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Lessons from the past

Étienne Serres (1786–1868), a little-known pioneer of neurology

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INFO ARTICLE

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Étienne-Renaud Augustin Serres (1786–1868) was a physician, anatomist and embryologist who held the Chair of Anthropology at the Muséum national d'histoire naturelle from 1839 to 1855, and the Chair of Comparative Anatomy from 1855 to his death. His interest in anatomy and pathological anatomy led him to be the first to describe some neurological diseases not invidualised before him. Let's pay tribute to this 19th-century polymath, a century who knew so many others, some of whom became far more famous than he.

1. Brief biographical note

Antoine Étienne-Renaud Augustin Serres was born on 12 September 1786 (Fig. 1), the son of Jacques Serres, a physician at the hospital in Clayrac (currently Clairac, in southwest France). In 1803, he went to Paris to study medicine, following in the footsteps of his older brother who died during his studies. Ranking second among the eight students who passed the residency exam for the Hospitals of Paris in 1808 [1,2], he defended his thesis on 01 June 1810. His jury was presided by Joseph Bourdier de la Moulière (1757–1820), *docteur-régent* at the Paris medical school and a physician at Hôtel-Dieu Hospital. His jury also included Philippe Pinel (1745–1826). The title of his thesis—*Essai sur la certitude et l'incertitude en médecine* (essay on certainty and uncertainty in medicine) [3]—drew on the writings of the physician and philosopher Pierre Jean Georges Cabanis (1757–1808). Serres defended the idea that "medicine, based on observation and reason, which are no more than the application of known causes to effects that are also known, is a true science". He considered physicians to be "the ministers of nature"—that is, they only facilitated spontaneous recovery—taking inspiration from Hippocrates's writings all while abandoning the "*esprit de système* [systemic mindset], its greatest enemy". He dedicated his work to his teacher, Bourdier, whom he thanked for treating him for "a cruel disease" (tuberculosis?), which he had contracted during his work on his thesis and which necessitated "a long, difficult convalescence requiring [him] to go where [he] could breathe [his] native air".

Here, a few other milestones in his life. During the Battle of Paris on 30 March 1814, which marked the end of the Empire, he was shot in the leg while tending to the wounded. This left him with chronic osteitis, as the bullet was never removed. Another significant event was his unsuccessful bid to be elected to the legislative office of deputy in his native region in 1848.

Despite the treatment he received from Auguste Nonat (1804–1887) and Pierre-Joseph Manec (1799–1884), he died on 22 January 1868 of a pulmonary infection, in the residence where he lived at the time, above the mineralogy gallery of the Museum of Natural History [3]. While the reasons remain unknown, this unmarried man, reputed to be egotistical and keeping mainly to his coachman and his cook, left a sizeable fortune to be divided between the French Academy of Sciences and the Museum of Natural History in Paris [4].

His career can be broken down into two periods. During the first, he was a clinician and pathologist, named head of anatomical studies at the central anatomy amphitheatre of the Paris hospitals in 1814. Then in 1822, he became chief

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Fig. 1 – Étienne Serres around 1865 (© Museum of Natural History).

physician in a department of La Pitié Hospital, where he lived at that time. It was also the only place he ever practised medicine. He was named Director of the School of Anatomy, run by the Paris hospitals, and inaugurated the so-called Clamart amphitheatre in 1835, which set the standard in its day because of its advanced ventilation and a hygienic wastewater evacuation system [5]. Today it is where the School of Surgery of the Paris hospitals is located, at 7 rue du fer à moulin, a street that used to follow the course of the La Bièvre River (Fig. 2).

In the second period, Serres was named to the Chair of Anatomy and Natural History of Man in 1839 at the Museum of Natural History, a position vacated by the transfer of Pierre Flourens (1794–1867) to the Chair of Comparative Physiology. In his new position, Serres taught comparative anatomy and physiology. In 1865, he himself added the title of professor of anthropology to the name of his chair. After photography was invented by Louis Daguerre (1787–1851) in 1837, Serres brought it to the museum, creating one of the largest collections of anthropological photographs in the world. In all these disciplines, he espoused a personal philosophy that his 20th century detractors perverted to unjustifiably and anachronistically classify him among the apostles of a hierarchical multiplicity of human races and among the promoters of slavery. Because of his innovative work on the study of populations following the French Revolution of 1848, he was a pioneer in sociology and school hygiene [6].

His contemporaries respected his work, as evidenced by his election to the French Academy of Medicine, as an associate member on 16 April 1823, then as a full member on 20 January 1835. He was also elected to the French Academy of Sciences on 28 July 1828 [7], of which he became president in 1841. He attended the sessions of these learned societies assiduously for nearly forty years.

Fig. 2 – Current state of the School of Surgery where Serres's anatomy amphitheatre was located in 1835 (photo OW).

2. First medical writings

Serres's first publication, in 1813, was the result of a work started at Hôtel-Dieu Hospital in Paris with Marc-Antoine Petit (1766–1811): *Traité de la fièvre entéro-mésentérique* (treatise on enteromesenteric fever) [8]. Serres wrote forty-four observations and performed the associated autopsies. His work, which took its cue from the 1804 work of Pierre-Antoine Prost (1770–1832) [9], is considered a first description of what would later be called typhoid fever [10]. Fevers at that time were classified, according to Pinel's nosography, into *fièvres primitives* (spontaneous fevers), *fièvres méningo-gastriques* (meningogastric fevers), *fièvres adéno-méningées* (adenomeningeal fevers), *fièvres adynamiques* (adynamic fevers), and *fièvres ataxiques* (ataxic fevers) [11]. Serres wrote with precision about small intestine lesions, especially near the ileocaecal valve, which could only be assessed macroscopically at that time. Armand Trousseau (1801–1867) would draw on this work when in 1826, he published *Traité de la dothiénentérite* (treatise on dothienenteritis [typhoid fever]) by his teacher from the Touraine region, Pierre-Fidèle Bretonneau (1768–1862) [12]. In 1829, Pierre Charles Alexandre Louis (1787–1872) would bring together all the clinical and anatomical-pathological data, then christen the disease as typhoid fever [13].

In 1817, Serres published *Essai sur l'anatomie et la physiologie des dents, nouvelle théorie de la dentition* (essay on the anatomy and physiology of teeth; new theory of dentition) [14], in which he indicated the existence of dentition of the secondary dentition already present during foetal life, demonstrated the temporary presence of a dental arteriole during primary dentition, and described the distribution of dental nerves. He also worked on the pathophysiology of dental calculus (tooth tartar).

In 1828 at the French Academy of Sciences, Serres presented the manuscript of a work entitled *Traité des maladies organiques de l'axe cérébro-spinal du système nerveux* (treatise of organic diseases of the central nervous system), but this work was never published and seems to have disappeared.

3. Neurological writings

In 1825, Serres published an observation of unilateral paralysis of the cranial nerves that set in progressively: *Histoire d'une altération organique du nerf trijumeau, suivie de la perte de la vue, de l'odorat, de l'ouïe et du goût du même côté* (history of organic damage to the trigeminal nerve followed by loss of vision, smell, hearing, and taste on the same side) [15]. A twenty-six-year-old man, in very poor condition, was hospitalised for frequent, repeated epileptic seizures. There was rapid corneal opacification which made Serres think of experiments on probable sectioning of the sympathetic nerve (called the intercostal nerve at that time). These experiments were first conducted by François Pourfour du Petit (1664–1741) in 1727 [16], then a century later by François Magendie (1782–1855) on animals and leading to the same symptom. He observed the progressive onset, over a few weeks, of unilateral insensitivity in the mouth and tongue, loss of taste on one half of the tongue, loss of smell, and loss of homolateral hearing. During the autopsy, with the help of Jean Georget (1795–1828), Serres found, as he had predicted, changes in the texture and colour of the roots of the trigeminal nerve and its ganglion, extension of a meningeal infiltration of the anterior base of the skull, softening of the pons at the origin of the trigeminal nerve, and poorly described damage to the frontoparietal cortex and the cerebellum. The presence of pulmonary tubercles made it difficult to doubt the tuberculous origin of this meningoencephalitis, one of the first descriptions of unilateral paralysis of the cranial nerves with progressive extension [17], which Raymond Garcin (1897–1971) did not mention in his famous thesis [18]. Recent research does indeed cite tuberculosis among the numerous possible aetiologies [17].

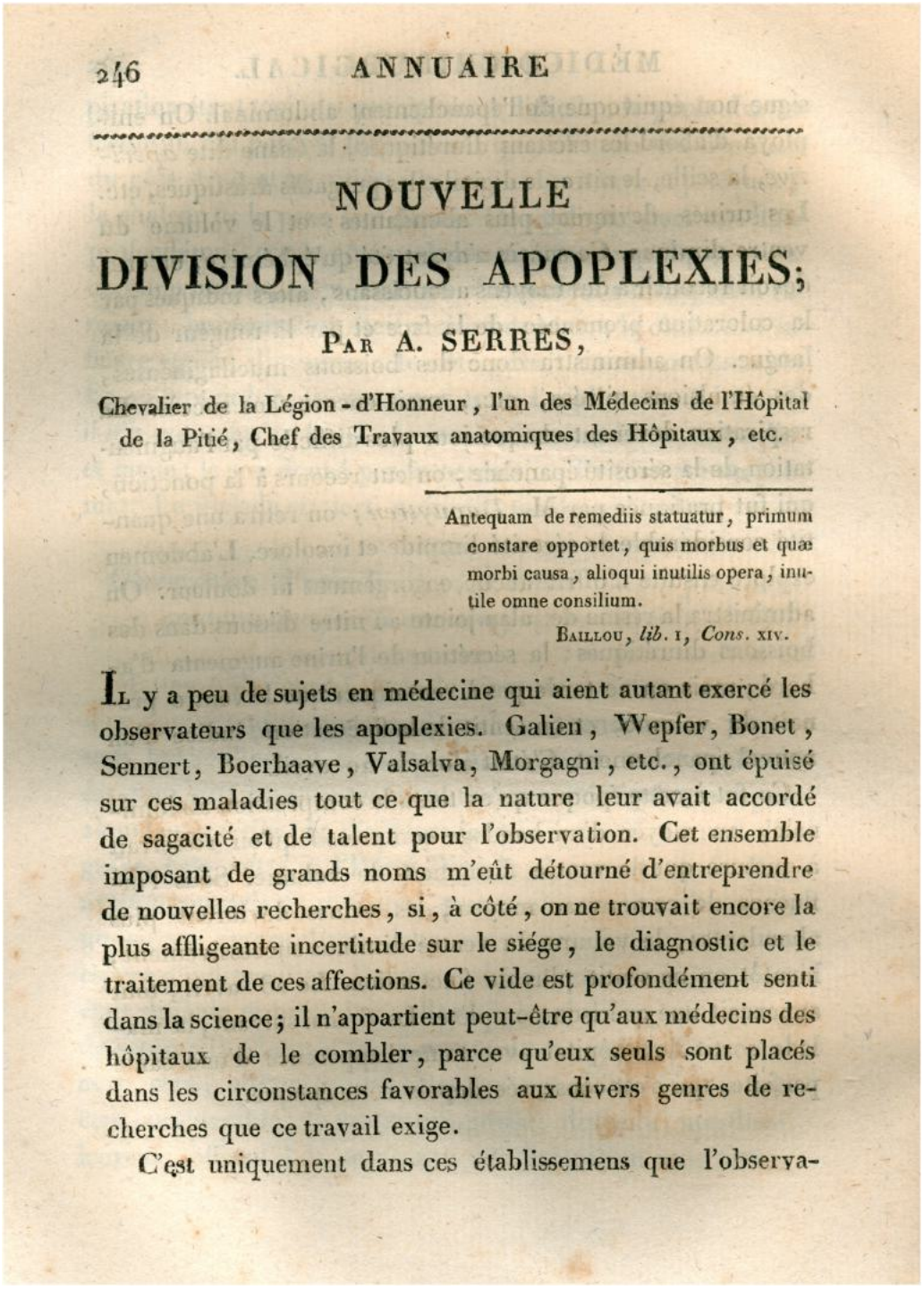
In the second observation of the same article, Serres reported on the medical history of a twenty-year-old man with rapid onset of paraplegia accompanied by horrible pain in his spine —''the patient cries out in an awful way''— that was associated with ascites of increasing volume. During the autopsy, Serres identified tuberculous lesions in the lungs, third dorsal vertebra, and small intestine. He did not mention Percival Pott (1714–1788), who described this clinical picture in 1779 and had described spondylodiscitis as causing paraplegia but without linking it to tuberculosis [19].

4. Cerebellar diseases

Serres considered himself the first to describe intracerebellar haemorrhage in 1822 [20]. He analysed some ten observations, some made by the alienist Jean-Pierre Falret (1794–1870), in which coma with generalised contraction that could lead to opisthotonos was reported. In every case, he observed a prolonged, continuous erection. This was indeed a syndrome, and it specifically indicated, according to him, intracerebellar haemorrhage. To validate his proposition, he drew on the Parisian lectures and writings of Franz Joseph Gall (1758–1828) who, at the same time, attributed the cause of sexual behaviour to the cerebellum [21].

5. Meningeal apoplexy and cerebral apoplexy

Félix Vicq d'Azyr (1748–1794) defined apoplexy as follows: ''This disease comprises the decrease or total suspension of voluntary movements, while those of the heart, arteries, and respiration continue to occur, along with deep sleep'' [22]. In 1819, Serres published his innovative contribution on the conception of apoplexy, elaborated since 1814 according to Jan van Gijn [23], in a journal that seemed to have existed for only one year under this name, *Annuaire Médico-Chirurgical des Hôpitaux et Hospices Civils de Paris* [24] (Fig. 3). Serres observed that despite the multitude of authors who had reported cases of apoplexy, for example Johann Jacob Wepfer (1620–1695), Théophile Bonet (1620–1689), Antonio Valsalva (1666–1723), and Giovanni Battista Morgagni (1682–1771), ''one finds only great uncertainty on the location, diagnosis, and treatment of these affections'' [24]. Curiously, Serres omitted to cite the 1812 thesis of Jean-André Rochoux (1787–1852): *Propositions sur l'apoplexie* (propositions on apoplexy) [25].



246 ANNUAIRE

NOUVELLE DIVISION DES APOPLEXIES;

PAR A. SERRES,

Chevalier de la Légion-d'Honneur, l'un des Médecins de l'Hôpital de la Pitié, Chef des Travaux anatomiques des Hôpitaux, etc.

Antequam de remediis statuatur, primum constare opportet, quis morbus et quæ morbi causa, alioqui inutilis opera, inutile omne consilium.

BAILLOU, *lib.* I, *Cons.* XIV.

IL y a peu de sujets en médecine qui aient autant exercé les observateurs que les apoplexies. Galien, Wepfer, Bonet, Sennert, Boerhaave, Valsalva, Morgagni, etc., ont épuisé sur ces maladies tout ce que la nature leur avait accordé de sagacité et de talent pour l'observation. Cet ensemble imposant de grands noms m'eût détourné d'entreprendre de nouvelles recherches, si, à côté, on ne trouvait encore la plus affligeante incertitude sur le siége, le diagnostic et le traitement de ces affections. Ce vide est profondément senti dans la science; il n'appartient peut-être qu'aux médecins des hôpitaux de le combler, parce qu'eux seuls sont placés dans les circonstances favorables aux divers genres de recherches que ce travail exige.

C'est uniquement dans ces établissemens que l'observa-

Fig. 3 – Apoplexies in Annuaire médico-chirurgical des Hôpitaux et Hospices civiles de Paris, 1819 (OW Collection).

Serres performed multiple experiments on the vivisection of pigeons, dogs, cows, and horses during which he provoked haemorrhage at various levels of the nervous system, triggering paralysis but not loss of consciousness, contrary to apoplexy in humans. In parallel to these experiments, Serres compiled, over seven years, nearly three hundred observations at Hôtel-Dieu and La Pitié hospitals. Using clinical and anatomicopathological analysis of these observations, he conceived the hope of "determining the location of each type of apoplexy by analysing its symptoms". He wanted "to know if effusions outside or inside the encephalon can, or cannot, determine apoplectic symptoms" [24]. Following a long discussion, in which he admitted that "effusions were the effect and not the cause of apoplexy", he set out to distinguish two forms of apoplexy: meningeal apoplexy and cerebral apoplexy.

If the apoplectic was immersed "in a state of stupor", but in response to stimulation, he or she showed no paralysis of the

limbs, and the mouth was not deviated, the disease was located in the meninges. The onset was most often slow and progressive. This form was more frequent in children. Serres's autopsies enabled him to discover meningeal apoplexy without effusions, others with simple serosity, and others still with serosanguinous effusion secondary to arterial rupture or aneurysmal dilation. Effusions containing blood today evoke meningeal haemorrhage, but it is probable that the other cases were tuberculous or syphilitic meningitis, which his contemporaries, for example Isidore Bricheteau (1789–1861) called ''dropsy'' or ''hydropisie'' in 1814 [26], Jean-François Coindet (1774–1834) ''hydrocephalus'' in 1817 [27], and Jean-Louis Brachet (1789–1858) ''hydroceophalitis'' in 1818 [28].

Conversely, cerebral apoplexy, occurring more frequently in ageing adults, made ''a sudden, instantaneous invasion''. He did not fail to mention that, sometimes, the precursory symptoms could have signalled ''numbness on one side of the body or one side of face, and difficulty pronouncing some words preceding the attack'' [24]. He observed that sometimes he heard ''a rustling of the carotids''. Was this a fistula or carotid stenosis? Cerebral apoplexy was recognised by hemiplegia, or paralysis in one arm, or paralysis in one leg, or by a ''double hemiplegia''. After having conducted 172 autopsies, Serres affirmed that, in all cases, he observed ''disorganisation in the lobe on the opposite side of the paralysis'', which could affect ''the medullary part of the lobes'', the striatum, the thalamus, or the pons. He noted that almost constantly, cerebral apoplexy was associated with an enlarged heart due to a left ventricle with thick walls, indicating hypertension, a notion that was unknown at the time.

6. ''Hematomeningitis'', the first description of meningeal haemorrhage

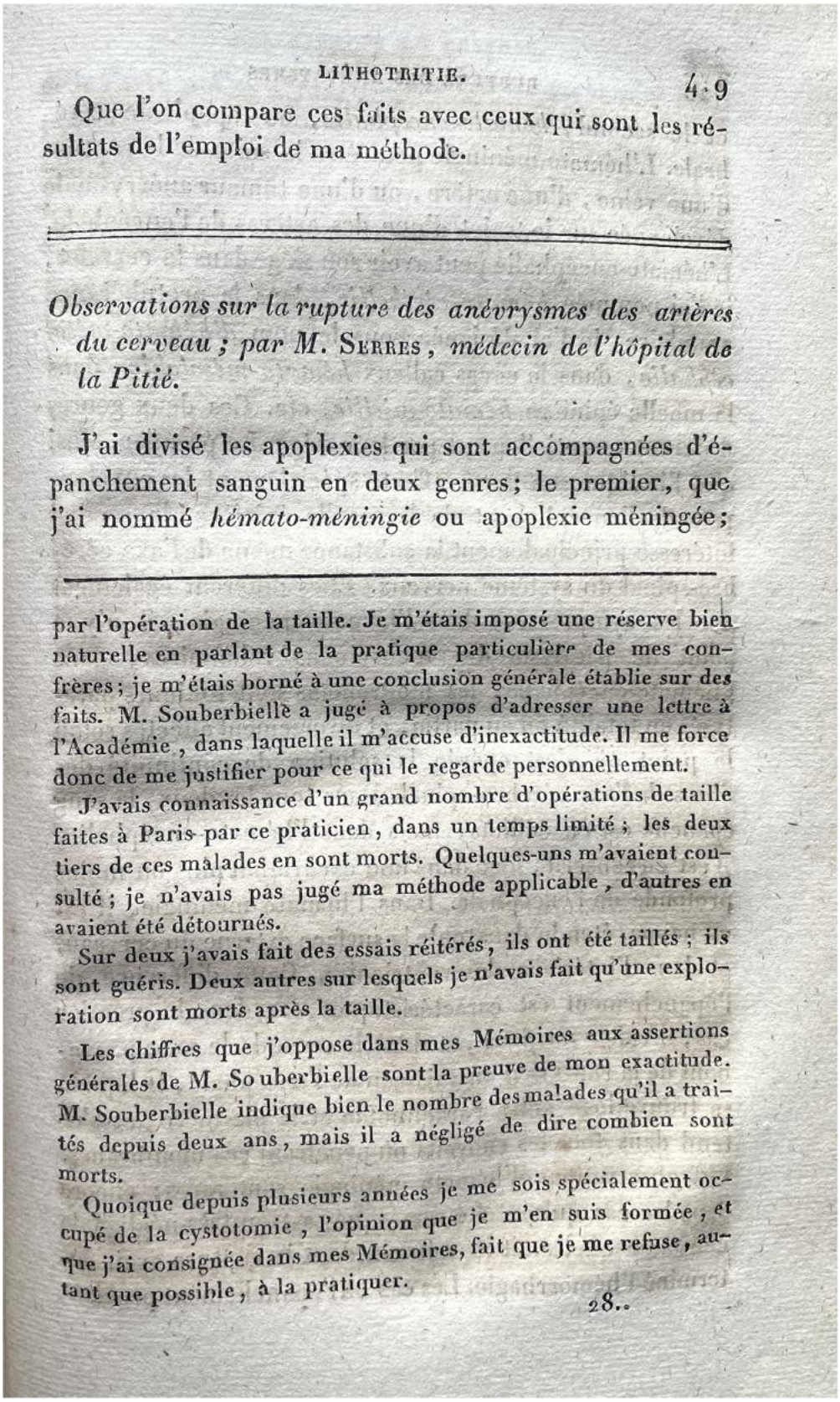
In 1826 Serres entitled an article published in *Archives générales de Médecine*: *Observations sur la rupture des anévrysmes des artères du cerveau* (observations of ruptured aneurysm in the arteries of the brain) [29]. He coined the term ''haemato-meningitis or meningeal apoplexy'' to denote the discovery during autopsy of an effusion of blood ''in the envelopes of the brain and spine''; that is, between the pia matter and the arachnoid (Fig. 4). He attributed this effusion to ''the rupture of a vein, artery, or aneurysmal tumour''. In addition, he distinguished between this haemato-meningitis and haemato-encephalitis, haemato-cerebellitis, haemato-mesocephalitis (pons), haemato-mesolobitis (corpus callosum), and haemato-myelia. Clinically, ''they differ in terms of symptoms: in haemato-meningitis, there is no paralysis of voluntary movements; in haemato-encephalitis, movements are always paralysed in total or in part''. Serres noted that in cerebral haemorrhage, blood clots were circumscribed in a given location, whereas ''in haemato-meningitis, there [was] a layer spread across the entire external surface of the brain and inside the ventricles''. For him, meningeal haemorrhage was rare; ''I know of only two examples'', which he presented in the article cited above, published in *Archives générales de Médecine* in 1826 [29]. ''This condition seems to be caused by the habit of drunkenness''.

The observation of the first patient, named G.B. Espert, was used again from the 1819 article. This 59-year-old man had long complained of ''weightiness in his head and a heaviness (his word) that he did not know how to express''. When he was at La Pitié Hospital recuperating from pneumonia, he learned that one of his children had died and lost consciousness. Afterwards, the fever reappeared and at the end of thirty-six hours, Serres noted a permanent apoplectic state, which led to the man's death. When Serres undertook the autopsy, he suspected ''an arterial rupture inside the skull''. Once he opened it, he observed a significant effusion of blood at the base of the brain and found ''the aneurysmal basilar artery above the pons and near the confluence of the branches it supplies. The aneurysmal dilation was an inch in diameter throughout and the insufflated pocket had the volume of a small hen's egg. It was rounded in shape, slightly flattened on its upper surface''. He observed that the brain and cerebellum were healthy and without any lesions. He wondered about how long this aneurysm had existed and about the symptoms, such as the ''weightiness in his head'', accentuated by physical effort or drunkenness. These symptoms could have suggested the diagnosis while the patient was alive [29].

He added a second unpublished case in 1819. Marie-Nicole Gervais was a 59-year-old merchant who suddenly lost consciousness and remained unconscious for several days. ''Her face was bloodshot as in advanced organic heart conditions; her cheekbones were burgundy in colour''. She remained totally unresponsive, ''although her eyes moved in all directions''. Right facial palsy then appeared right before she died. Serres diagnosed apoplexy without being able to provide further clinical details. Once the skull was opened, he noticed blood effusion between the pia mater and the arachnoid, increasing in size from the hemispheres to the base of the skull. ''A very large clot had filled the interval separating the chiasm of the optical nerves from the middle part of the pons. From there, it had spread to the periphery of the hemispheres and penetrated the large ventricles via the fissure of Bichat, following the path of the vascular plexuses of the pia mater, which were referred to as the choroid plexuses when this membrane was called the choroid membrane of the brain''. Serres discovered a ruptured aneurysm in the anterior communicating artery, ''whose volume was that of a small shotgun bullet'', along with a ''fissure at the extremity of the left cerebral artery''. Brain incision revealed, on the right, ''softening'' lesions in the centrum semi-ovale and ''in the middle part of the radiations of the striatum and thalamus'', explaining the left hemiparesis suspected while the patient was alive [29].

Serres considered himself the first to describe this type of meningeal haemorrhage by aneurysmal rupture, all while noting that ''Morgagni remarked the aneurysmal dilation of the internal carotid and basilar arteries, and Vieussens was the first to find these aneurysmal arteries in the cavernous sinus, but in both cases the aneurysmal sac was intact''. The article did not have any illustrations.

Serres's personal archives conserved at the Museum of Natural History in Paris contain several boxes filled with hundreds of medical observations collected by Serres himself and probably his students. Reading them is difficult because the handwriting is hard to decipher. All the patients who died



LITHOTRITIE. 49

Que l'on compare ces faits avec ceux qui sont les résultats de l'emploi de ma méthode.

Observations sur la rupture des anévrysmes des artères du cerveau ; par M. SERRES, *médecin de l'hôpital de la Pitié.*

J'ai divisé les apoplexies qui sont accompagnées d'épanchement sanguin en deux genres; le premier, que j'ai nommé *hémato-méningie* ou apoplexie méningée;

---

par l'opération de la taille. Je m'étais imposé une réserve bien naturelle en parlant de la pratique particulière de mes confrères; je m'étais borné à une conclusion générale établie sur des faits. M. Souberbielle a jugé à propos d'adresser une lettre à l'Académie, dans laquelle il m'accuse d'inexactitude. Il me force donc de me justifier pour ce qui le regarde personnellement.

J'avais connaissance d'un grand nombre d'opérations de taille faites à Paris par ce praticien, dans un temps limité ; les deux tiers de ces malades en sont morts. Quelques-uns m'avaient consulté ; je n'avais pas jugé ma méthode applicable, d'autres en avaient été détournés.

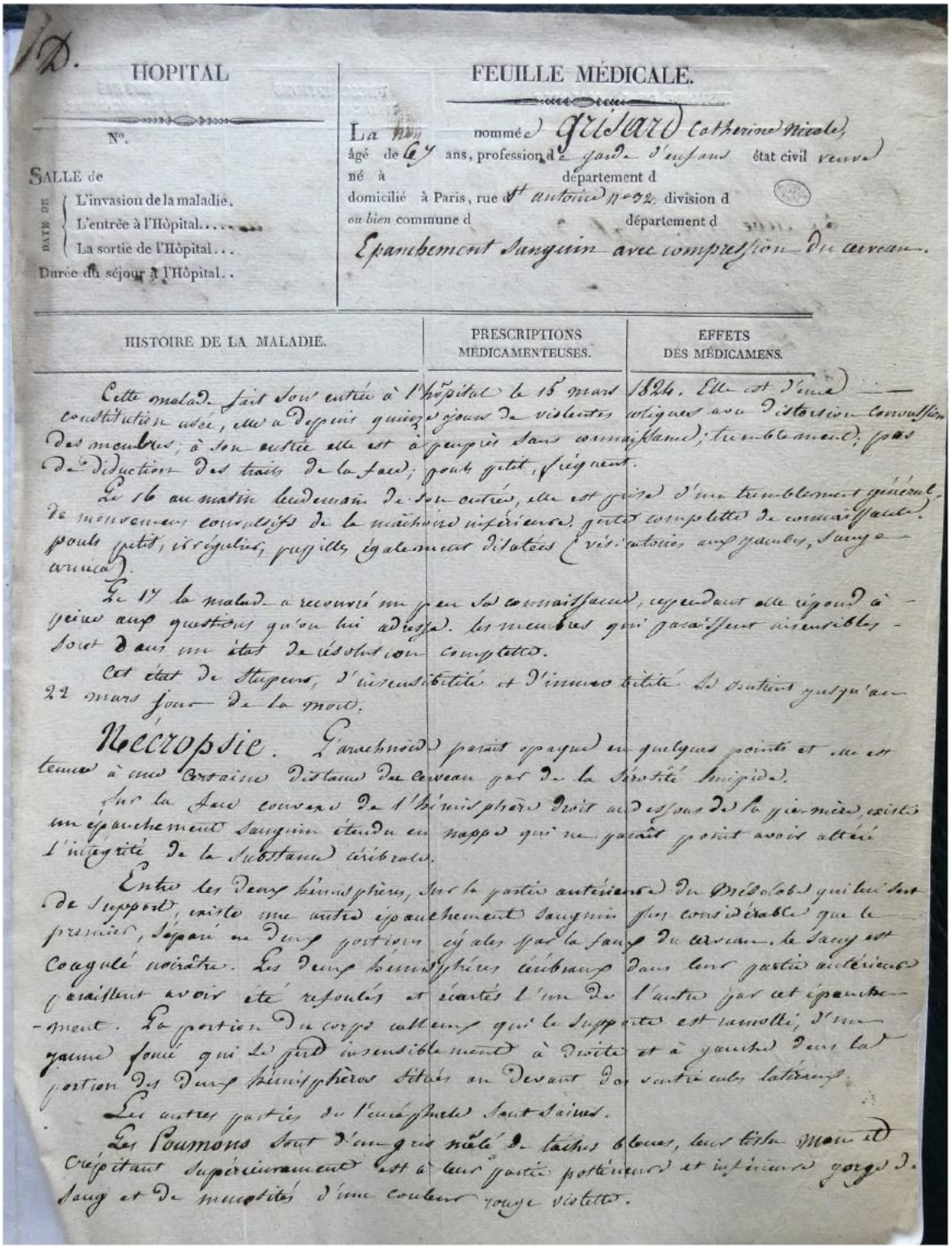
Sur deux j'avais fait des essais réitérés, ils ont été taillés ; ils sont guéris. Deux autres sur lesquels je n'avais fait qu'une exploration sont morts après la taille.

Les chiffres que j'oppose dans mes Mémoires aux assertions générales de M. Souberbielle sont la preuve de mon exactitude. M. Souberbielle indique bien le nombre des malades qu'il a traités depuis deux ans, mais il a négligé de dire combien sont morts.

Quoique depuis plusieurs années je me sois spécialement occupé de la cystotomie, l'opinion que je m'en suis formée, et que j'ai consignée dans mes Mémoires, fait que je me refuse, autant que possible, à la pratiquer.

28..

Fig. 4 – Aneurysmal rupture in *Archives générales de médecine*, 1826 (OW Collection).



HOPITAL

N°.

SALLE de

DATE DE { L'invasion de la maladie. / L'entrée à l'Hôpital..... / La sortie de l'Hôpital... }

Durée du séjour à l'Hôpital..

FEUILLE MÉDICALE.

La nommée Grisard Catherine Nicole,
âgé de 67 ans, profession de garde d'enfans état civil veuve
né à département d
domicilié à Paris, rue St antoine N°92 division d
ou bien commune d département d

Epanchement sanguin avec compression du cerveau.

HISTOIRE DE LA MALADIE. | PRESCRIPTIONS MÉDICAMENTEUSES. | EFFETS DES MÉDICAMENS.

Cette malade fut son entrée à l'hôpital le 15 mars 1826. Elle est d'une constitution usée, elle a depuis quinze jours de violentes douleurs avec distortion convulsive des membres; à son entrée elle est à peu près sans connaissance, tremblement, pas de déduction des traits de la face, pouls petit, frémissement.

Le 16 au matin lendemain de son entrée, elle est privé d'un tremblement général, de mouvemens convulsifs de la machoire inférieure, perte complette de connaissance, pouls petit, irrégulier, pupilles également dilatées (vésicatoire aux jambes, sang-sangsues).

Le 17 la malade a recouvré un peu de connaissance, cependant elle répond à peine aux questions qu'on lui adresse. les membres qui paraissent insensibles sont dans un état de résolution complette.

Cet état de stupeur, d'insensibilité et d'immobilité se soutient jusqu'au 22 mars jour de la mort.

Nécropsie. L'arachnoïde paraît opaque en quelques points et adhérente à une certaine distance du cerveau par de la sérosité limpide.

Sur la face convexe de l'hémisphère droit au dessous de la circonvolution existe un épanchement sanguin étendu en nappe qui ne paraît point avoir altéré l'intégrité de la substance cérébrale.

Entre les deux hémisphères, sur la partie antérieure du Médiolobe qui leur sert de support, existe une autre épanchement sanguin plus considérable que le premier, séparé en deux portions qui s'étendent par la face du cerveau. le sang est coagulé noirâtre. Les deux hémisphères cérébraux dans leur partie antérieure paraissent avoir été refoulés et écartés l'un de l'autre par cet épanchement. La portion du corps calleux qui le supporte est ramollie, d'une jaune fauve qui se perd insensiblement à droite et à gauche dans la portion des deux hémisphères situés en devant des ventricules latéraux.

Les autres parties de l'encéphale sont saines.

Les poumons sont d'un gris mêlé de taches bleues, leur tissu mou et crépitant superficiellement est à leur partie postérieure et inférieure gorgé de sang et de mucosités d'une couleur rouge violette.

Fig. 5 – A handwritten observation by Serres describing meningeal haemorrhage (© Museum of Natural History).

at the hospital were autopsied. Many of them were victims of ''apoplexy''. A mix of other incomplete texts in the archives seem to be drafts of medical articles. Take, for example, this case of meningeal haemorrhage. Catherine Grisard was hospitalised at 67 years old, on 15 March 1827, for a comatose state associated with ''convulsions in the limbs and tremor'' (Fig. 5). Her ''state of stupor, insensitivity, and immobility continued until the 22nd of March, the day of her death''. During the autopsy, ''between the two hemispheres, in the anterior part of the corpus callosum that serves as a support,

Fig. 6 – Étienne Serres around 1830 (OW Collection).

there is another blood effusion, larger than the first and separated into two equal parts by the cerebral falx. The blood is coagulated and black. The anterior part of the two cerebral hemispheres appears to have been repressed, with the effusion separating the hemispheres''. The cause of this probable meningeal haemorrhage was not reported.

7. A second career

Named the successor of Pierre Flourens (1794–1864) at the Museum of Natural History in 1839, Serres introduced teachings that initially involved anatomy but were in fact anthropological and ethnological. His successor, Armand de Quatrefages (1810–1892), undertook to erase the work of Flourens and Serres, by taking credit for the teachings in these disciplines—and successfully so, in the estimation of posterity [30]. Serres (Fig. 6) gave lessons that were ''delivered with verve, often ingenious, always picturesque, sometimes bizarre, but in which anthropology usually played only a very secondary role''. Such was the view of Ernest Hamy (1842–1908), one of his students who was nonetheless a detractor [31]. Although he adhered to the doctrine of fixism, Serres was the first at the museum to introduce evidence that supported the existence of human fossils. He played an active role in developing racial ethnology and human palaeontology. Through his collaboration with Étienne Geoffroy Saint-Hilaire (1772–1844) and his son, Isidore Geoffroy Saint-Hilaire (1805–1861), Serres ambitiously pursued a vast unification of morphological sciences including comparative anatomy, embryology, teratology, palaeontology, and anthropology. One of his most remarkable works is his *Anatomie comparée du cerveau, dans les quatre classes des animaux vertébrés : appliquée à la physiologie et à la pathologie du système nerveux* (comparative anatomy of the brain in the four classes of vertebrate animals, applied to the physiology and pathology of the nervous system), which included by a large atlas with sixteen lithographs. It was published from 1824 to 1826.

A more detailed analysis of this part of his work is beyond the scope of the history of neurology, but the list of titles of his other books is indicative of the considerable work he conducted at the museum during some thirty years, even though current scientific criteria seem to disqualify some of it: *Anatomie comparée des monstruosités* (comparative anatomy of monstrosities) (1826), *Recherches d'anatomie transcendante et*

pathologique (research on transcendent and pathological anatomy) (1832), *Théorie des formations et des déformations organiques* (theory of organic formations and deformations) (1832), and *Précis d'anatomie transcendante appliquée à la physiologie* (précis of transcendent anatomy applied to physiology) (1842).

8. At the French Academy of Sciences

In 1857, Serres was the rapporteur for the dossier entitled ''Localised electrification'' filed by Guillaume Duchenne de Boulogne (1806–1875) with the French Academy of Sciences to compete for the ''new voltaic pile application'' prize, for which the Emperor Napoleon III had provided 50,000 francs. Serres's conclusion is flawless: ''Dr Duchenne has made electricity a means of detailed investigation into the functions of the muscles. He has endeavoured to determine the specific role of each muscle and even that of each of the bundles of compound muscles. This is how he came to produce at will, through the action of electricity directed specifically to the facial muscles, all the mechanical phenomena by which the most diverse passions are reflected in the physiognomy. His expert analysis in this subject area, and the demonstrations through which he has established certainty, have merited and obtained the attention of painters and sculptors'' [32]. The prize was not awarded but in 1863, Serres had Duchenne de Boulogne made a Knight of the French Legion of Honour for the same work.

9. Conclusion

The anatomical studies conducted by Serres, notably his comparative anatomy, enabled him to become an esteemed professor at the Museum of Natural History, an unusual career path for a clinician and physician. His interest in anatomy and pathological anatomy led him to be the first to describe a pathology hitherto unknown, meningeal haemorrhage, by identifying its cause: the rupture of an aneurysm in an intracranial cerebral artery. This contribution to neurology justifies shining a spotlight on his unfairly forgotten work.

Statement of ethics

This work required no approval from an institutional review board and was prepared in accordance with ethical guidelines of the journal.

Disclosure of interest

The author declares that he has no competing interest.

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