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The History of Local Anaesthesia

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Competing interests

• Elected Council Member, Royal College of Anaesthetists (RCoA)
• Past President, Association of Anaesthetists of Great Britain & Ireland (AAGBI)
• Member
  • Regional Anaesthesia UK
  • European Society of Regional Anaesthesia
  • American Society of Regional Anesthesia
  • Irish Society of Regional Anaesthesia
Important dates

• 16th October 1846

• 11th September 1884

• 10th May 1958

• 23rd November 1963

• 21st July 1969
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16th October 1846
World Anaesthesia Day

I love #anaesthesia because

#RCoAWorldAnaesthesiaDay
16th October 1846

W T G Morton

John Collins Warren

Edward Gilbert Abbott
16th October 1846

“Gentlemen – this is no humbug!”
30th September 1846

- WT G Morton
- Grenville G Hayden
- Ebenezer Hopkins Frost
30th September 1846

Lunatic with a naked flame

WT G Morton

Ebenezer Hopkins Frost
20\textsuperscript{th} January 1845

- Horace Wells
- Nitrous oxide
- Dental extraction
- Did not go well
- “Humbug moment”
20th January 1845

- Discredited by incident
- Became a travelling canary salesman
- And addicted to chloroform
- Committed suicide after being incarcerated for throwing sulphuric acid at two prostitutes
10<sup>th</sup> December 1844

- Gardner Quincy Colton
- Showman and former medical student
- Nitrous oxide performances
- Horace Wells in the audience
30th March 1842

- Crawford W Long
- Leg amputation
- Ether anaesthesia
Ether was far from being a new drug...
Raymond Lully (1232 – 1315)

- Licentious, Spanish *bon vivant* who later became a monk
“My light is the Lord himself”
Raymond Lully (1232 – 1315)

- Licentious, Spanish bon viveur who later became a monk
- Invented ether (Sweet Oil of Vitriol) by adding sulphuric acid to wine (1275)
- Did not spot its anaesthetic effects
Valerius Cordus (1515 – 1544)

- German physician and botanist
- Rediscovered the sulphuric acid and wine trick
- Did not spot ether’s anaesthetic properties
Paracelsus (1493 – 1541)

- Philippus Aureolus Theophrastus Bombastus von Hohenheim
- German polymath and founder of toxicology
- “Ether has associated with it such a sweetness that it is taken even by chickens…
- …and they fall asleep from it for a while but awaken later without harm”
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Imperial College Healthcare NHS Trust, London
Coca

- An ancient practice
- Increased energy
- Decreased appetite
- Numb lips?
“Folk neurosurgeons chewed cocaine while performing the procedure... allowing their saliva to dribble into the wound to produce anaesthesia”
Francisco Pizarro (1475 – 1541)

- Conquest of the Inca Empire
- Native use noted
- Euphoric and energising effects
- But not painkilling effects
Father Bernabe Cobo (1475 – 1541)

“And this happened to me once, that I repaired to a barber to have a tooth pulled, that had worked loose and ached, and the barber told me how he would be sorry to pull it because it was sound and healthy”
Father Bernabe Cobo (1475 – 1541)

“A monk friend of mine who happened to be there and overhearing, advised me to chew for a few days on coca. As I did, indeed, soon to find my toothache gone”
After this… nothing happened

- For some considerable time
- Europeans well aware of its use and abuse
- And even that it made your lips go numb
- But the “Mental Leap” was lacking
- Next stage in the story was some 350 years later
SMS Novara
Circumnavigation 1857 - 1859
Archduke Maximilian von Württemberg
Kommodore Bernhard von Wullerstorff-Urbair
The Austrian Navy’s most famous officer

- Georg Ritter von Trapp
- Obsessed with submarines
- First wife: Agathe Whitehead
- Second wife: Maria, a novice nun
Nothing whatsoever to do with the History of Local Anaesthesia
Back to the SMS Novara
Carl Scherzer (1821 – 1903)
Friedrich Wohler (1800 – 1882)
Friedrich Wohler (1880 – 1882)

• Professor of Chemistry, University of Göttingen
• Urea and calcium carbide
• Aluminium, silicon, yttrium, beryllium and titanium!
• Asked Scherzer to pick up some coca leaves in South America
• Coca leaves given to Albert Niemann
ALBERT NEIMANN (1840-1921)

- Albert Friedrich Emil Niemann (May 20, 1834 – January 19, 1861) was a German chemist.
- In 1859, he isolated cocaine, and he published his finding in 1860.
- He published his finding in 1860 in his dissertation titled "Über eine neue organische Base in den Cocablättern (On a New Organic Base in the Coca Leaves). This dissertation earned him his Ph.D. and was published in 1860 in the journal Archiv der Pharmazie."
Albert Niemann (1831 – 1917)
Albert Niemann (1834 – 1861)

- Isolated the active principle
- Called it cocaine
- Published findings in 1860
- Even reported that it made his lips go numb
- Did not have a Eureka Moment
- Died shortly thereafter

Goslar, Germany
Wilhelm Lossen (1838 – 1906)

- Continued Niemann’s work
- Determined the formula of cocaine
- $C_{17}H_{21}NO_4$
- Even reported it made his lips go numb
- Did not have a Eureka Moment
Richard Willstätter (1872 – 1942)
Paolo Mantegazza (1832 – 1910)
Paolo Mantegazza (1832 – 1910)

- Italian chemist
- Devised his own purification process
- Tested cocaine on animals
- And himself
- Particularly on himself
“I sneered at the poor mortals condemned to live in this valley of tears while I, carried on the wings of two leaves of coca, went flying through the spaces of 77,438 words, each more splendid than the one before...”
“An hour later, I was sufficiently calm to write these words in a steady hand: God is unjust because he made man incapable of sustaining the effect of coca all life long...”
“I would rather have a life span of ten years with coca...

...than one of 10,000,000,000,000,000,000,000 centuries without coca”
Angelo Mariani (1838 – 1914)
Angelo Mariani (1838 – 1914)

- Corsican chemist
- Shrewd businessman
- Grew coca in his greenhouse
- Macerated the leaves with wine
- To produce a “delicious and invigorating beverage”
- Vin Mariani (1863)
DOSE

One Claret-glassful before or after the principal meals, and for Children half the quantity.
Premières rencontres avec une bouteille de vin Mariani!
• Henri Rochefort
• Journalist, playwright and politician
• “Vin Mariani completely reformed my constitution...”
• “...you should offer some to the French Government”
Pope Leo XIII (1810 – 1903)
His Holiness Pope Leo XIII Awards Gold Medal
In Recognition of Benefits Received from

Vin Mariani
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John Pemberton (1831 – 1888)

- US Civil War veteran, pharmacist and morphine addict
- “French Wine of Coca”
- Local prohibition banned alcohol
- Flavoured with cola nuts
- Coca Cola (1886)
Wiener Allgemeines Krankenhaus (1884)
Two young doctors
Sigmund Freud (1856 – 1939)

• Studying morphine addiction
• Trying to find something to help wean patients off morphine
• Was trying cocaine
Sigmund Freud (1856 – 1939)

- Wrote a review in 1884 called “Uber Coca”
- Noted anaesthetic effects on lips
- About to do some more experiments with Koller...
Martha Bernays (later Martha Freud)
Carl Koller (1857 – 1944)

• Young Czech ophthalmologist
• Obsessed with placing substances in animals’ eye to see if they would make them insensible
• Had tried chloral hydrate, bromide and morphine
• But none had worked
While Freud was away...

“A colleague, Dr Engel, placed some cocaine in his mouth from the point of his penknife”

“My, how that numbs the lips” Engel remarked”
While Freud was away...

Koller replied: “Yes, that has been noticed by everyone who has eaten it.”

“And then he realised in a flash that he was carrying in his pocket the local anaesthetic for which everyone had been searching”
While Freud was away...

Eureka!
While Freud was away...

- Tried it on a nearby frog
- On a rabbit
- On a dog
- And then on himself
11th September 1884

• The first operation under local anaesthesia
• German Ophthalmological Society Congress in Heidelberg on 15th September 1884
• Sent a colleague to read his paper
Josef Brettauuer (1835 – 1905)

• Became one of Italy’s best known ophthalmologists and numismatists

Thanks to Dr M Geurig for the image
Josef Brettauer (1835 – 1905)
17th October 1884

Medical Society of Vienna
Carl Koller

• Forced to leave Vienna in 1885
• Insulted by a colleague
• Challenged him to a duel with heavy sabres
• Which Koller won
• Failed to get appointed to a post as a Consultant Ophthalmologist
• And moved to the USA
Local anaesthesia

- Usage spread like wildfire
- Free from current ethical constraints on human experimentation
- Within months cocaine was in use throughout the world
- Four main uses
  - Local anaesthesia
  - Nerve blocks
  - Spinal anaesthesia
  - Epidural anaesthesia
William Stuart Halsted (1852 – 1922)
William Stuart Halsted (1852 – 1922)
PRACTICAL COMMENTS ON THE USE AND ABUSE OF COCAINE;
SUGGESTED BY ITS INVARIABLY SUCCESSFUL EMPLOYMENT IN MORE THAN A THOUSAND MINOR SURGICAL OPERATIONS.

By WILLIAM S. HALSTED, M.D.

NEITHER indifferent as to which of how many possibilities may best explain, nor yet a loss to comprehend, why surgeons have, and that so many, quite without discredit, could have exhibited scarcely any interest in what, as a local anaesthetic, had been supposed, if not declared, by most so very sure to prove, especially to them, attractive, still I do not think that this circumstance, or some sense of obligation to rescue fragmentary reputation for surgeons rather than the belief that an opportunity existed for assisting others to an appreciable extent, induced me, several months ago, to write on the subject in hand the greater part of a somewhat comprehensive paper, which poor health disinclined me to complete.
William Stuart Halsted (1852 – 1922)

- In 1886, he attempted to wean himself off cocaine with...
- Morphine
- He became doubly addicted
- Chief Surgeon at Johns Hopkins Hospital in 1889
- Professor Surgery in 1892
William Stuart Halsted (1852 – 1922)

- “Moody, elusive, sarcastic and prone to leaving operations halfway through”
- Ate coddled guinea hen eggs for breakfast
- Passionate dahlia grower
- Had all his laundry sent to Paris
James Leonard Corning (1855 – 1923)

- New York neurologist
- 1885: armed with a pioneering spirit and a syringe of cocaine
- Performed a spinal injection on one dog
- Before attempting it on a patient
- Suffering from “spinal weakness and seminal incontinence”
James Leonard Corning (1855 – 1923)

- Injected him with a large amount of cocaine
- Did not achieve a spinal injection – probably epidural
- Assessed sensation with a wire brush
- “After 20 minutes, application of the brush to the penis and scrotum caused neither pain nor reflex contraction”
Karl August Gustav Bier (1861 – 1949)
Heinrich Quincke (1842 – 1922)

- Introduced lumbar puncture for diagnosis and treatment
- “Spinal tap”
- Bier put two and two together
Bier and Hildebrandt – 24th August 1898

Thanks to Dr M Geurig for the image
Bier and Hildebrandt – 24th August 1898

- Hildebrandt attempted to give Bier a spinal anaesthetic
- The large needle was painful...
- And did not fit well with the syringe
- CSF leakage
- Some cocaine injected
- No anaesthesia
- Significant headache
Bier and Hildebrandt – 24\textsuperscript{th} August 1898

• Bier’s turn

• After 5 minutes, it was time to test:
  • Pinching with fingernails
  • Blows with a hammer
  • A burning cigar on the leg
  • Avulsing a pubic hair
  • A firm squeeze of the testicles

• Celebration with wine and cigars

• And thumping headaches
Spinal anaesthesia
Fidel Pages (1886 – 1923)
Anestesia Metamerica (1921)
Gaston Labat (1876 – 1934)

• Born in the Seychelles
• Worked with Victor Pauchet in France
• Co-author of *L’Anesthésie Régionale* (1921)
• Moved to the USA in 1920
• Published *Regional Anesthesia* in 1922
Regional Anesthesia
Its Technic and Clinical Application

By
Gaston Labat, M. D.
Lecturer on Regional Anesthesia at The New York University; Lecturer of the Faculty of Sciences, University of Montpellier; Lecturer of the Faculty of Medicine, University of Paris; Formerly Special Lecturer on Regional Anesthesia, The Mayo Foundation, University of Minnesota

With a Foreword by
William J. Mayo, M. D.

With 315 Original Illustrations

Philadelphia and London
W. B. Saunders Company
1922
Gaston Labat (1876 – 1934)

- Founding father of the American Society of Regional Anaesthesia (1923)
- His colleagues wished to call it the “Labat Society”
Local Anaesthesia in 1923

- Local anaesthesia well established
- Comprehensive set of nerve blocks
- Spinal anaesthesia
- Epidural anaesthesia
- A society for local anaesthesia
- All within 40 years of the date of the first local anaesthetic
- 18th September 1884
- Or was it...
Vassily von Anrep (1852 – 1927)

• Russian physician and politician
• Published a paper in 1880 suggesting medical uses for cocaine
• Probably used it as a local anaesthetic before Koller in 1884
• But not for surgery
• And he didn’t publicise it
• Until after Koller had done so
ВРАЧ

ССХИ КОФИИА... КАК СРЕДСТВО МЫСТНО АЭСТЕЗИРУЮЩЕЕ.

В. К. А БЕР.

Сильно мозг, впервые учитывая на мышь анестезирующее свойство кофии. В своей работе неврологических свойств кофии, написанной еще в 1928 г., я наблюдала у людей в терапевтическом применении кофии, а также на первых этапах мышц мышечной системы. В 1929 г., когда я писала о том, что эффект кофии может быть получен у людей, я видела, что кофии, применяя кофии, мышцы резко сокращаются.

В. К. А БЕР.

Впервые выяснилось, что кофии является анестезирующим средством. У кофии может быть получен эффект, но при этом важно учитывать, что кофии может быть применен у людей, которые имеют повышенную чувствительность к кофии.

В. К. А БЕР.
Celebrations in 2017

• General anaesthesia: 171st Anniversary (sort of)
• Local anaesthesia: 133rd Anniversary (sort of)
Conclusions

• That history more often rewards the person who appears to do something for the first time and tells everyone else about it than the person who actually does it for the first time but does not publicise it

• That Local Anaesthesia and General Anaesthesia were more discoveries than inventions
Conclusions

• That on 16th October every year we celebrate the first successful public demonstration of general anaesthesia with ether

• That on 11th September every year we SHOULD celebrate the first local anaesthetic given for the performance of a surgical procedure
The End

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