Sigmund Freud was the first to write about cerebral palsy as a nosographic category, uniting various infantile motor deficits of brain origin. He did not ascribe more than a temporary value to the term (infantile) cerebral palsy, but it has become – and still is – an indispensable part of the nosographic system. Nevertheless, it is still easier to explain what cerebral palsy is not than to define it precisely.

Introduction
If a historical study of cerebral palsy (CP) is undertaken, it soon becomes apparent that not only are there several definitions, but also a variety of interpretations. The fact that CP has been known as a clinical entity for over a hundred years (Freud, 1968), and is still to some extent loosely defined (Badawi et al., 1998; Bax, 2001), is surprising and, we think, worth considering.

Freud’s analysis
In clinical practice, the term CP was often used interchangeably with the eponym Little’s disease [after the British orthopaedic surgeon who described spastic diplegia, which he considered to be due to birth complications (Little, 1862)] for many years (Freud, 1968; Russell and Kennedy, 1937; Fanconi and Wallgren, 1950). It was, however, Sigmund Freud [a promising neuropathologist from Vienna who became a prominent psychiatrist (Ferris, 1998)] who first wrote about (infantile) CP1 as a nosographic category, uniting various infantile motor deficits of brain origin (Freud, 1968).

In all previous publications on motor deficit of children, the term CP, if it had already been used, had been written either only in a plural form (Osler, 1987; Sachs and Peterson, 1890) or, if in the singular, only in specific combination with other words as a synonym for a particular motor deficit (i.e. infantile meningeal haemorrhage – cerebral birth palsy, infantile hemiplegia – acute cerebral infantile palsy) (Gowers, 1888). Nevertheless, in the routine clinical practice of the second half of the 19th century, (apparently) static motor deficits of children had to be labelled generally in the sense of a medical diagnosis, for Freud in his monograph on infantile CP wrote that the term infantile CP characterized ‘...what already has been applied over a long period of time to pathological condition in which paralysis is overshadowed or replaced by muscular rigidity or spontaneous muscular twitching.’ (Freud, 1968).

Freud’s concept of infantile CP was broader than that formulated some decades later by other authors. He actually suggested that this term should be applied even to neurological cases in which paralysis was completely absent, as, for example, in children with mental retardation, or where disorders did not manifest themselves permanently, such as epilepsy (Freud, 1968) [what is very close to the concept of (early) brain damage formulated much later (Amiel-Tison et al., 1994)].

Freud probably decided to unite the various motor deficits of children in one nosographic category because he did not find any other alternative to bring more order to the field. This hypothesis is supported by the fact that he had begun studying motor deficits of children separately. First he researched cerebral hemiplegia in co-operation with Oskar Rie (Freud and Rie, 1891). Then, he considered the remaining motor deficits of children. He unified them into one clinical group, termed cerebral diplegias, defined as those manifesting a physical handicap of the whole body (i.e. both sides of the body). Among these, he differentiated four main types: (1) general cerebral stiffness, (2) paraplegic stiffness, (3) bilateral hemiplegia, and (4) general chorea and bilateral athetosis (Freud, 1893). Finally, he covered all these various motor deficits by one nosological entity, i.e. infantile CP (Freud, 1968).

Little’s view
In the mid-19th century William John Little earned the reputation of substantiating the causal relationship between birth complications and disorders of mental and physical development after birth (Little, 1843). His
views on this topic were summarized in the article entitled ‘On the influence of abnormal parturition, difficult labours, premature birth, and asphyxia neonatorum, on the mental and physical condition of the child, especially in relation to deformities’, probably the most commonly cited article on CP, which he addressed to the Obstetric Society. From the three responses published at the end of the article, it is clear that Little logically drew attention to the, at that time, unknown field of injuries to which the nervous system was liable during, and immediately after, birth (Little, 1862). In connection with birth complications, he actually described one clinical picture of non-progressive motor deficit of brain origin, namely spastic rigidity, which, at the end of the 19th century, constituted one of four main clinical forms of such motor deficits in children (Freud, 1968). All the same, no other name has become, and remains, so closely associated with CP than his.

Little versus Freud

Given that Little discussed one clinical form of motor deficits of children, which he never termed CP, nor linked it with other motor deficits of brain origin, his comparatively great influence on the common understanding of CP seems at first sight unwarranted. Little’s clear and objective reply to the immediate response of his contemporaries showed that he did not claim a pioneering position in discovering neurological sequelae of abnormal and premature parturition. When he found no reference to this theme in the works of English medical writers, he referred to Shakespeare, who, universal as he was, did not disappoint him. In the physical character of Richard III, he in fact recognized a kind of deformity which, in his opinion, originated at birth (Little, 1862).

Freud, however, combined all infantile motor deficits of brain origin except rapidly progressive into one nosological entity (Freud, 1968). Certainly, it can be said that Freud’s decision to introduce the unifying concept was prudent, with the concept surviving for over a century. All the same, Freud, who supposed that motor deficits of children would eventually be defined more precisely (preferably aetologically) by new insights into the human nervous system, did not ascribe more than a temporary value to the entity he introduced (Freud, 1968).

From a distance of more than a hundred years, it is obvious that both Little and Freud contributed significantly to the understanding of the natural history of CP. Because Freud studied motor deficits of children approximately 3–4 decades later than Little, the question of priority is not contested. Undoubtedly, Little’s aetiological approach represents one of the great milestones of studying motor deficits of children. This was recognized immediately. By contrast, the value of Freud’s conceptual approach had been growing almost imperceptibly until decades later it was realized that his concept of CP was a great milestone as well.

Attempts to solve the terminological confusion

In the 20th century it became gradually evident that CP was a useful nosographic category, although its terminology was rather confused (Bax, 1964). In the mid-20th century, as at the end of the 19th century, CP represented a clinical entity for some, while for others it was just a general denotation for similar clinical entities (Phelps, 1947; Perlstein, 1952). This lack of consensus became less and less tolerable, for it made scientific study difficult.

The American Academy for Cerebral Palsy (later the American Academy for Cerebral Palsy and Developmental Medicine) coped with this problem in 1953 by inquiring extensively of its members about the nomenclature and classification of CP (Minear, 1956).

Another initiative for re-thinking the terminology of CP in the mid-20th century was taken by two Englishmen, Ronald MacKeith and Paul Polani. Adherents soon began to gather around them, and in 1957 they formed the Little Club (Bax, 1964).

Great contribution but little contemporary influence

The terminological confusion that continued to afflict the field of CP for the first half of the 20th century shows that, with his concept of infantile CP, Freud did not significantly influence his contemporaries. From the viewpoint of the current understanding of CP, which is basically the same as Freud’s, this is surprising.

If the publications on infantile motor deficits of brain origin of the 19th century are read comparatively (Little, 1862; Vogel, 1870; Bastian, 1875; Gowers, 1888; Osler, 1887; Sachs and Peterson, 1890), it seems that Freud’s work on this topic (Freud and Rie, 1891; Freud, 1893; Freud, 1968), being both analytic and descriptive, was too theoretical for his time. He based his work much more on literature review than on his own clinical experiences. If there had not been the
precise descriptions of infantile motor deficits of Jacques Mathieu Delpech, William John Little, William Osler, William Richard Gowers and many others, Freud would not be able to develop his insightful concept of CP. He finished his extensive work in this field with his monograph on infantile CP (Freud, 1968), and then became renowned for psychoanalysis. It overshadowed practically all his other works (Ferris, 1998), perhaps contributing to the lack of influence of his excellent work on CP. In retrospect, this contributed to the persistence of terminological confusion.

**Causal relationship between birth asphyxia and cerebral palsy**

In over 20 years of orthopaedic practice, Little came to the conclusion ‘that the proportion of entire recoveries from the effects of asphyxia neonatorum is smaller than has hitherto been supposed.’ He based his opinion on approximately 200 well-documented personal cases of spasticity with birth complications in their history (Little, 1862). Because he did not use any statistical methods, but only a descriptive comparison with the general opinion of that time, we cannot know how frequent such motor deficit of children were in the mid-19th century.

Freud considered the relationship between birth asphyxia and infantile motor deficit of brain origin critically because of the fact that the development of children with birth asphyxia could be completely normal (Freud, 1893). Little, who was an orthopaedic physician, did not see such cases in his practice, or at least not frequently. But Freud with his analytical approach could not fail to notice these cases. He allowed the possibility that spasticity could be a result solely of intrauterine factors or combined with birth complications (Freud, 1968).

Freud’s analysis of birth asphyxia as a cause of CP elicited no lively discussion among his contemporaries, although it was noticeably different to Little’s views. As the usage of the term CP gradually increased, Little’s conclusion on the causal relationship between asphyxia (and other complications) during birth and spasticity was even generalized to all clinical types of CP (Scott, 1976).

Since the mid-20th century, when CP has also been studied epidemiologically, it has been shown again and again that relatively few cases can be explained on the basis of birth asphyxia (Scott, 1976; Paneth, 1986; Nelson and Leviton, 1991), although besides spastic diplegia, as spastic rigidity was termed at that time, CP also comprised other forms of non-progressive brain motor deficits (i.e. other spastic, ataxic and dyskinetic disorders) (Hagberg et al., 1975; Mutch et al., 1992).

The question, as to whether CP is, to a large extent, the result of birth complications, seemed thus practically solved. Then, studies appeared that demonstrated that birth asphyxia could not be regarded as a rare cause of CP among term infants (Hagberg et al., 2001; Moster et al., 2001), leading to the renaissance of a hypothesis thought obsolete.

**Cerebral palsy in the 21st century**

The efforts of the American Academy for Cerebral Palsy and the Little Club notwithstanding, the discussion on terminology and classification of CP continued (Bax, 1964; Mutch et al., 1992). In epidemiological studies, the Swedish classification of CP (Hagberg, 1989) became by far the commonest classification used. This has not changed yet, although recently the usage of the European classification has been slowly increasing (Surveillance of Cerebral Palsy in Europe, 2000). This happened without there being evidence that the Swedish classification is the most appropriate, and without any particular efforts to establish a consensus. In defining CP, pragmatism has not yet prevailed. Several different definitions are still used, although the compatibility of epidemiological studies is strongly dependent on the uniformity of the methodology used.

If several definitions of CP are read one after another, significant differences between them are perhaps not noticed (Table 1). If a study of CP is planned, however, the definition (no matter which has been chosen) has to be defined precisely, if a study is to be firmly based. It is not possible to avoid the ambivalence of the issue of brain maturation (at what age the brain ceases to be immature). In the definitions of CP, formulations such as: ‘in the period of early brain growth’ or ‘in the early stages of its (i.e. brain) development’ can still be found. It is also not possible to avoid the question as to whether aetologically and/or pathologically well-determined motor deficit beginning early in life although not being hereditary, as for instance kernicterus because of Rh incompatibility, or schizencephaly, are justifiably termed CP.

The upper age limit of the onset of motor deficit being recognized as CP is (exactly) defined in only a few definitions of CP (Wilson, 1916; Vining et al., 1976). None of these has been used widely, although chronological specification of the early stages of development (the immature brain) would make the definition of CP clearer. It does not seem a logical decision, but per se it was wise, for, instead of defining an authoritative agreement on what exactly CP is, it enabled the gradual evolution of the concept, which more easily lent itself to the inclusion of new discoveries about the human
Infantile cerebral palsy is a paralysis of cerebral origin occurring in the first six years of life. It is always a hemiplegia, and the cases which affect both sides of the body will be found to be no exception to this rule, but are simultaneous lesions upon the hemispheres. (Wilson, 1916)

Cerebral palsy may be defined as a condition characterized by paralysis, paresis, incoordination, dyskinesia, or any aberration of motor function that is due to involvement of the motor control centres of the brain. (Perlstein, 1952)

Cerebral palsy is a descriptive term applied to a group of motor disorders of young children, in whom full function of one or more limbs is prevented by paresis, involuntary movement, or incoordination. (Balf and Ingram, 1955)

Cerebral palsy is a persistent but not unchanging disorder of movement and posture, appearing in the early years of life and due to a non-progressive disorder of the brain, the result of interference during its development. (The Little Club, 1958 (Bax, 1964))

The term cerebral palsy does not designate a disease in any usual medical sense. It is, however, a useful administrative term which covers individuals who are handicapped by motor disorders which are due to nonprogressive abnormalities of the brain. (Crothers and Paine, 1988)

The term cerebral palsy ‘may be defined as one component of a group of childhood neurologic disorders which reflect cerebral dysfunction rather than damage per se and which may result from cerebral maldevelopment, infection, injury, or anoxia before or during birth or in the early years of life.’ (Denhoff and Robinault, 1960)

Cerebral palsy is ‘a disorder of movement and posture due to a defect or lesion of the immature brain.’ (Bax, 1964)

Cerebral palsy is a group of disorders characterised by reduced ability to make voluntary use of the muscles, caused by a non-progressive and non-hereditary brain disorder arising before or at delivery or during the first years of life.’ (Christensen and Melchior, 1967)

Cerebral palsy is the result of a lesion or maldevelopment of the brain, non-progressive in character and existing from earliest childhood. The motor deficit finds expression in abnormal patterns of posture and movement, in association with an abnormal postural tone.’ (Bobath, 1969)

Cerebral palsy is defined as a nonprogressive disorder of motion and posture due to brain insult or injury occurring in the period of early brain growth (generally under 3 years of age). (The Kennedy Institute (Vining et al., 1976))

Cerebral palsy is a descriptive term for a collection of nonprogressive neuromotor disorders of central origin that become manifest early in life and are not the result of a recognized cerebral malformation.’ (Paneth, 1986)

Cerebral palsy is ‘an umbrella term covering a group of non-progressive, but often changing, motor impairment syndromes secondary to lesions or anomalies of the brain arising in the early stages of its development.’ (Mutch et al., 1992)

How to redefine cerebral palsy?

To delineate CP firmly and clearly, a consensus is required. The history of the term CP (certainly not short) shows that there has not been a complete or long-lasting consensus about details of CP as yet. We believe that it will always be difficult to achieve, for (unchangeable) biological dimensions of CP are less significant than (changeable) nosographic, therapeutic or social ditto.
In neurology, there has been a tendency in the last decades to delineate ambiguously defined disorders by diagnostic criteria. Such an approach works well in both clinical practice and scientific studies. We propose that agreement about the diagnostic criteria for CP (an example of them – incomplete as is incomplete our knowledge of CP – is presented in Table 2) would prove fruitful.

Conclusion

The concept of CP arose as a temporary solution in an era, which is separated from the present by amazing progress in neural science. CP has, nevertheless, become an indispensable part of the nosographic system. Perhaps the umbrella term CP has continued to be used in spite of new discoveries of the human nervous system function because, as it is not firmly defined, it did not obstruct scientific progress; at the same time, however, it can fill the appointed nosographic emptiness. Whatever the explanation of this phenomenon might be, CP remains a handy term for scientific description and medical diagnosis, although it is still easier to explain what CP is not than to define it precisely.

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