Eminent venereologists 5: Carl Credé

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Carl Siegmund Franz Credé (fig 1) was born in Berlin in 1819 where his father, who was a French immigrant, held a senior appointment in the Ministry of Health and Education. After attending the Friedrich-Wilhelm Gymnasium, Credé studied medicine at the University of Berlin. He spent a semester at Heidelberg, where he met the famous obstetrician Franz Naegele, and graduated in 1842, with a thesis on umbilical hernia.¹ The next five years were spent in postgraduate study in Paris, Belgium, Vienna and Italy, until in 1847 he returned to Berlin and was appointed assistant in obstetrics to Professor von Busch, remaining in this post until 1852. In 1850 he became privat docent (a recognised teacher) in obstetrics. During his last year working with Busch he married Caecile von Cebrow and, unusually for the time, was allowed to live outside the hospital.² In 1852 he was appointed Director of the Berlin School of Midwives and Physician in Chief to the lying-in division of the Charité Hospital. Here he established a department of gynaecology, one of the first of its kind in Europe.³ In 1856 he was appointed Professor of Obstetrics and Director of the Lying-in Hospital in Leipzig, in Saxony, where he remained for the rest of his working life, becoming in time the "Nestor of German midwifery".²

While in Berlin, Credé made his first major contribution to obstetrics. In the early 19th century it was customary to expedite delivery of the placenta by a combination of intravaginal manipulation and traction on the umbilical cord, procedures which carried the possibility of major complications, including haemorrhage, inversion of the uterus and post-partum sepsis.⁴ Credé believed that these hazards could be avoided by abdominal expression of the placenta: *"In order not to prolong anxiety for the parturient, and to allow the physician to return to his other responsibilities, it is justifiable to hasten the slow course of nature . . . One single energetic contraction of the uterus quickly ends the whole process. I have succeeded in innumerable cases, no matter how sluggish the labour, in producing a strong contraction by first a gentle then a strong massage of the uterus through the abdominal wall. I envelop the entire uterus in my hand, exerting a gentle pressure. Under my grasp I can feel the placenta glide out of the uterus . . . The uterus remains contracted, with little danger of haemorrhage."*⁵

Although it is often called "Credé's method"

Fig 1 Carl Credé.

(Credé'sche Verfahren), Credé himself never claimed priority for this procedure, citing the Austrian physician von Plenck as its originator. It remained in use for many years, although it is now considered to carry a risk of shock and to be justified only in emergencies such as haemorrhage; Credé inclined to this view himself in later life.

In Leipzig, Credé's talents as a clinician, teacher and administrator enabled him to create a thriving and prestigious department. His personal reputation grew, and in 1860 he received the honorary post of Aulic counsellor. He devoted himself mainly to obstetrics, maintaining like many obstetricians before and since, that improvements in this field would lead to fewer gynaecological problems. With his son-in-law Gerhard Leopold and others, he started a crusade against the excessive internal examinations practised by doctors and midwives of the day on women in labour, which they thought led to infection. He wrote several textbooks and monographs on obstetric subjects. His *Lehrbuch der*

Fig 2 *Gonococcal ophthalmia neonatorum*.

Hebammenkunst, a book for midwives which he wrote with Leopold, went into five editions. He was co-editor of the *Monatsschrift für Geburtskunde*, and when this became *Archiv für Gynäkologie* he remained its editor for 39 years.

Credé's assured place in the history of venereology comes from his work on the prophylaxis of ophthalmia neonatorum, which he began in the early 1870s. This was a common and serious disease (fig 2). Its incidence varied with social status, but in European maternity hospitals it occurred in up to 12% of live births; corneal damage of some degree developed in 20% of babies with ophthalmia, and complete blindness in 3%.⁶ It had been suggested in the 18th century that the disease was connected with maternal purulent vaginal discharge, although the effect was thought to be produced through the blood stream.⁷ Later, although some people continued to believe that ophthalmia was caused by cold, dust or bright light, it was realised that the real cause, at least of the worst cases, was maternal gonorrhoea.^{8,9} It is quite possible that Credé was familiar with Noeggerath's work, which was published in Germany in 1872,¹⁰ in which he maintained that the majority of women who married men with a history of gonorrhoea became infected, and that this infection persisted indefinitely in a "latent" form, a hypothesis which is obviously relevant to the natural history of ophthalmia neonatorum. It is said that when Credé began his studies 35% of pregnant women in public hospitals were infected with gonorrhoea.¹¹

If ophthalmia was due to a contagion from the mother transmitted during deliver, prevention might be possible. As early as 1807 Gibson⁸ had made the following percipient suggestions: "First, to remove if possible the disease in the mother during pregnancy; second, if that cannot be accomplished, to remove artificially as much discharge as possible from the vagina at the time of delivery; and third, to pay, at all events, particular attention to the eyes of the child by washing them immediately after delivery with a liquid

calculated to remove the offending matter or to prevent its noxious action."

Some practitioners reported good results with these simple measures. Others had irrigated the mother's vagina with water, chlorine water or carbolic acid if any discharge was present, and at different times solutions of carbolic acid, thymol, salicylic acid, potassium permanganate and silver nitrate had been applied to the infant's eyes after delivery.¹² But there was no unanimity on the preventive treatment of ophthalmia; Credé's achievement was not only to devise the most practical method, but to demonstrate its effectiveness in a large series of deliveries. He published only three papers on the subject, but these were to change obstetric practice for the next century.

He started with the assumption that ophthalmia neonatorum was usually acquired from gonorrhoeal infection of the mother during the baby's passage through the birth canal. In his first paper¹³ he describes how thorough cleaning of the vagina of women in labour gave poor results. Vaginal douching was next combined with the application of 1.7% borax solution to the baby's eyes; ophthalmia became less frequent, but did not cease. Finally, from December 1879, all eyes were treated with a single drop of 2% silver nitrate solution applied with a glass rod, and the vaginal douches were abandoned. The babies treated in this way remained free from ophthalmia, despite clinical evidence of gonorrhoea in many of the mothers. Mild ocular hyperaemia and increased lacrimation might be present for the first 24 hours, but no major side effects were reported. Credé summarised his results since 1874 in a well-known table (table). In his second paper¹⁴ he reports on a further 300 babies treated with a simplified regimen. The cord was cut and the baby washed, then the eyes were wiped clean with cotton wool and plain water and 2% silver nitrate solution instilled. None of these 300 babies developed ophthalmia. In his final paper¹⁵ Credé summarises his results with the silver nitrate procedure. In the three years since 1880 there had been 1160 live births from women under his care, with only two cases of ophthalmia.

Credé summarised his work in a book¹⁶—an

Table Incidence of ophthalmia neonatorum in University Maternity Hospital Leipzig 1874–1880

Year	Births	Ophthalmia	Percent
1874	323	45	13.6
1875	287	37	12.9
1876	367	29	9.1
1877	360	30	8.3
1878	353	35	9.8
1879	389	36	9.2
1880 (to 31 May)	187	14	7.6
1880 (1 June to 8 December)	199	0	0

After Credé 1881.¹³

English translation of a short extract is available¹¹—but really nothing more needed to be said. The success of his method was soon confirmed by others,¹⁷ and gonococcal ophthalmia virtually vanished from hospitals where it was used. The strength of the silver nitrate solution was later reduced, but in other respects Credé's plan remained unchanged; it became part of obstetric practice in most parts of the world, and remained so for many years. Neisser discovered the gonococcus in 1879,¹⁸ and it was subsequently shown that *Neisseria gonorrhoeae* was present in two thirds of the cases of ophthalmia neonatorum brought to hospital.¹⁹ The aetiology of non-gonococcal ophthalmia was uncertain at the time, but it was acknowledged to be milder and without the blinding potential of the gonococcal form.

Poor health forced Credé to retire in 1887, and there was a sad occasion when he and his wife visited the Department of Obstetrics for the last time and said farewell to the staff. He developed carcinoma of the prostate, and ironically towards the end of his life he lost his vision because of uraemia. After a prolonged and distressing illness he died in 1892 at the age of 73 years.

Credé was a distinguished and respected figure in 19th century obstetrics, and his Department was well-known throughout Europe. He was one of the ablest academic and practical teachers in Germany and took a great interest in his junior staff, many of whom went on to distinguished careers. Like many obstetricians, he was inherently conservative, and unenthusiastic about the technical and mechanical devices which proliferated in his day; he taught that in obstetrics the more a woman is handled the greater the risk of infection, citing the Hippocratic principle *nil nocere*. Personally he was modest, and apparently had no desire for further advancement; according to Leopold² he is known to have refused chairs in other universities, including Berlin, saying that such positions should be given to younger people. Credé had eight children; unusually for the period, all survived and his family was a constant source of joy to him. His house was always open to guests, including medical students, and those who saw him with these young people report that he was gay and full of humour. Although he enjoyed literature and painting, his life had been dedicated to medical science, and this occupied the forefront of his thoughts until his dying day.

With his usual diffidence Credé used to say that he was "only an obstetrician", but his eminence in this field meant that the results of his studies on the prevention of ophthalmia neonatorum received proper attention from his colleagues. In this respect he was luckier than Semmelweis, whose ideas on the prophylaxis of puerperal fever, although correct, were greeted with scepticism and hostility by the

medical establishment of the day and whose career suffered in consequence. Like Bell, Ricord, Noeggerath and other pioneers who made important discoveries about gonorrhoeae Credé, while recognising an infective principle, did not know its exact cause; Neisser's discovery of the gonococcus was reported as he finished his work on silver nitrate prophylaxis.

Although sometimes criticised for toxicity, Credé's method remained in general use for many decades. Owing to the low prevalence of maternal gonorrhoea, ocular prophylaxis has now been abandoned in some countries, for example Britain and the Netherlands. In others, alternative topical agents such as tetracycline ointment are used, tetracycline being as effective as silver nitrate but less irritating.²⁰ In recent years *Chlamydia trachomatis* has been recognised as an important cause of ophthalmia neonatorum; although they both have some effect, neither silver nitrate nor tetracycline applied at birth give effective prophylaxis; emphasis has now moved towards the antenatal detection and treatment of maternal chlamydial infection. Nevertheless, it is gonococcal ophthalmia neonatorum which still presents the most serious threat to the eyesight of children. Its prevention is of the utmost importance, and Credé showed the world that this was possible.

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