

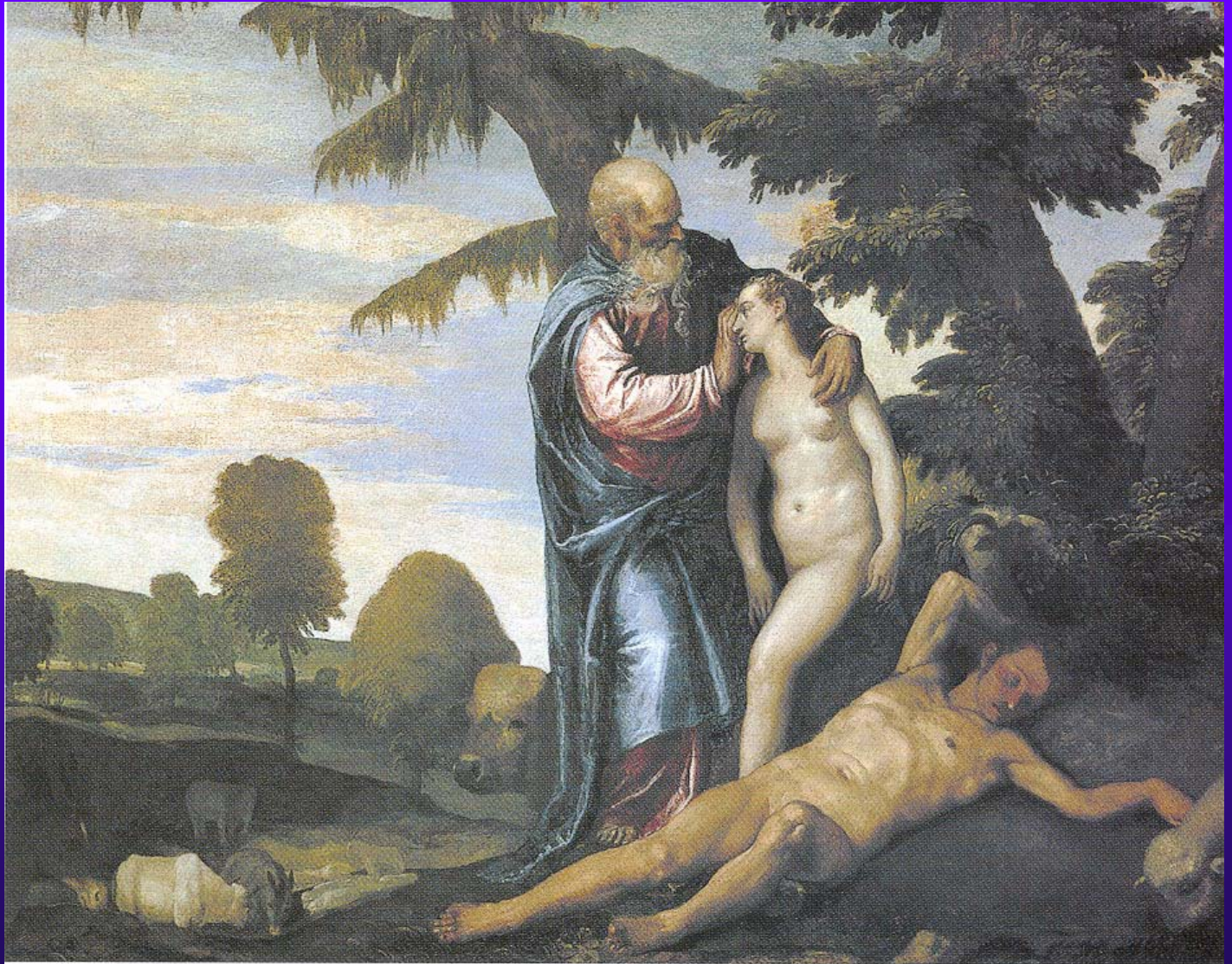


Anesthesiology, Yesterday, Today and Tomorrow

Adolph H. Giesecke MD.

Retired Jenkins Professor and Former
Chairman, Anesthesiology and Pain
Management, UTX Southwestern
Medical Center, Dallas TX.

The First Anesthesiologist. ¹



CALIARI - CREATION OF EVE - 1570



◆ "And the Lord God caused a deep sleep to fall upon Adam, and he slept." Genesis 2:21 .

Managing Pain Before Anesthesia

- ◆ Local application of cold water, ice or pressure.
- ◆ Plants and extracts.
 - ◆ Coca leaves chewed and saliva dripped into injured areas or open wounds - Inca Shamans.
 - ◆ Alcohol or/with opium or hemp – “soporific sponge.”
- ◆ Hypnosis



Opium



- ◆ Most common,
- ◆ Opium poppy, *Papaver somniferum*,
- ◆ Mandragora or mandrake from *Atropa mandragora*,
- ◆ belladonna from the Morning Glory,
- ◆ marijuana or *Cannabis indica*.



In those “dark” days many patients approached surgery as though facing execution, an often appropriate assessment of uncontained risks, including pain, hemorrhage, shock and postoperative infection.



**The easiest pain
to bear is
someone else's.**

Seishu Hanaoka, 1760-1835. ²

- ◆ “Angel of Medicine.”
- ◆ Duty to relieve pain.
- ◆ “Tsusensan” 1805.
- ◆ Mother and wife volunteered.
- ◆ Breast cancer removed with tsusensan 10/13/1805.



FIG. 1. Seishu Hanaoka. (All photographs reprinted with permission from Keizo Mori: Seishu Hanaoka.¹⁰)

Hanaoka 1805

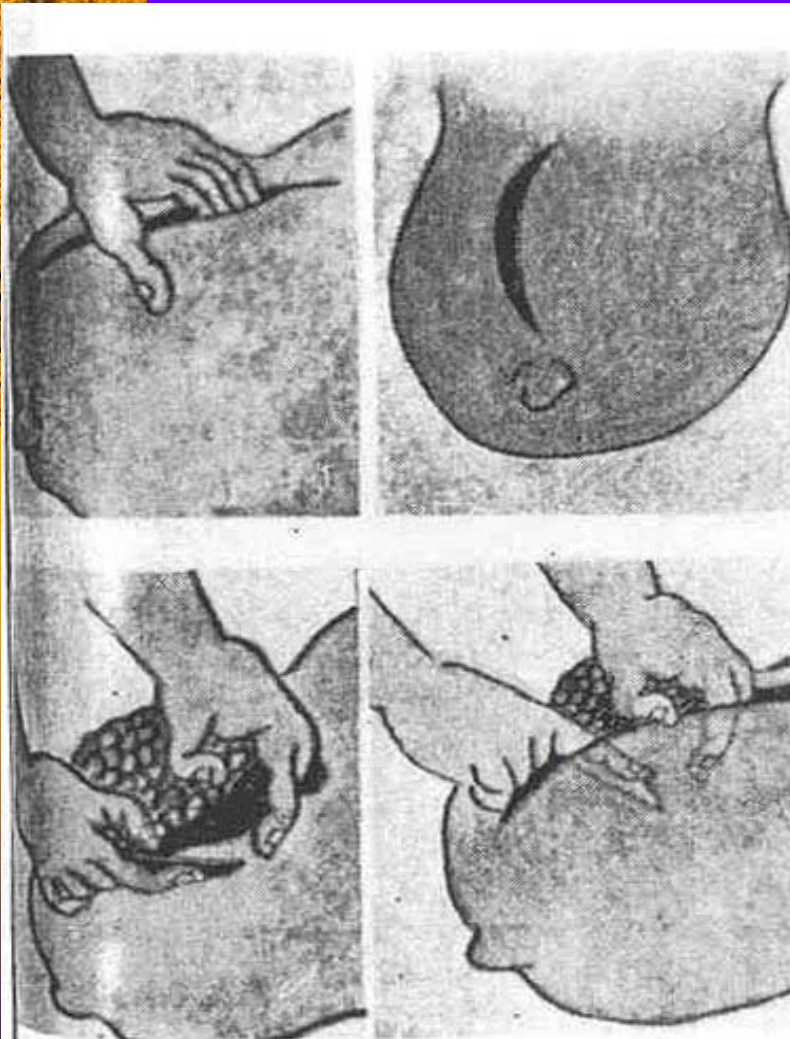


FIG. 3. Hanaoka's method of excision of breast cancer.



Golden Epochs of Anesthesiology



- I. Inhalation anesthesia, 1846.
- II. Regional anesthesia, 1884.
- III. Intravenous anesthesia, 1932.
- IV. Neuromuscular blockers, 1942.
- V. Precision anesthesia, 1986.

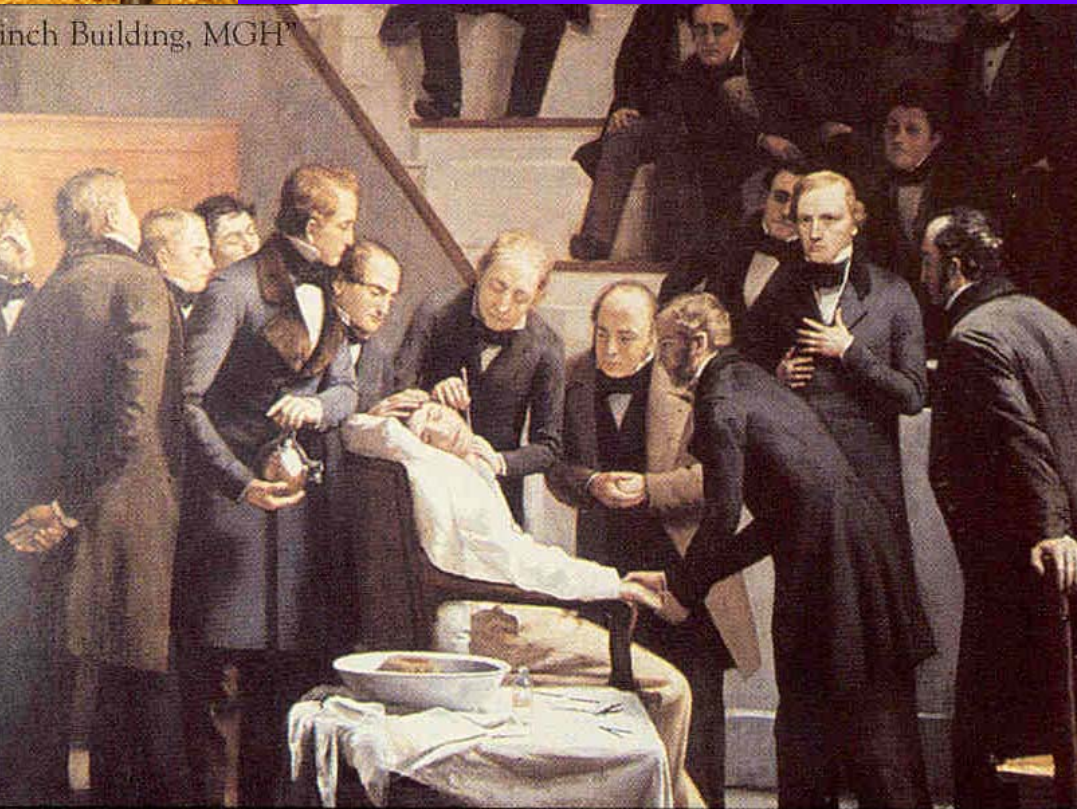
Golden Epochs of Anesthesiology



I. Epoch of inhalation anesthesia, 1846.

ETHER DAY. ³

inch Building, MGH

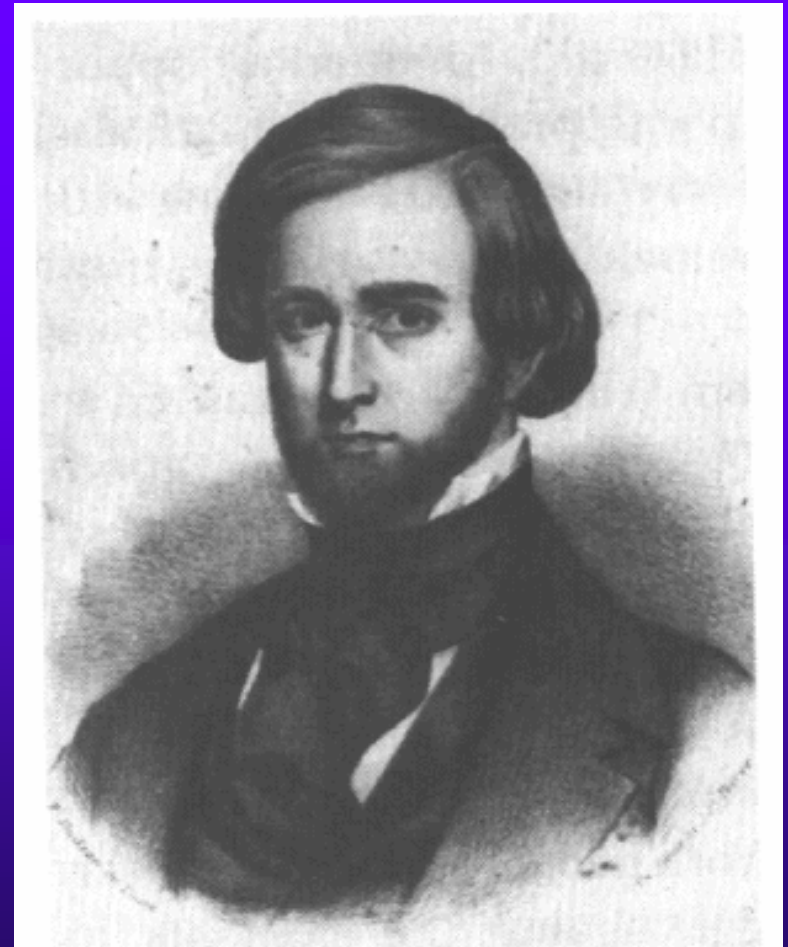


"First Operation W

- ◆ Successful public demonstration 10/16/1846 at MGH.
- ◆ Ether Dome, now a national shrine.

William Thomas Morton 1819-68.³

- ◆ Clothing merchant, swindler, dentist, medical student.
- ◆ Attended Wells' demonstration of N₂O in 1845.
- ◆ Idea of more potent agent, ether from Jackson.
- ◆ Patented "Letheon."





Ether

- ◆ **“Sweet vitriol” discovered 1275 by Spanish chemist Raymundus Lullius.**
- ◆ **1540, synthesis of ether described by German scientist, Valerius Cordus.**
- ◆ **Swiss physician and alchemist Paracelsus discovered the hypnotic effects of ether.**



Crawford Williamson Long (1815-1878).⁴



**First to use ether for surgery.
“Discoverer of anesthesia?”**

**03/30/1842 painless removal of
neck tumor after dropping ether
on a cloth (anesthesia fee 0.25).**

**Discovery unpublished, predates
Morton’s public demonstration
by 4 years.**



The anniversary of Long's great accomplishment, March 30th, is celebrated in the United States as "Doctor's Day", and all medical specialties are honored.

Sir Humphrey Davy (1778 -1829)



- ◆ Superintendent of Thomas Beddoes's Pneumatic Institute.
- ◆ Rx pulmonary tuberculosis by inhaling various gases, N_2O , H_2 , O_2 , and CO_2 .



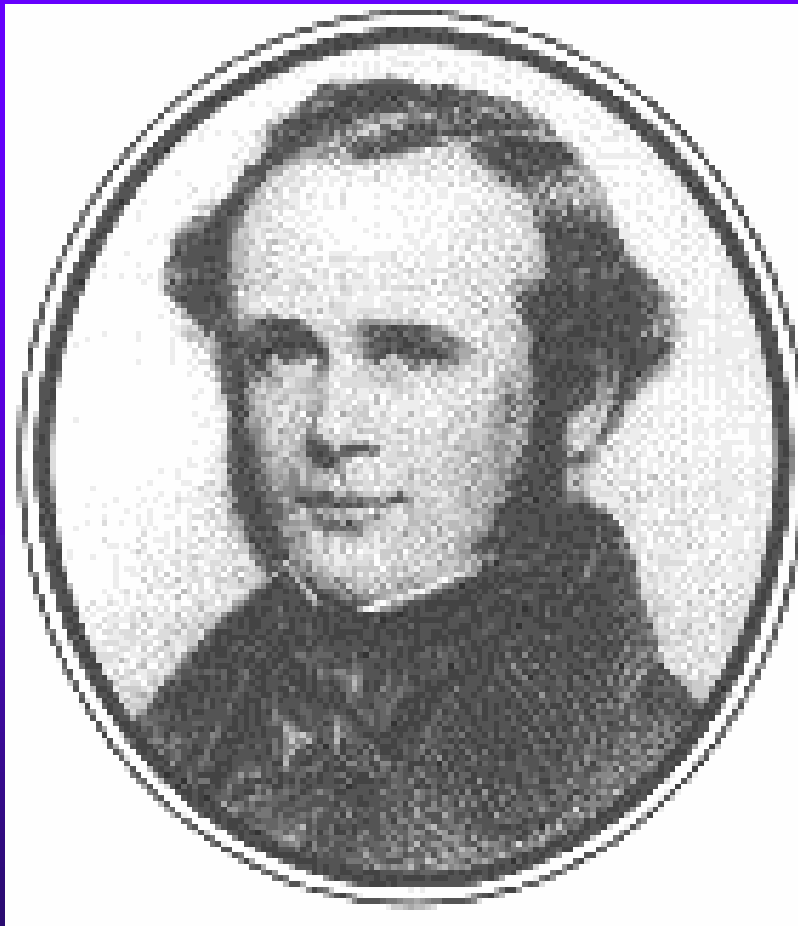
Humphrey Davy. ⁴

- ◆ *1800 Researches, Chemical and Philosophical: Chiefly Concerning Nitrous Oxide.*
- ◆ He described inhaling N₂O himself and obtaining relief from a painful condition.
- ◆ He suggested N₂O might be used for surgery, 44 years before Horace Wells.

**Drawing from the 18th century depicting
the recreational use of nitrous oxide
- laughing gas**



Horace Wells (1815 - 1848). ⁵



- Attended a demonstration of N₂O conducted by Quincy Colton, 12/10/1844.
- **Noticed that a man intoxicated by N₂O lacerated his leg, and felt no pain or recall.**





Horace Wells.

- **The next day, Wells asked Colton to administer N₂O, while an associate extracted a tooth.**

- ◆ **Demonstrated N₂O at Harvard 01/1845, patient cried, students hissed “Humbug.”**

- ◆ **Addicted to chloroform.**

- ◆ **Arrested for throwing acid on prostitutes, committed suicide in jail.**

- ◆ **Pushed a known toxin to unconsciousness.**



Inhalation landmarks

- ◆ John Snow (1813-58), preventive medicine, first full time anesthesiologist.
- ◆ James Simpson (1811-70), Chair of Midwifery Edinburgh, OB anesthesia 01/1847, chloroform 1847.
- ◆ Henry Boyle, first anesthesia machine 1917.
- ◆ Ralph Waters, CO₂ absorption 1924.
- ◆ Ivan Magill, endotracheal intubation 1920.

Golden Epochs of Anesthesiology



- ◆ II. Epoch of regional anesthesia, 1884.



Karl Koller 1857-1944

- ◆ Ophthalmologist in Vienna.
- ◆ Dissatisfied with GA for eye surgery. Restless and coughing during surgery, vomiting and pain postop.
- ◆ 1884 with Sigmund Freud introduced cocaine from Erythroxyton coca.



Landmarks in Regional Anesthesia

- ◆ William Halstead, nerve blocks of face and arm 1886, addicted to cocaine.
- ◆ August Bier, spinal anesthesia 1898.
- ◆ Virginia Apgar promotes regional analgesia in childbirth 1930.

Virginia Apgar 1909-1974. ⁶



- ◆ Devised a system for grading the newborn's condition, "Apgar Score."
- ◆ Promoted R.A. which relieved labor pain without interfering with the baby.
- ◆ Featured on US Postage stamp.

Golden Epochs of Anesthesiology



- ◆ III. Epoch of intravenous anesthesia, 1932.

John S. Lundy, 1894-1973

- ◆ 1903 Barbitone synthesis by Fischer, Berlin, Nobel Prize.
- ◆ 1932 Evipan used IV by Weese Schraff, & Rheinoff.
- ◆ 1934 Lundy, Mayo Clinic used Sodium Pentothal.

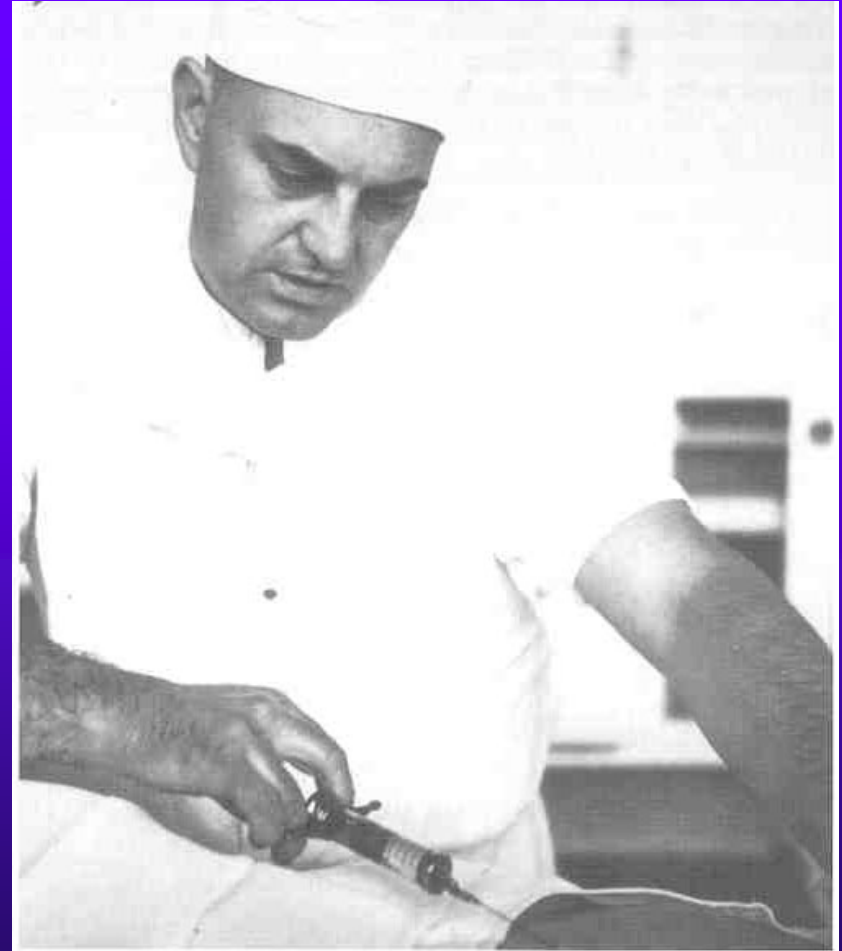


Fig. 1. Dr. Lundy was head of the section on anesthesia at the Mayo Clinic from 1924 to 1952 and a senior consultant

Golden Epochs of Anesthesiology



IV. Epoch of neuromuscular blockers, 1942.



Neuromuscular Blocking Drugs

- ◆ 1942 Curare first used clinically by Griffith and Enid Johnson in Montreal.

Paleopharmacology of curare



Paleopharmacology of curare





NMBAs

- ◆ 1812 Waterton brought “woorara” from Guiana to England, inoculated 3 donkeys, 2 died, one survived with tracheostomy and IPPV.
- ◆ 1857 Claude Bernard published that curare blocked the NMJ.
- ◆ 1940 Bennett used curare to modify seizures induced by metrazol.

Claude Bernard, 1857

Claude Bernard
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DU COLLÈGE DE FRANCE. Property of
LEÇONS
SUR LES EFFETS
DES SUBSTANCES TOXIQUES
ET MÉDICAMENTEUSES

PAR
M. Claude BERNARD,
MEMBRE DE L'INSTITUT DE FRANCE,
Professeur de médecine au Collège de France,
Professeur de physiologie à la Faculté des sciences, Membre des Sociétés de Biologie,
Philomatique de Paris, correspondant de l'Académie
de médecine de Turin, des sciences médicales et des sciences naturelles
de Lyon, de Suisse, de Vienne, etc., etc.

Avec 32 figures intercalées dans le texte.

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insensible dans les trois membres intacts, c'est-à-dire que lorsqu'on pince ses pattes, elle ne remue pas; mais il en résulte des mouvements dans la patte liée.

A deux heures et demie, on a les mêmes phénomènes; à deux heures quarante minutes, quand on pince la patte postérieure intacte, aucun mouvement ne se manifeste. Mais quand on pince les pattes antérieures, on a des mouvements dans la patte postérieure liée.

Au bout d'un certain temps de repos, lorsqu'on pince la patte postérieure intacte, on observe des mouvements dans la patte postérieure liée;— quand on remue la plaque de liège sur laquelle la grenouille est fixée, il survient des mou-

vements dans la patte liée. On observe alors une différence de teinte singulière dans la peau de la grenouille: la peau de la patte liée est d'une couleur plus claire que celle du reste du corps.

On laisse alors reposer la grenouille pendant un quart d'heure, et après ce temps, quand on vient à pincer successivement les trois pattes empoisonnées, on a toujours des mouvements dans la patte liée, non empoisonnée.

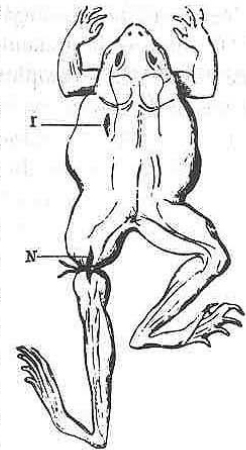


FIG. 22.

Golden Epochs of Anesthesiology



- ◆ V. Epoch of precision anesthesia, 1986.

Ellison Pierce MD, Pres. ASA 1984.

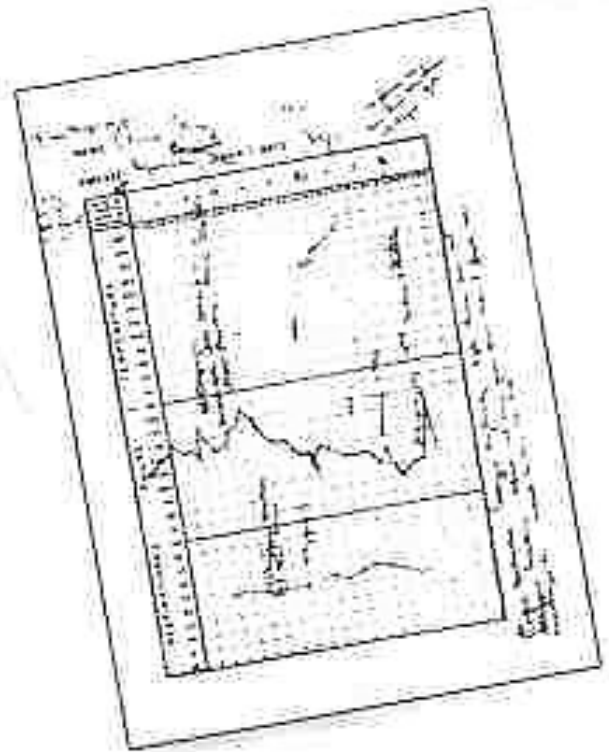


- ◆ ABC 20/20, “The Deep Sleep, 6000 will suffer brain damage” 4/22/1982.
- ◆ Standards for Basic Anesthetic Monitoring ASA House of Delegates 10/21/1986.
- ◆ Anesthesia Patient Safety Foundation 1984.

Harvey Cushing, 1869-1939



*Harvey Cushing, M.D.
(1869-1939)*



*Dr. Harvey Cushing's July 17,
1895 chart: "Did not vomit.
Not nauseated. Very quiet."*

Pulse Oximetry, 1973, 1983.



Takuo Aoyagi



Nellcor Pulse Oximeter

Modern Anesthesia Machine.





Anesthesia Mortality. ⁷

- ◆ 1:1000 in 1960.
- ◆ 1:240,000 in 2002



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References

- ◆ 1. And the Lord God caused a deep sleep to fall upon Adam, and he slept." Genesis 2:21 .
- ◆ 2. Matsuki A: Seishu Hanaoka, a Japanese pioneer in anesthesia. *Anesthesiol* 1970; 32:446-50.
- ◆ 3. Fenster J M: *Ether Day*. Harper Collins Publishers. New York, 2001.
- ◆ 4. Sykes: *Essays on the First Hundred Years of Anaesthesia*. Robert E. Kreiger Publishing Co. 1972.



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- ◆ 5. Wolfe & Menczer: *I Awaken to Glory*. Boston Medical Library, 1994.
- ◆ 6. Caton D: *What A Blessing She Had Chloroform*. Yale University Press, New Haven, 1999.
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