

## Who says this is a modern disorder? The early history of attention deficit hyperactivity disorder

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### Abstract

Attention-deficit hyperactivity disorder (ADHD) is a complex, heterogeneous and multifactorial neurodevelopmental disorder characterized by persistent symptoms of inattention, hyperactivity and impulsivity. Although the first clinical description of a constellation of symptoms highly resembling to what currently could be diagnosed as ADHD is generally attributed to George F Still in 1902, there are scattered but significant published historical medical, scientific and non-scientific reports, much prior to Still's lectures, of what is currently conceptualized as ADHD. The present report aimed at exploring the early history of ADHD, prior to the 20<sup>th</sup> century in the medical literature and in other historical sources, to provide clinicians, researchers and other professionals with a better understanding of the roots and current conceptualization of this disorder. It is possible to find clues and highly suggestive descriptions of individuals presenting symptoms resembling what is currently defined as ADHD in the literature, in paintings or in the Bible. However, the earliest medical reports of individuals with abnormal degrees of inattention, distractibility and overactivity date from the last quarter of the 18<sup>th</sup> century, included in two of the first textbooks specifically on the subject of mental diseases, published by the German Melchior Adam Weikard and the Scottish Sir Alexander Crichton. During the 19<sup>th</sup> century some eminent physicians from Germany, France or Great Britain, such as Charles West, Thomas C Albutt, Thomas S Clouston, William W, Ireland, John Haslam, Heinrich Neumann, or Désiré-Magloire Bourneville, among others provided clinical depictions of patients that most likely presently would be diagnosed as having ADHD. Whilst some of the children described by Still and his predecessors may have suffered from a variety of neurological and psychiatric disorders, many of these patients showed clear symptoms of ADHD and may present

with comorbid disorders, as it is commonly the case in clinical practice.

**Key words:** Attention-deficit disorder; Hyperactivity; Attention-deficit hyperactivity disorder; Hyperkinetic disorders; History; Concept; 18<sup>th</sup> century history; 19<sup>th</sup> century history

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**Core tip:** Attention-deficit hyperactivity disorder (ADHD) is a highly prevalent neurodevelopmental disorder in children and in adults. Although the conceptualization and diagnosis of this disorder is often controversial it is not a modern invention. There are significant published historical medical, and non-scientific reports of individuals with symptoms of inattention, distractibility and over-activity, prior to the 20<sup>th</sup> century, since the last quarter of the 18<sup>th</sup> century. The present paper explores the early history of ADHD in the medical literature and in other historical sources, to gain better understanding of the roots and evolution of the conceptualization of this disorder.

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## INTRODUCTION

Attention-deficit hyperactivity disorder (ADHD) is the most common childhood neurodevelopmental disorder in childhood and highly prevalent in adults, as well<sup>[1,2]</sup>. Over the recent three decades this complex and heterogeneous disorder, with clearly outlined neurobiological substrates, has been conceptualized as a chronic multifactorial disorder characterized by symptoms of inattention, hyperactivity and impulsivity<sup>[3,4]</sup>. Along the 20<sup>th</sup> century, "minimal brain damage", "minimal brain dysfunction", "minimal brain disorder", "hyperkinesis" or simply the "hyperactive child syndrome" are among the many different terms used to refer to what is currently known as ADHD<sup>[5-7]</sup>. Likewise, the Diagnostic and Statistical Manual of Mental Disorders (DSM) in its third edition, published in 1980<sup>[8]</sup>, introduced the term "Attention-Deficit Disorder with or without hyperactivity", the contemporary term ADHD is relatively new, following the publication of DSM-III-R<sup>[9]</sup>. The other major diagnostic system, the International Statistical Classification of Diseases and Related Health Problems in its current 10th Revision (ICD-10)<sup>[10]</sup> (World Health Organization, 1992), relies on the term "hyperkinetic disorders" to refer to a group of disorders of an early onset and characterized by disturbance of activity and attention with or without

conduct disorder. Partly due to the different terminology used to coin this disorder which actually refer to various entities, but also due to that for decades there has been no unified conceptualization of the disorder, it has existed great controversy in the understanding and even the acceptance of this disorder<sup>[11-14]</sup>.

The first clinical description of a constellation of symptoms highly resembling to what currently could be diagnosed as ADHD is generally attributed to George F Still in 1902<sup>[15]</sup>, many years before the disorder entered the official diagnostic nomenclature. Sir George Frederic Still, a pediatrician who became England's first professor of childhood medicine at King's College Hospital London<sup>[6]</sup>, is particularly acknowledged for his findings and reports of a form of chronic joint disease in children<sup>[16]</sup>, which is currently known as "Still's disease"<sup>[17]</sup>. In his Goulstonian lectures on "some abnormal psychical conditions in children", delivered in March 1902, before the Royal College of London, he described a group of 43 children, which he reported as having what he labelled as an "abnormal defect of moral control"<sup>[15]</sup> (Table 1). He described these children as often being aggressive, defiant, resistant to discipline, as well as excessively emotional or passionate. These children had problems with concentration and sustained attention, as well, and could not learn from the consequences of their actions. The Goulstonian Lectures are commonly considered as the scientific starting point of ADHD history<sup>[18-21]</sup>. However, there are scattered but significant published historical medical, scientific and non-scientific reports, much prior to Still's lectures, of what is currently termed as ADHD. Moreover, it is quite likely that Still's observations and clinical descriptions might have been influenced by the different medical depictions published during the 19<sup>th</sup> century.

In the present report we aimed to comprehensively review the historical and medical evidence of the on children, adolescents and adult individuals with symptoms resembling to what is currently acknowledged as ADHD throughout history, but focusing on the reports prior to the publication in 1902 by George Still of his seminal paper<sup>[15]</sup>, thus prior to the 20<sup>th</sup> century. Exploring the roots of this neurodevelopmental disorder, not only in the medical literature, but also in other historical sources, can aid clinicians, researchers, and other professionals gaining a better understanding of its current conceptualization.

## ADHD in the art and literature

In order to appreciate and understand the present conceptualization of ADHD, it is important to consider the portrayal of the symptoms of inattention and hyperactivity not only in medical books, but also in other historical accounts, including in classical literary texts or in painting masterpieces. Indeed, although for the most part, disruptive behaviors we would now acknowledge as symptoms of ADHD, historically could be attributed to youthful exuberance or a simple lack of discipline

**Table 1** Terminology used in medical reports and textbooks in the 18<sup>th</sup> and 19<sup>th</sup> century to describe symptoms of inattention or hyperactivity resembling to the current concept of attention deficit hyperactivity disorder leading to Sir George F Still clinical descriptions

Ref.	Year	Term
Melchior Adam Weikard <sup>[39,41]</sup>	1775	Attention Deficit ("Mangel der Aufmerksamkeit" or "Attentio Volubilis")
Alexander Crichton <sup>[46]</sup>	1798	Disease of attention
Benjamin Rush <sup>[53]</sup>	1812	A syndrome involving inability to focus attention
Charles West <sup>[55]</sup>	1848	The nervous child
Heinrich Neumann <sup>[67]</sup>	1859	Hypermetamorphosis
Désiré-Magloire Bourneville <sup>[69,70]</sup>	1885	Mental instability
Thomas Clifford Albutt <sup>[487]</sup>	1892	Unstable nervous system
Thomas Smith Clouston <sup>[63]</sup>	1899	Simple hyperexcitability
George F Still <sup>[15]</sup>	1902	Abnormal defect of moral control

or intellect, the different historical and artistic clues may provide solid clues of inattentive and hyperactive individuals throughout history.

Scientists, clinicians and historians have attempted to find examples in the literature, in historical accounts and in retrospective assessments of historical figures of hyperactivity, inattention and other behavioral problems akin to what is currently identified as ADHD. Indeed, albeit the difficulties of retrospective assessments, several reports have suggested that key figures such as Cromwell<sup>[22]</sup>, Mozart<sup>[23,24]</sup>, or Lord Byron<sup>[25]</sup> could have had ADHD. It has been even hypothesized, from descriptions of his disruptive behavior as recorded in the Scriptures that the Apostle Peter might have suffered from ADHD<sup>[26]</sup>. Likewise, Merzon *et al*<sup>[27]</sup> recently suggested that Esau, the first son of Isaac and Rebecca (Genesis, 25:36), Samson, one of the Judges of Israel (Judges, 13:16) and Saul, the first King of Israel (Samuel 1, 9:31) had clear symptoms of executive dysfunction and possibly ADHD in a study that correlated behavioral patterns of biblical characters with symptoms of ADHD and executive dysfunction. Another likely example of what could be identified as a possible ADHD can be found in the Deuteronomy, within the Old Testament, were it advised parents troubled by a stubborn and unruly son to denounce him to the city fathers, so that he might be stoned (Deuteronomy 21: 18-21)<sup>[28]</sup>.

It is common to attribute one of the first medical descriptions of a hyperactive child to Heinrich Hoffmann's story book "Struwwelpeter" or "Slovenly Peter, Straw Peter"<sup>[7,29]</sup>. Indeed, the eponym "Straw Peter syndrome" has been used to refer to ADHD<sup>[30]</sup>. Hoffmann, born in Frankfurt am Main in Germany, was a prolific poet and children's author, as well as a psychiatrist. Among the didactic tales included in his children's book "Struwwelpeter", Hoffmann included the story of "Zappel-Philipp" or "Fidgety Phillip" where he portrayed the case of a child with disruptive behavioral problems who presently could easily be diagnosed as having ADHD, predominantly hyperactive/impulsive presentation, using DSM-5 criteria<sup>[3]</sup>. The author also included the tale of "Hans Guck-in-die-Luft" or "Johnny Look-in-the-Air", where he provided the description of another boy with what nowadays might be diagnosed as ADHD, predominantly inattentive

presentation, using DSM-5 criteria<sup>[3]</sup>, as he described a young boy constantly distracted by external stimuli and highly inattentive over a broad range of activities<sup>[31]</sup>. However, Hoffman's descriptions of impaired children cannot be acknowledged as a medical description of illness, neither his book as a psychiatric text, but rather a collection of 15 stories with colorful drawings for the amusement and mild admonition of ill-behaving children<sup>[28]</sup>. Hoffman actually wrote these stories for a children's book he designed as a Christmas present for his 3-year-old son<sup>[29]</sup>. In any case, Hoffman was a physician, who later founded the first mental hospital in Frankfurt and became a successful psychiatrist<sup>[6,29]</sup>.

Much before Hoffman wrote his children's book, William Shakespeare, the great dramaturge and certainly a unique observer of human nature and behavior, alluded to an individual with serious problems with inattention in his play "King Henry VIII" (Shakespeare, circa, 1613). In the play he made reference to a "malady of attention" by one of his characters<sup>[32]</sup>. It is interesting to note, as well, that he was speaking of an adult individual, not a child.

Another depiction of ADHD is allegedly to be found in Johann Wolfgang von Goethe's masterpiece Faust<sup>[33]</sup>. In the second part of Faust, published in 1832, Goethe described a very peculiar character of a boy, Euphorion, suggestive of presenting ADHD diagnosis, predominantly hyperactive, as he portrayed a persistent pattern of excessive motor activity, constantly coupled with impulsive actions, without any attention to his parents' warnings or any adverse consequences<sup>[33]</sup>.

Additional indirect hints suggesting that children with attention and hyperactive problems existed throughout history can be found in paintings from renowned artists. Indeed, it has been suggested that one of the earliest examples of ADHD can be found in the masterpiece "The Village School" (c. 1670), by the Dutch master Jan Steen. As suggested by Kast and Altschuler (2008)<sup>[34]</sup> in their historical report, the painter portrayed several children who allegedly might be diagnosed as having what currently could be diagnosed with the predominantly hyperactive/impulsive presentation of ADHD. It is possible that Steen solely was reflecting a relatively normal scene of children being children, exaggerating

in play, but the painting contrasts with another piece by Steen known as well as "The Village School", where children obey and behave impeccably<sup>[34]</sup>.

## THE HISTORY OF CLINICAL DESCRIPTIONS OF INATTENTION AND HYPERACTIVITY/IMPULSIVITY DURING OR PRIOR TO THE 19<sup>th</sup> CENTURY

### *Early history of inattention and hyperactivity*

The current conceptualization and clinical characterization of ADHD has evolved through a complex and diverse historical trajectory dating back to Greek times<sup>[35]</sup>. Prior to the distinct personality types described by Galen (131-201 AD), which are only vaguely related to the current definition of ADHD<sup>[32]</sup>, Hippocrates (460-375 BC), almost universally considered the father of modern medicine, provided the earliest report of a condition that appears to be comparable with what is currently identified as ADHD<sup>[36]</sup>. Approximately in 493 BC, he described patients who had "... quickened responses to sensory experience, but also less tenaciousness because the soul moves on quickly to the next impression"<sup>[37]</sup>. Hippocrates attributed the condition to an "overbalance of fire over water" in the patients bodily humors and prescribed as a remedy for such "overbalance" lots of water and a bland diet, barley rather than wheat bread, fish instead of meat, water drinks, and many natural and diverse physical activities<sup>[36]</sup>.

### *Medical descriptions of inattention and hyperactivity in the 18<sup>th</sup> century*

Although there are scattered historical reports of over-active and unruly children, the first medical reports on individuals, children and adults, with abnormal levels of attention, distractibility, and hyperactivity date from the last quarter of the 18<sup>th</sup> century, when the German Melchior Adam Weikard and the Scottish physician Sir Alexander Crichton published two of the first textbooks specifically on the subject of mental diseases. Both treatises included a conceptualization of attention and descriptions of individuals with abnormal degrees of attention, distractibility and overactivity. However, over a century before Weikard and Crichton published their works, in the 17<sup>th</sup> century, the English philosopher and physician John Locke, who published the earliest modern essay on child education<sup>[38]</sup>, although he did not directly address ADHD-symptoms, Locke actually described a perplexed group of young students who, try as hard as they could, would not keep their mind from straying<sup>[35]</sup>.

The German physician Melchior Adam Weikard (1742-1803) studied physics, philosophy and medicine in the University of Würzburg, and in 1763<sup>[39]</sup>. He began his practice as a physician in Fulda, where he was a prominent physician and eventually became Professor of Medicine at the University of Fulda. Weikard, who was considered a progressive physician at his times,

published numerous works on medical topics as well as on philosophy and psychology<sup>[40]</sup>. Among different relevant posts he held, in 1784 he was appointed as physician-in-ordinary to the Russian Tsarina Catherine II, also known as Catherine the Great at the imperial court in St. Petersburg<sup>[39,40]</sup>.

Between 1773 and 1775 Dr. Weikard published the first edition of his textbook "Der Philosophische Artz"<sup>[41]</sup>, where he broke with prevailing opinion in suggesting that disorders of emotion and behavior arose from medical and physiological causes, not from astrological or other unscientific and outdated medieval hypotheses, such as witchcraft<sup>[42]</sup>. The book included a chapter on "Attention Deficit" ("Mangel der Aufmerksamkeit" or "Attentio Volubilis") (Table 1), that provided what possibly is the earliest description of ADHD-like behaviors in the medical literature<sup>[39]</sup>, anticipating and strongly resembling the predominantly inattentive presentation of ADHD, as outlined in DSM-5<sup>[3]</sup>.

Weikard described adults and children suffering from a lack of attention as being easily distractible by anything, even by his or her own imagination, as well as lacking perseverance and persistence, overactive and impulsive generally characterized as unwary, careless, flighty and bacchanal. Furthermore, he indicated that inattentive individuals "will be shallow everywhere", they are "mostly reckless", imprudent, and most inconstant in execution<sup>[41]</sup>.

Weikard speculated that the ADHD-like behaviors depicted in his textbook were caused by either a general lack of discipline and stimulation, poor upbringing or child-rearing early in childhood or, more notably for his times, dysregulation of cerebral fibers resulting from over- or under stimulation<sup>[39,42]</sup>. Weikard made the observation that inattention was more common among younger than among older individuals, as is well-known nowadays<sup>[4,43]</sup>. However, contrary to what has been demonstrated in the last 100 years<sup>[3,4]</sup>, he also noted that women were more inattentive than men.

Sir Alexander Crichton (1763-1856) was a Scottish physician and obtained his M.D. from the University of Leiden in The Netherlands, and then completed his studies in Paris, Stuttgart, Vienna, Halle, Berlin and Göttingen<sup>[6,44]</sup>. In addition to a well-known physician, he also became a prestigious chemist and mineralogist, with original contributions to all these fields<sup>[45]</sup>. Between 1804 and 1819 he lived in Russia, becoming the royal physician to the tsar Alexander.

In 1798 he published his influential book "An inquiry into the nature and origin of mental derangement: Comprehending a concise system of the physiology and pathology of the human mind and a history of the passions and their effects"<sup>[46]</sup>. In the second of the three volumes of his inquiry, he included a chapter "On Attention and its Diseases", where he provided a definition of attention and emphasized that the intensity of healthy attention varies within a normal range both between individuals and even within a person at different times<sup>[46]</sup>. Crichton described a disorder characterized by



abnormal degrees of inattention and distractibility and the incapacity to attend with the necessary degree of constancy to any object, and that was associated with unusual levels of impulsivity, restlessness and emotional reactivity<sup>[46]</sup>, almost entirely consistent with the diagnosis for the predominantly inattentive presentation of ADHD<sup>[3,35,47]</sup>. Furthermore, he indicated that the condition “can be born with a person” and that may become evident “at a very early period of life”<sup>[46]</sup>. This feature also appears to be consistent with the current construct of ADHD, as outlined in DSM-5, that among its diagnostic features it includes the requirement that several symptoms have to be present before age 12 years<sup>[3]</sup>.

In accordance with Weikard’s hypotheses, Chrichton believed that attentional problems were a consequence of dysregulated “sensibility of the nerves”<sup>[42,44]</sup>. He also reported that these ADHD-behaviors interfered with education, suggesting as well that children with such problems needed special education intervention, as nowadays is recognized and recommended by consensus and treatment guidelines<sup>[48,49]</sup>. In addition, as suggested earlier by Weikard<sup>[41]</sup> and has been demonstrated in the 20<sup>th</sup> century<sup>[4,43,50]</sup>, Chrichton reported that problems of inattention and distractibility diminished with age. He also indicated that problems with attention were associated with many other mental and physical disorders<sup>[47]</sup>.

The different examples of patients with great distractibility, incapacity of attending, mental restlessness and overactivity provided by Chrichton to describe what he called a “disease of attention”<sup>[46]</sup> (Table 1) could be caused by a variety of etiologies, including a metabolic or an endocrine illness, a head injury or neurological disorders such as epilepsy. However, all symptoms observed and depicted by Chrichton<sup>[46]</sup>, as did earlier Weikard<sup>[41]</sup> can be associated with ADHD diagnostic criteria as defined in the current DSM-5<sup>[3]</sup>.

## HYPERACTIVITY AND INATTENTION IN THE MEDICAL LITERATURE IN THE 19<sup>th</sup> CENTURY

Several descriptions of what can be presently identified as hyperactive children, mostly in the form of case reports, can be found in the psychiatric literature along the 19<sup>th</sup> century. However, as was the case of earlier reports by Weikard<sup>[41]</sup> and Chrichton<sup>[46]</sup>, the predominant feature of psychiatric descriptions of children resembling what is currently conceptualized as ADHD was uncontrollability. Indeed, references to behavioral disturbances in childhood of a similar nature to that seen in hyperactivity disorders can be found in several key psychiatric texts of Maudsley (1867), Ireland (1877), or Clouston (1899), among others.

By 1809, the English physician John Haslam, provided in his book “Observations on madness and melancholy” the description of a young child who from the age of two was indulged, mischievous and uncontrollable, with

a tendency to break things, very oppositional, both at school and at home, and cruel to animals; in addition, the child also had limited attention span<sup>[51]</sup>. This case history has been pointed out as an early example of ADHD, although conduct disorder<sup>[7,35]</sup>, and specific learning difficulties are among the differential diagnoses or comorbidities that may have exhibited the child<sup>[35]</sup>. Only three years later, in 1812, the American physician Benjamin Rush, who was among the members of Congress that signed the Declaration of Independence, and considered to be the “father of American psychiatry”<sup>[52]</sup>, published his book “Medical inquiries and observations upon the diseases of the mind”<sup>[53]</sup>. Rush described “a syndrome involving inability to focus attention”<sup>[32]</sup> (Table 1). Furthermore, he provided the observations on uncontrollable children and adults and speculated on the “defective organization in those parts of the body which are occupied by the moral faculties of the mind”<sup>[53]</sup>.

Sir Henry Maudsley, the British psychiatrist described in his book “The physiology and pathology of the mind” the case of a child “driven by an impulse of which it can give no account, to a destructive act, the real nature of which it does not appreciate: a natural instinct is exaggerated and perverted by disordered nerve centers, and the character of its morbid manifestation is often determined by accidents of external circumstances”<sup>[54]</sup>. This was consistent with reports by Charles West, the eminent pediatrician based in the Great Ormond Street Hospital, who in his Lectures on the Diseases of Infancy and Childhood<sup>[55]</sup> mentioned the emergence of a new type of a difficult child, the “nervous child”, one that is neither an idiot nor insane, although in subsequent editions, he did not develop the topic<sup>[56]</sup>. Moreover, Thomas Clifford Albutt reported such children as having “an unstable nervous system”<sup>[57]</sup>. Likewise, the Scottish physician William W Ireland provided a further description of behavioral disturbance in childhood of a similar nature to that seen in hyperactivity disorders<sup>[58]</sup>.

William James, the prominent American philosopher, psychologist and physician centered some of his extensive work on the study of attention and its characteristics. In his book, the “Principles of Psychology”, he provided the description of what he called “the explosive will”, which may resemble the difficulties experienced by those who today are described as having ADHD<sup>[32]</sup>. He also indicated that “effort of the attention is the essential phenomenon of will”, which inspired Still and other mental health specialists in the 20<sup>th</sup> century<sup>[59]</sup>, and to a certain extent provided the philosophical foundation of what later became ADHD<sup>[60]</sup>.

Another important figure is Sir Thomas Smith Clouston, an eminent Scottish psychiatrist, who served as Physician Superintendent of the Royal Edinburgh Asylum and became the first official lecturer on mental diseases at the University of Edinburgh<sup>[61]</sup>. He was also a prolific writer on the nature of mental illness and theories of treatment. Whilst generally ignored when exploring the history of ADHD, only three years

before Still's description of children with hyperactive behaviors<sup>[15]</sup>, in 1899, he elegantly depicted symptoms of hyperactivity, impulsivity and distractibility that characterize the diagnostic definition of ADHD over the last 50 years<sup>[62]</sup>. Clouston reported in a pivotal paper three cases of what he described as neurotic children who presented, hyper-excitability, hypersensitiveness and mental explosiveness<sup>[63]</sup>. Furthermore, he described the hyper-excitable child as someone who "becomes ceaselessly active, but ever-changing in its activity" and suffers from "undue brain reactivity to mental and emotional stimuli". Such descriptions of what he termed "simple hyperexcitability" (Table 1) show greater resemblance to the current conceptualization of the hyperactive child than the observations of Sir George Still<sup>[62]</sup>. He believed that such conditions were due to an overactivity of the nerve cells in the cerebral cortex, as was demonstrated almost 100 years later<sup>[64-66]</sup>. In addition, Clouston<sup>[63]</sup> outlined a multimodal therapy that included a pharmacological intervention consisting of carefully dosed grains of potassium bromides to treat these children (Table 1).

German and French psychiatrists provided additional examples of disruptive behavior in individuals, resembling what currently is identified as ADHD during the 19<sup>th</sup> century. The German psychiatrist Heinrich Neumann, born in Breslau (now Wrocław in Poland) introduced in 1859 the term "hypermetamorphosis" to refer to some children with inability to stay focused, but also highly volatile in their inclinations, restless, in perpetual motion, unable to sit still, with difficulties to get to sit down<sup>[67]</sup> (Table 1). Neumann also described eloquently the ambiguous feelings these children in their parents<sup>[28]</sup>. The term was later adopted by Wernicke, who was one of his assistants, but exclusively for psychotic children<sup>[68]</sup>.

The emergence in France of the concept of ADHD according to modern terminology may stem from the concept of "mental instability" (Table 1) introduced in 1885 by Désiré-Magloire Bourneville at the Hospital Bicêtre in Paris, following his observations of children and adolescents who had been labeled "abnormal" and placed in medical and educational institutions<sup>[69]</sup>. Dr. Bourneville, who was a pioneer in the medico-pedagogical management of children and adolescents, developed what he termed as a medico-pedagogical approach for children with significant cognitive deficits, psychomotor restlessness, inattentiveness, as well as disobedient and lacking discipline<sup>[70]</sup>. Indeed, some of the descriptions of a heterogeneous population of "mentally unstable" children with an array of behavioral problems provided by Bourneville and subsequently by his disciple Charles Boulanger in his thesis published in 1892 were very much resembling to what is currently identified as ADHD<sup>[69]</sup>. Furthermore, in the early twentieth century, following the notions introduced by Bourneville two other French physicians, Georges Paul-Boncour and Jean Philippe identified the presence of a subgroup of "abnormal" school-children who suffered from a disease entity in its own right that included symptoms of

hyperactivity, impulsivity and inattention<sup>[71]</sup>, that would presently correspond to a diagnosis of ADHD associated with a comorbid oppositional defiant disorder or other conduct disorders<sup>[69]</sup>.

## CONCLUSION

Sir George Still's descriptions in the Goulstonian lectures and the subsequent publication in *The Lancet*<sup>[15]</sup> clearly constitute a significant milestone in the conceptualization of what today is identified as ADHD. Of course, the writings of authors such as Alfred F Tredgold, Franklin G. Ebaugh, Franz Kramer and Hans Pollnow, among many other eminent physicians of the early 20<sup>th</sup> century have laid the foundation and are equally influential in our present understanding and definition of ADHD. However, this highly prevalent neurodevelopmental disorder cannot be fully understood without all the different previous contributions and medical description particularly those from eminent physicians and psychiatrists from the 18<sup>th</sup> and 19<sup>th</sup> century. This highlights that by no means it is modern disorder and as some critics suggest, an invention of pharmaceutical companies<sup>[12,72]</sup>. Indeed, the first pharmacological trials with stimulants for hyperactive children were conducted in 1937<sup>[73]</sup>, almost four decades after Still published his seminal paper. ADHD is the childhood and neurodevelopmental disorder and overall one of the psychiatric disorders best and more thoroughly investigated, but it remains a controversial diagnosis. Critics argue that it is a diagnosis used to label difficult children who rather than ill, present behavioral problems at home and particularly at school that are at the extreme end of the normal spectrum<sup>[6,11,12]</sup>. It is certain that the history of ADHD and ADHD-like behaviors has to be viewed within a broader context, considering not only the medical descriptions, but also the concept of children and the educational status throughout history, particularly in the second half of the 18<sup>th</sup> century. Not only the conceptualization of the child as an individual in its own right emerged during the 18<sup>th</sup> century, but schooling began to be compulsory in many parts of the world during the 19<sup>th</sup> century. So, for instance, in 1870 the Parliament in Britain passed an important Education Act that made school compulsory.

Whilst some of the children described by Still, as is probably the case of some the earlier descriptions included in the present report, may have suffered from a variety of neurological and psychiatric disorders, including conduct disorder, oppositional defiant disorder, learning disabilities, autism spectrum disorders, epilepsy, chorea, among many others, many of these children showed clear symptoms of ADHD and may present with these comorbid disorders, as it is commonly the case in clinical practice. Moreover, as we now fully comprehend, the existence of other comorbid disorders not only does not exclude a diagnosis of ADHD, but often makes the diagnostic process of this neurodevelopmental disorder more difficult<sup>[74]</sup>. In any case, although many of the symptoms and diagnostic criteria of inattention,

hyperactivity and impulsivity are not exclusive to this neurodevelopmental disorder, the characteristic presentation of these symptoms, are typical of the disorder currently known as ADHD, as indicated not only in the solid neurobiological research on this disorder, but on the broad and diverse clinical descriptions published during the 20<sup>th</sup> century and, as outlined in the present report, in the various medical descriptions during the 18<sup>th</sup> and 19<sup>th</sup> centuries.

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