) until 1819 as *médecin en chef du corps d’armée de La Grande Terre*. “It was there that he compiled his observations on yellow fever in the West Indies; after returning to France, he used them to publish a very good monograph” [9]; Rochoux concluded therein that yellow fever was not directly contagious [15,16]. Having established his reputation in infectious pathology, he was tasked by the government in 1821 with investigating an epidemic in Catalonia. However, upon learning that the disease was extremely contagious, he refused to enter Barcelona, where the population had been decimated; he was thus accorded little sympathy and even called a coward by some commentators in Paris. He baptized the disease ‘typhus

amaril or yellow typhus’ [17], thereby refuting the diagnosis of ‘yellow fever’.

In 1824, Rochoux successfully passed the *agrégation* (civil service) exam in medicine and was named to the Central Office (*Bureau central*) of the Paris Hospitals in 1831. In January 1838, he was appointed to the Chair of Hygiene at the medical school (he had hoped to obtain the Chair of Clinical Medicine) [18] after defending his thesis on the causes of adulteration in alcoholic beverages, in which he proposed a new method for detecting and correcting the problem [19]. Elected an associate member of the *Académie royale de médecine* in 1823, then a full member in 1835 (pathological anatomy section), he was named a physician at the infirmary of the Hospice de Bicêtre in 1830. He never married but remained at the infirmary, “shut away for more than fifteen years, until he retired in 1848, only coming to Paris for sessions of the *Académie de médecine*, which he followed with great regularity, and for certain social duties” [10]. Very active in the Academy, “he had something to say in nearly every discussion” [10].

Suffering from bladder stones, he died a terribly painful death during an episode of fever with probable septicemia on 16 April 1852. According to Raige-Delorme, “His suffering was sometimes so intense that he cried out in pain, but his natural serenity and his passion for his work remained constant” [10].

## 2. Rochoux, Epicurean and materialist philosopher

Rochoux is one of the forgotten figures of nineteenth-century French materialism. In 1836, he expressed this guiding principle: “The satisfaction that comes from understanding causes is certainly one of the most powerful motivations in man’s cultivation of the sciences and his perseverance with his studies” [20]. Rochoux wrote a dissertation for a competition organized in 1839 by the *Académie des sciences morales et politiques*. In response to the proposition of the spiritual philosopher Victor Cousin (1792–1867), Rochoux entitled his submission *Examen critique du cartésianisme* [21]. The young Charles Renouvier (1815–1903), a recent graduate of the Ecole polytechnique, began his career as a philosopher by winning the competition. But whereas he attempted a kind of symbiosis of all known philosophical schools to offend none of them, especially not the spiritualist school in vogue at that time, Rochoux’s dissertation was characterized by “rigorous and passionate polemic, rather than impartial criticism”, according to a report by Jean-Philibert Damiron (1794–1862) [22]. All of Rochoux’s philosophical writings are in the same erudite vein: *Épicure opposé à Descartes* (*Epicurus vs Descartes*); *Examen phrénologique de la tête d’un supplicié* (*Phrenological examination of a torturer’s head*); *Principes de philosophie naturelle appuyés sur des observations microscopiques* (*Principles of natural philosophy based on microscopic observations*); and *Esquisse de psychologie* (*Outline of psychology*). His medical writings also resembled statements of philosophical belief, which apparently irritated Raige-Delorme.

Rochoux can be viewed as a philosopher in the tradition of the Enlightenment; according to Damiron, his sources included *Le Dictionnaire historique et critique* (*Historical and Critical Dictionary*) by Pierre Bayle (1647–1706) and *L’épicurisme*

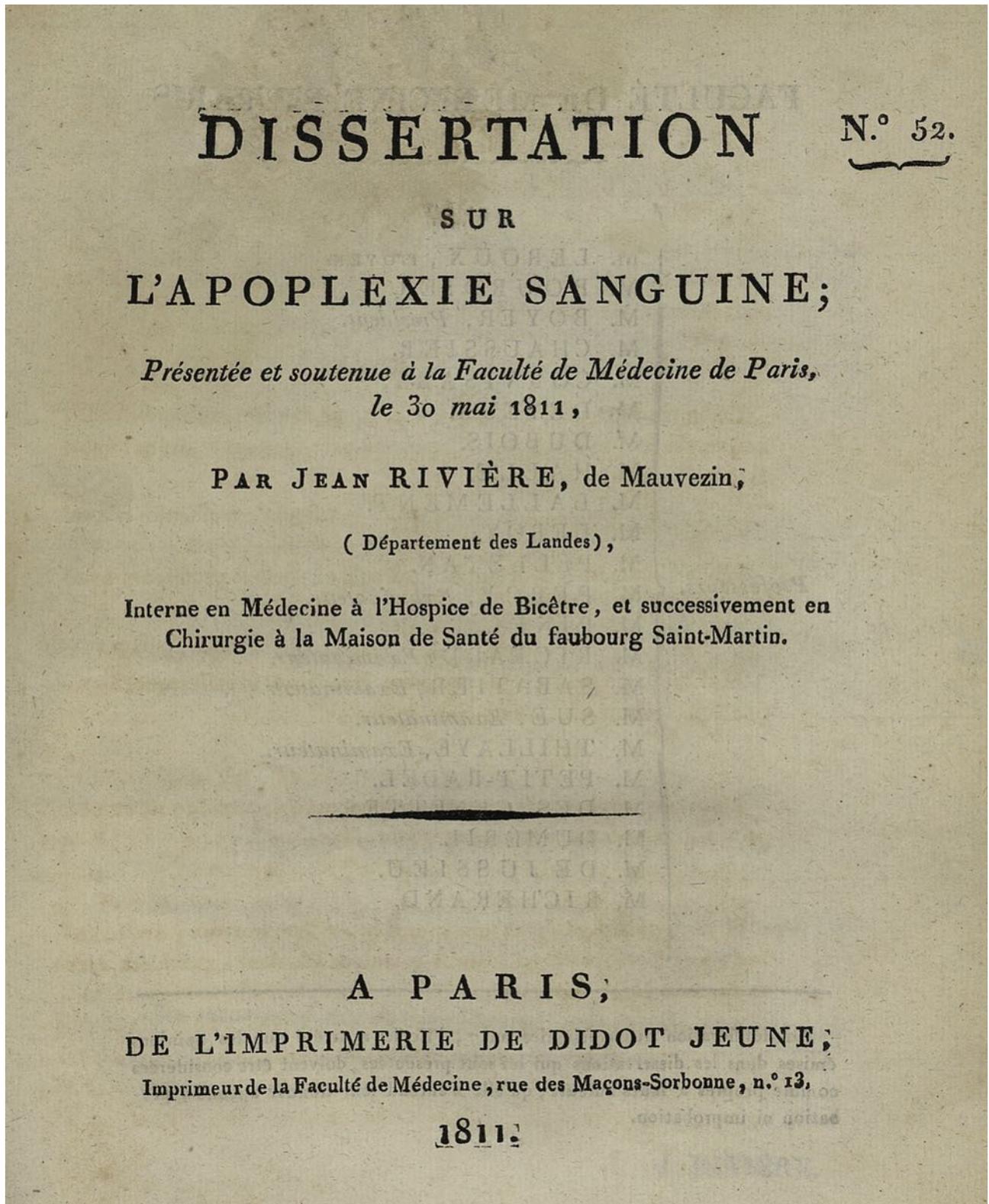


Fig. 2 – Title page of Jean Rivière's 1811 thesis (from the author's private collection).

restauré (*Epicureanism Restored*) by Pierre Gassendi (1592–1655) [23]. Rochoux paid homage to Gassendi—“the emulator, rival or rather antagonist of Descartes”—who dedicated his entire life “to reviving interest in the philosophy of Epicurus” [21]. Gassendi adhered totally to ‘Epicurean’ physics, based on

constituent atoms of matter having the properties of “solidity, diversity of form, indivisibility and spontaneous movement”, making it possible to “show how the action of these same properties is the source of all inanimate or animate natural phenomena” [24]. Rochoux's materialism led him to attribute

the physical world, life and thus thought to matter and movement, a position that German philosopher Ludwig Büchner (1824–1899) would develop in 1866 [25].

But along with this ‘atomism’, Rochoux was an agnostic who defended the idea of spontaneous generation while also criticizing religion and priests, in alignment with eighteenth-century anticlericalism. Opposed to Cartesian spiritualism, he called for studying “biological man”, denying the existence of the soul and any vital spiritual principle: “Vital properties always manifest themselves as a result of purely material conditions” [24]. To explain psychological phenomena, he excluded the assumption of a superior being guiding the soul: “Intellectual or moral acts, generally regarded as the product of a spiritual principle, are the result of bodily actions, and therefore functions of matter” [24]—that is, activities of the brain. This motivated his call to examine the brain, with a view to explaining movement, sensation, consciousness, wakefulness and sleep, in relation to deficits observed following apoplexy accidents. His aim was “to show that all of the operations of human understanding attributed to the action of a soul or spiritual principle independent of the body are simply organic movements; in a word, modifications of innervation” [24].

While Epicurus placed happiness within sensual pleasure, for Rochoux, this pleasure did not entail debauchery, but rather the gentle satisfaction, in the absence of pain, of a penchant for exercising intelligence. In his day (at the beginning of the nineteenth century), the intellectual world was experiencing a conservative, post-revolutionary backlash. The liberal bourgeoisie, won over by scientific progress, disdained the monarchic dictatorship allied to the Church. Among the proletariat, socialist theories were developed, while demands were made to improve workers’ poor living conditions, and strengthen their position relative to the bourgeoisie and the State. Rochoux’s mistrust of bourgeoisie ideology, his rationalism and irreligion pushed him toward radical persuasions, at least until the end of the 1830s. The posthumous opinion of Louis Peisse (1803–1880), a journalist and commentator on medical life at the time, provides some insight into the hostility Rochoux attracted: “He had a real passion for philosophy, but this passion brought with it an irremediable inaptitude and lack of intelligence. Furthermore, he was so naively confident in the force of his mind that he made decisions haphazardly in areas he understood the least, but honestly believed he knew thoroughly” [26].

Nevertheless, Rochoux is now considered a predecessor of both neuropathology and philosophy. In neuropathology, he laid the groundwork for Camillo Golgi (1843–1926) and Santiago Ramón y Cajal (1852–1934) when he wrote: “To determine the degree to which the microscope enabled perceiving the organic texture of the brain, I used it several times to study the organization of thin nerve filaments taken from the calamus scriptorius, and fibrils taken from the pons Varolii. These fragments, so fine to the naked eye, appeared to be composed of thousands of globules of nervous substance, varied in form, supported by extremely fine filaments of which the arrangement, although unknown to us since [it is] very difficult if not impossible to understand, is nonetheless subject to this marvelous regularity, this incredible finesse of execution found in all natural operations” [20]. In

philosophy, he opened the way for Hippolyte Taine (1828–1893), Emile Bertin (1832–?), author of *Matérialisme Physiologique* (*Physiological Materialism*) in 1864, and Jules Soury (1842–1915): “In affirming that psychic processes are a function of matter, one does not merely put forth a simple philosophical axiom, as this affirmation has all the characteristics of a scientific postulate” [27].

A scathing polemicist, Rochoux persistently defended the notion that “every phenomenon in psychology is the product of the brain and has no other cause” [28], hence the need for scientific studies of the brain and Rochoux’s well-supported rejection of phrenology [29], which he described as “this system whereby human understanding comprises a limitless number of faculties, each of which [is] assumed to function by means of a particular cerebral organ”. He counted himself among the holists: “There is no absolute independence in the functions of the nervous system.” For him, “unity of self or of the sense of consciousness” was incompatible with the localization proposed by phrenology [28].

Rochoux’s psychobiological materialism, which he called ‘Epicurean materialism’, was clearly not novel, but it explains his interest in studying damaged brains and the resultant anatomical-clinical correlations: “Depending on the case, diseases can be defined in one of three ways: 1) by the cause, 2) by the symptoms, 3) by anatomical lesions [...]. An anatomical-pathological definition is incontestably preferable to a definition based on a group of symptoms, assigned with varying degrees of discernment; this is only a last resort, to be used provisionally, where nothing better exists. I have thus borrowed from anatomy a definition of which the very precise, limited sense excludes a great many contradictory assertions that are almost all equally reasonable and defensible if, as in the past, apoplexy continues to be defined by symptoms” [28].

### 3. Apoplexy research and the book compiled from his thesis

Writing for Rivière, Rochoux explained: “True medicine is more a matter of in-depth knowledge of the history of diseases than the application, so often frivolous, of bizarre and poorly combined formulas; although this truth has been thoroughly demonstrated by the illustrious author of philosophical nosography [Philippe Pinel (1745–1826)], the common physician remains largely unaware of it” [12]. He began his own thesis, *Recherches sur l’apoplexie* (Fig. 1) [30], with a brief historical note: “It would be as easy as it is useless to pursue so many different or differently modified opinions.” In other words, he maintained that his predecessors had elucidated neither the definition of apoplexy nor its symptomatology or etiology, and his words were a thinly veiled criticism of the book by Antoine Portal (1742–1832), published just the year before in 1811 [31].

Convinced that his first observations of cerebral hemorrhage were the consistent cause of apoplexy, Rochoux set himself the goal of demonstrating that “the distinct difference between the symptoms presented by patients who died from an effusion of blood, and by those who, when opened up, had water or any other damage in the brain, separated these diseases so clearly as to leave no doubt as to their different



*Ambroise Tardieu éditeur & du battoir N° 11.*

*Lith. de Langlumé & de l'Abbaye N° 4.*

**Fig. 3 – Lithograph by Ambroise Tardieu showing a case of apoplexy (from the author's private collection).**

nature". For Rochoux, apoplexy (Fig. 3) associated a rapid onset (albeit not as violent as when the heart is the cause of death) of "the more or less complete loss of feeling and movement" with the presence of an effusion of blood "in a cavity in the substance of the brain itself", the origin of which could be "weakness or poor arrangement in the brain's organization that predisposes it as a location for hemorrhages".

As for the prognosis, "Most older men rarely recover their original health [. . .]. Most often, the disease mutilates those it strikes, leaving them in a state of dependence and imbecility, producing consecutive serous effusions or resulting in organic brain lesions that lead slowly but inevitably to death." Also, his opinion of the available treatments reveals a sincerity that remains appropriate today: "Whatever energy these means are assumed to have, their effect on the material cause of the disease is limited, as manifested by the extreme slowness with which accidents resulting from apoplexy recede. I won't hesitate to affirm it: time produces most of the positive results that the medicines are vaunted for" [30].

Rochoux revised his thesis into a book in 1814 [30], and added material for a new edition in 1833 (Fig. 4) [32]. These works had an entirely different scope: not only did they

include some one hundred case observations combining both clinical aspects and pathological anatomy, but Rochoux also attempted to distinguish the differential diagnoses. He made a point of refuting the concept of 'cephalitis' as the cause of apoplexy. One proponent of this concept, as evidenced by his 1807 thesis, was Pierre-Auguste Dan-Delavauterie (1780-?) [33]—a student of Joseph-Claude-Anthelme Récamier (1774–1852)—who supported the theory of inflammation put forward by François Joseph Victor Broussais (1772–1838), later amplified by Jean-Baptiste Bouillaud (1796–1881) in 1825 [34]. What these partisans of encephalitis observed was probably due to either tardive resorption of hematomas or infarcted territories, or tuberculous meningitis or "general paralysis", which was not nosographically isolated until 1822 by Antoine Laurent Jessé Bayle (1799–1858) [35], whose description of "general paralysis" was later confirmed by Jean-Baptiste Delahaye in 1824 [36].

In 1814, Rochoux introduced the notion of '*coup de sang*' (stroke) and noted that "it is initially more or less impossible to distinguish" from apoplexy [31]. Drawing on the pathophysiology advanced by Wepfer, Rochoux proposed that "circulation may be suddenly obstructed in the vessels of the brain and its envelopes, giving rise to this type of congestion, followed by

**RECHERCHES**  
**SUR L'APOPLEXIE,**  
**ET SUR PLUSIEURS AUTRES MALADIES**  
**DE L'APPAREIL NERVEUX CÉRÉBRO-SPINAL;**  
**PAR J.-A. ROCHOUX,**

MÉDECIN DE L'HOSPICE DE LA VIEILLESSE (HOMMES), AGRÉGÉ A LA FACULTÉ DE MÉDECINE DE PARIS, MÉDECIN HONORAIRE DES DISPENSAIRES DE LA SOCIÉTÉ PHILANTROPIQUE, MEMBRE DE L'ACADÉMIE ROYALE DE MÉDECINE DE PARIS ET DE LA SOCIÉTÉ DE MÉDECINE DE RIO DE JANEIRO, ASSOCIÉ *intime* DE L'ACADÉMIE DE MÉDECINE PRATIQUE DE BARCELONE, CORRESPONDANT DE LA SOCIÉTÉ ROYALE DE MÉDECINE ET DE L'ACADÉMIE DE MÉDECINE DE MARSEILLE, ETC.

Opinionum commenta delet dies naturæque  
judicia confirmat.

CICÉRON, *de nat. Deorum.*

**SECONDE ÉDITION.**

**PARIS.**

**BÉCHET JEUNE,**

**LIBRAIRE DE LA FACULTÉ DE MÉDECINE,**

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**AUX DÉPOTS DE LA LIBRAIRIE MÉDICALE :**

**A BRUXELLES, CHEZ TIRCHER. — A GAND, DUJARDIN.**

**A LIÈGE, DESCER. — A MONS, LEROUX.**

**M DCCC XXXIII.**

Fig. 4 – Title page of the second edition of Rochoux's book *Recherches sur l'apoplexie* in 1833 (from the author's private collection).

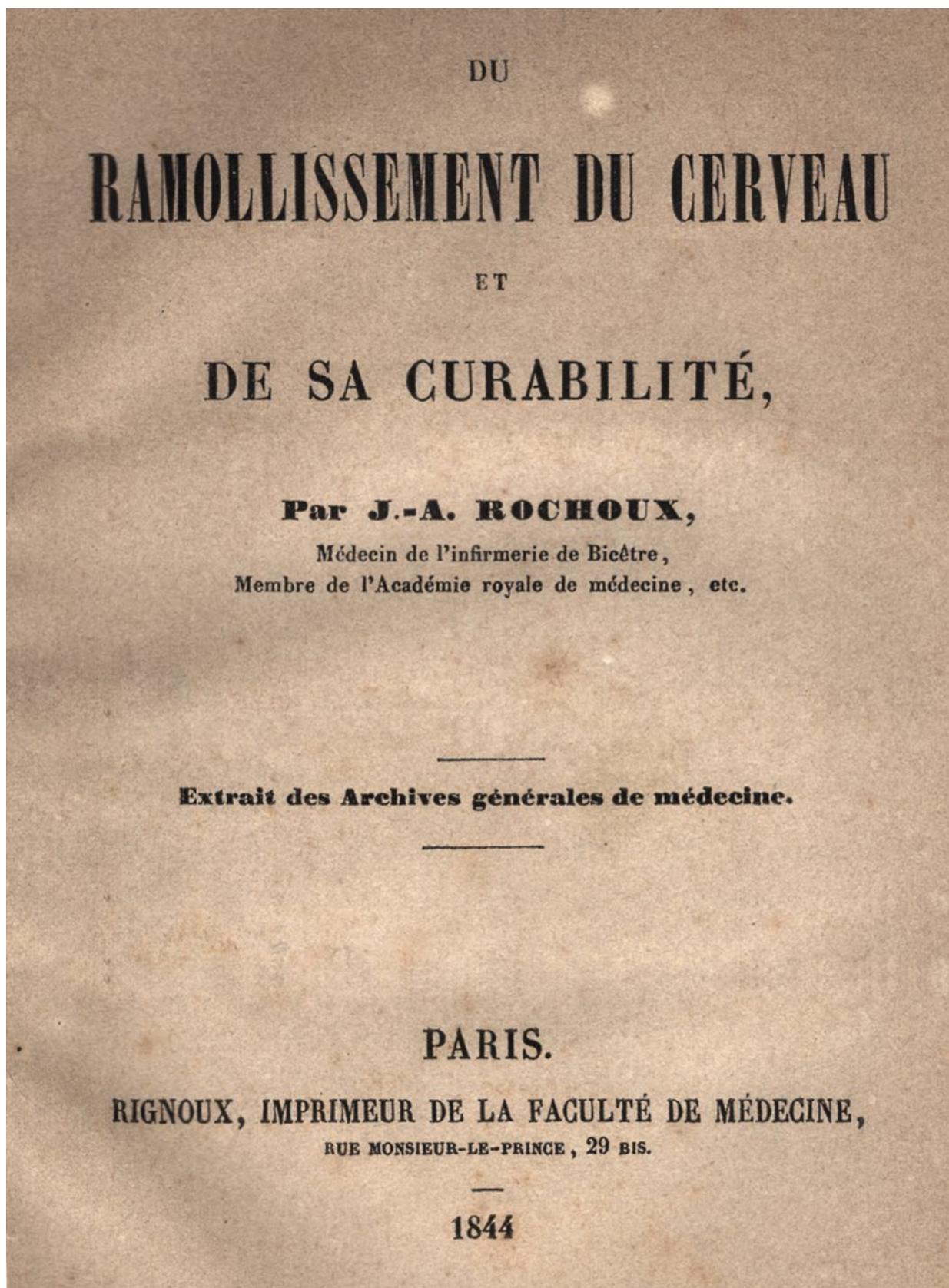


Fig. 5 – Offprint of the first page of Rochoux's article *Upon cerebral softening and its cure*, published in 1844 by the Archives Générales de Médecine (from the author's private collection).

compression, which I exclusively call *coup de sang*". He described the symptoms as "headache, often accompanied by obscured vision, difficulty with pronunciation, weakness and tingling either in all limbs or on only one side, which sometimes seems completely paralyzed. Within a few hours, these same accidents have already lost much of their intensity; only in rare cases do they not clear completely in six to eight days" [31]. This magisterial description of cerebral ischemia is accompanied by a perfectly accurate hypothesis of etiology: "The condition of the heart nonetheless influences very significantly the occurrence of *coup de sang*, whereas it has little effect on apoplexy. This is yet another characteristic that distinguishes the two affections." Finally, Rochoux also provided an observation of *coup de sang* recurring at intervals [31].

In 1844, he noted: "The term 'softening', which I was obliged to use in 1814 as it had already been accepted in scientific language for around six or eight years, is vague in meaning and inevitably allowed very different affections to be considered as similar, or even confused" (Fig. 5) [37]. In fact, he had provided only two observations of "softening" in 1814, both of which were cases of *coup de sang* as a differential diagnosis for apoplexy. In France, it was Louis-Léon Rostan (1790–1866) who, in 1820, completed Rochoux's research on the clinical aspects and prognosis of "brain softening", and also used the term "cerebral congestion" [38], but without conceiving of a carotid or cardiac origin. In fact, the pathophysiology [39] was later approximated more accurately by John Abercrombie (1780–1844) in Great Britain in 1828 [40], Gabriel Andral (1797–1876) in 1829 [41] and Maxime Durand-Fardel (1815–1899) in his 1840 thesis [42].

In the 1833 edition of his *Recherches sur l'apoplexie*, Rochoux added a list of differential diagnoses for apoplexy to facilitate the diagnosis of "diseases originating outside of the skull". His list included "paralysis of half the face", hysteria, asphyxia, syncope and "pernicious fever". As to the prognosis: "Obviously, there is no cure in the strict sense of the word, which implies that the diseased part regains its original condition, rather than being destroyed, without any further problematic effects [...]. This type of outcome must not be accorded to brain softening either; because of the brain's extremely delicate and highly specific texture, this affection first disorganizes and destroys the parts it strikes, and then inevitably spreads to other parts as if by invasion [...]. Pathological anatomy is far from providing any support to those who believe that brain softening is curable" [32].

Finally, the ambiguity of some of Rochoux's sentences suggests a sort of prescience: "Although the recipient of an enormous quantity of blood, the brain does not retain one atom of it combined with its tissue; the apparent purpose of the uninterrupted stream flowing through its mass is only to give rise to the phenomenon of electrical innervation" [32].

#### 4. Entelechy

Claude Lachaise (1797–1881), using the pen name of 'Claude Sachaile de la Barre', concluded his biography of Rochoux [43] by noting that he had provided several articles for the first edition of the 21-volume *Dictionnaire de Médecine d'Adelon* (1821–1828): "Acclimation, apoplexy, disinfection, infection,

marshlands, pathology, malignant pustule, scurvy, and miliary fever" [44]. This indicates that, despite his many detractors, at least some of his peers recognized Rochoux's medical knowledge even if they didn't share his philosophical convictions.

The ambivalent obituary that Raige-Delorme wrote after Rochoux's death ended as follows: "Rochoux deserves praise for using his rigorous observations, to which little need be added, to trace the anatomical and symptomatic description of a disease that had previously not been clearly delimited, and to prove that cerebral hemorrhage involving tissue rupture, for which he reserved the term 'apoplexy', is characterized by symptoms shared with no other disease. His only error was to keep the name of 'apoplexy' for the cerebral disease he sought to distinguish from all others, and to insist on this name, the source of so much confusion both before and after his work." In contrast, Jean-Nicolas Corvisart (1755–1821) was more generous with his praise in a review that appeared in his *Journal de médecine, chirurgie et pharmacie* in February 1815, shortly after the release of the first edition of Rochoux's *Recherches sur l'apoplexie*. He wrote that the book would "provide fruitful reading for physicians, and [would] contribute strongly to leading minds back to ideas more accurate and sound than those which have thus far supported the doctrine of this dreadful disease" [45]. According to this point of view, which I share, Jean-André Rochoux has every right to be recognized as a pioneer of vascular neurology.

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#### Disclosure of interest

The author declares that he has no competing interest.

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- affectuum, ipsorumque causas reconditas revelans. Quo nomine, tam pathologiae genuinae, quam nosocomiae orthodoxae fundatrix, imo medicinae veteris ac novae promptuarium, dici meretur. Cum indicibus necessariis. Genevae: sumptibus Leonardi Chouet; 1679.
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