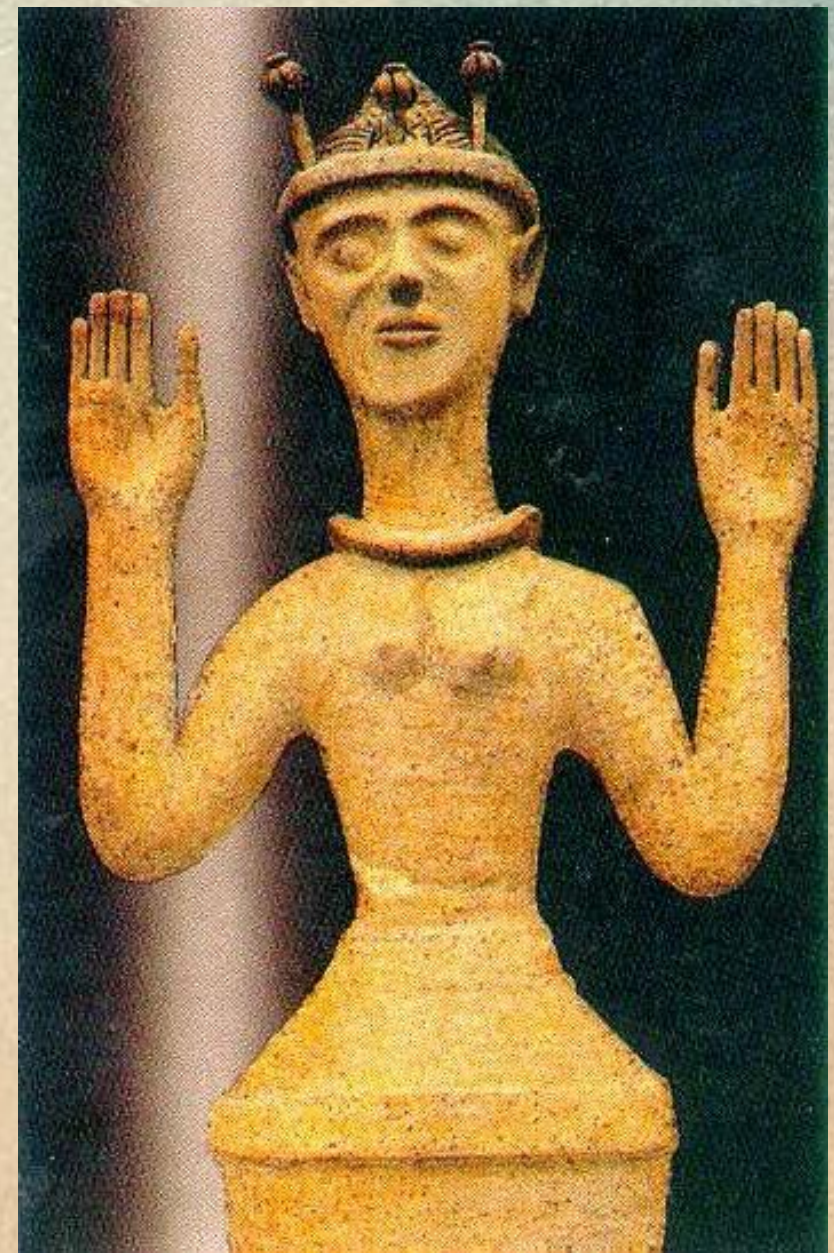
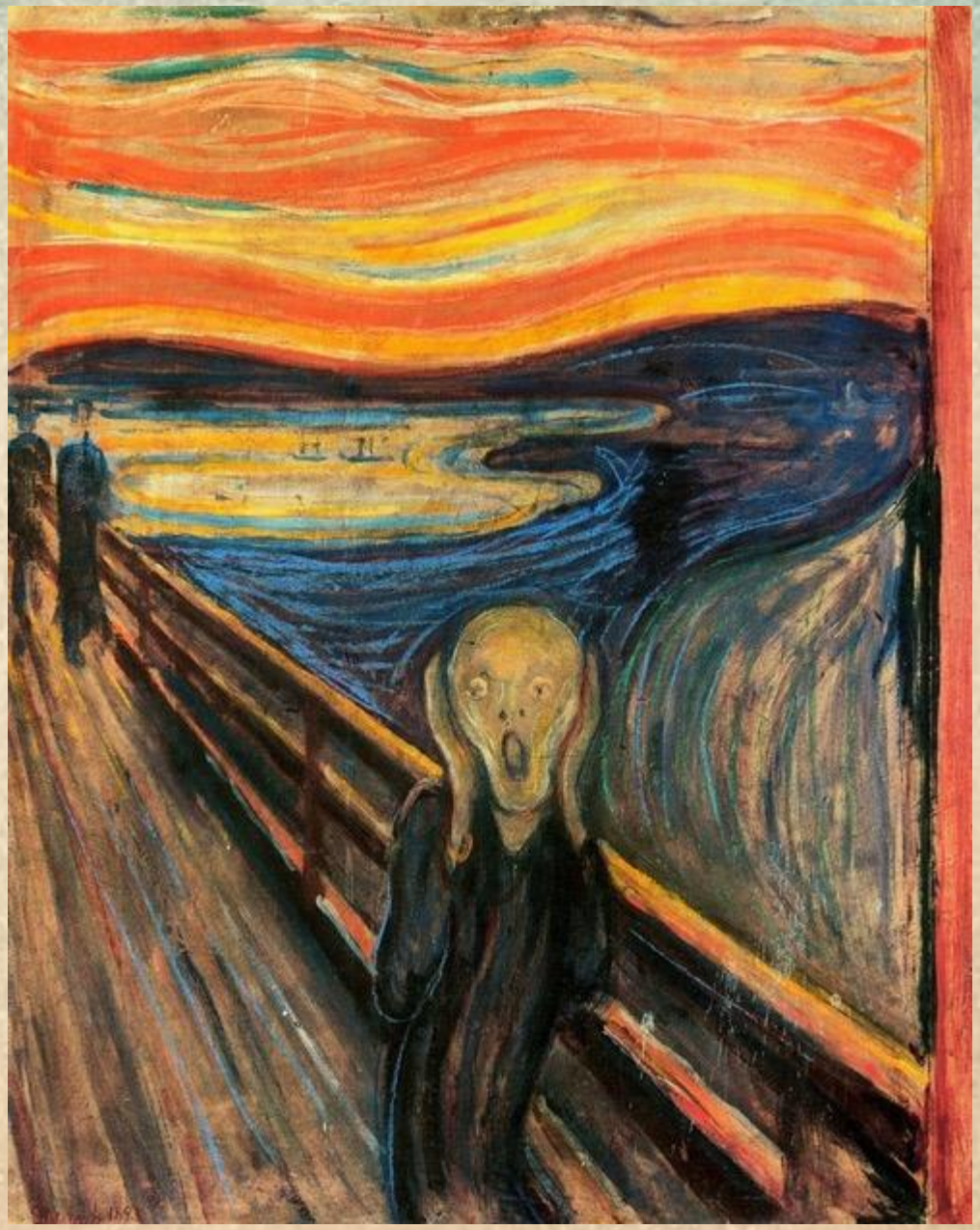
Physiological and psychological aspects of pain. History of local anesthesia

Arc- Állcsont- Szájsebészeti és Fogászati Klinika, BUDAPEST

- Statuette of moon-godess with garden poppies on her crown
  - /13th century B.C. Crete/



- Oral surgical intervention of a fighter
  - /IV. century B.C./



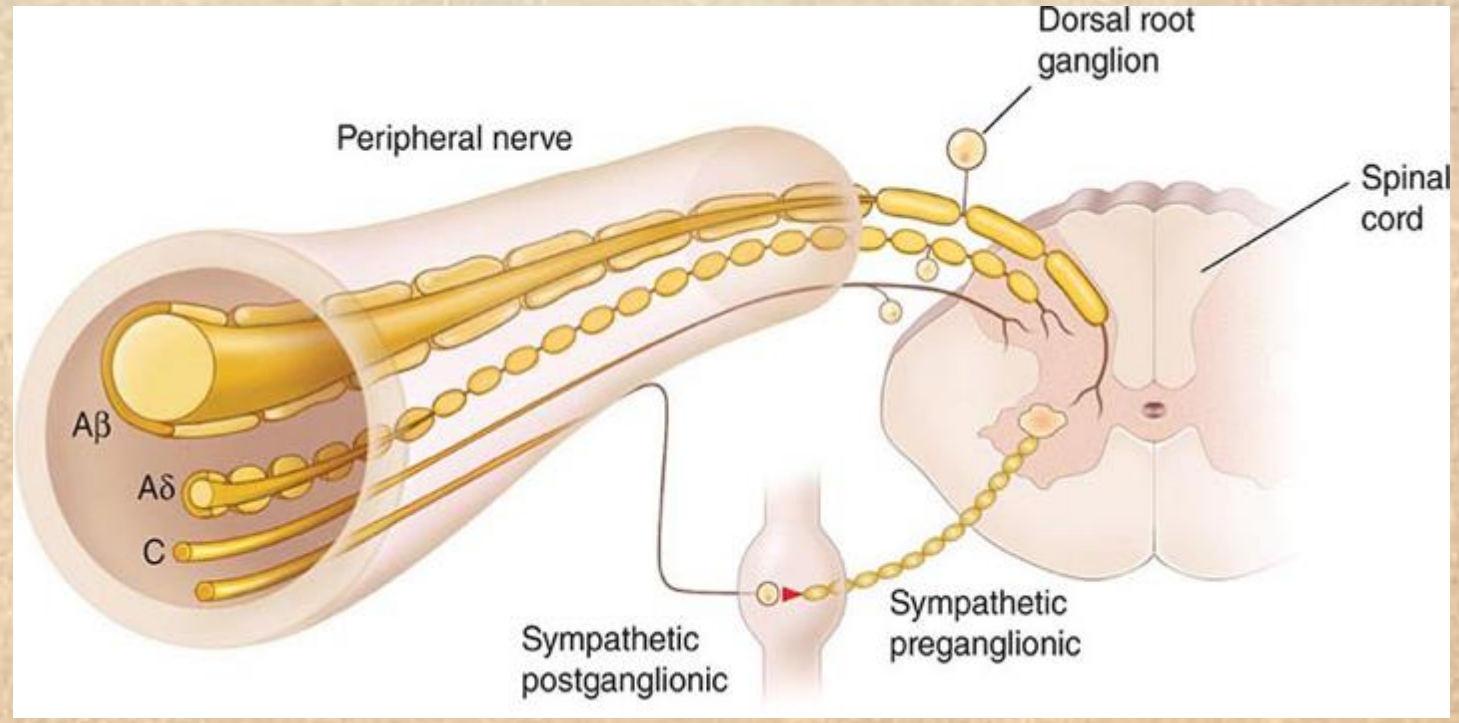
WHAT IS PAIN?

Unplesant experience which is provoked by real or potential damage to the body and tissues.

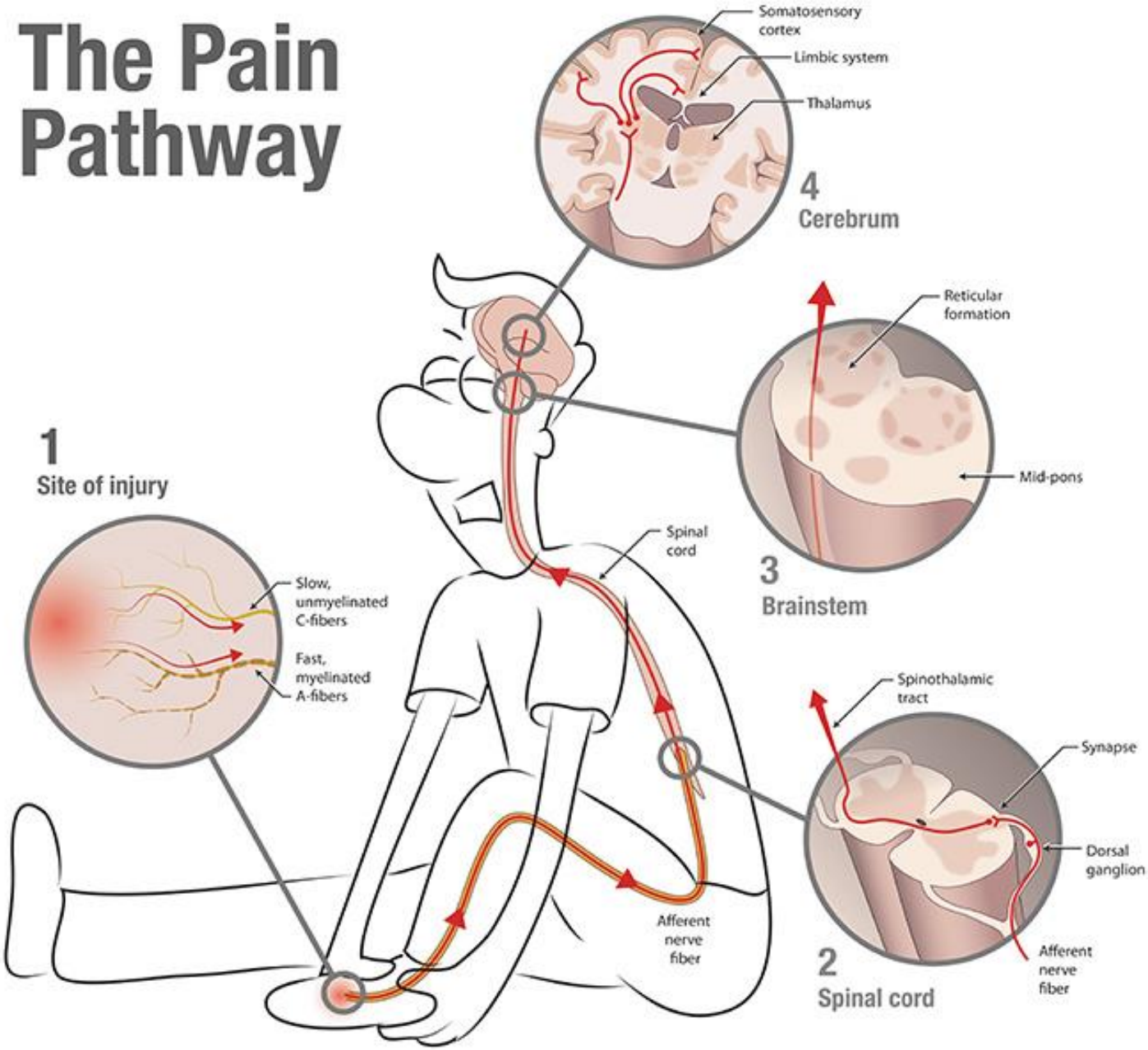
Pain is subjective and cannot be measured by any objective methods, thus we have to rely on patient's report.

- **A-delta myelinated thick fast transmitting fibers – responsible for transmission of sharp pain**

- **C-type unmyelinated thin slow transmitting fibers – responsible for transmission of dull pain**

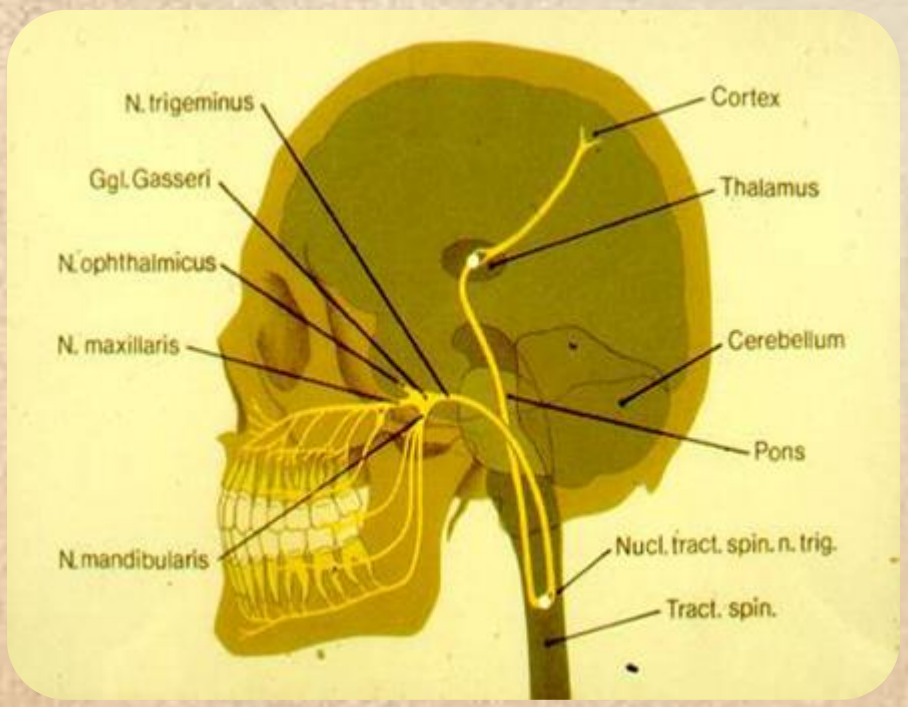


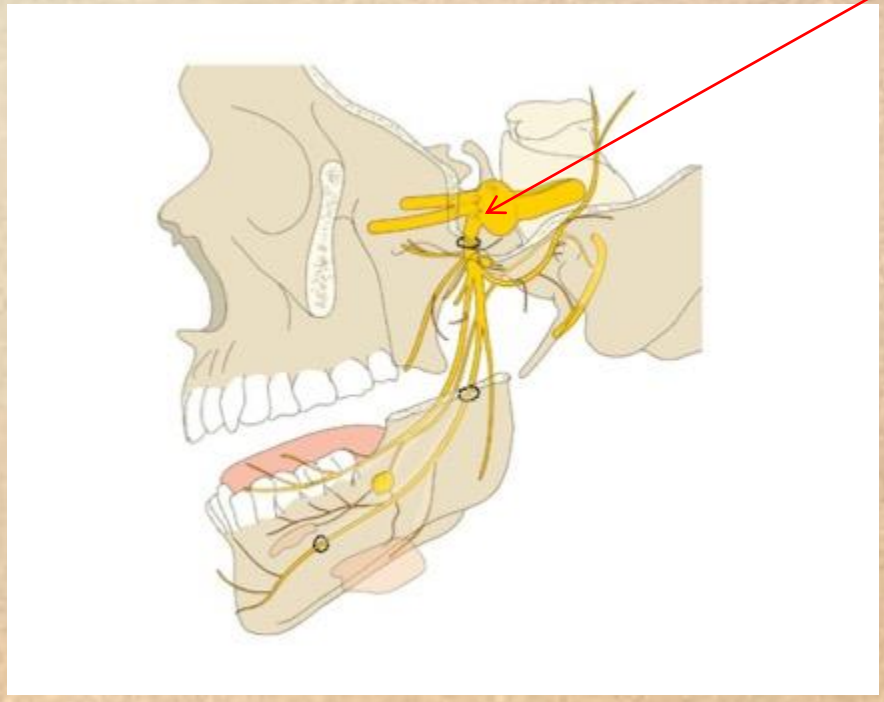
The Pain Pathway



PAIN TRANSMISSION IN THE MAXILLOFACIAL REGION

Painful stimuli from the oral and facial region are transmitted via periferal fibers of the trigeminal nerve into the Gasserian ganglion where the bogy of the first order neuron is located





PAIN TRANSMISSION IN THE MAXILLOFACIAL REGION

- The fibers of the first neuron synapse wit the second neuron in the **nucleus of spinal tract** **in medulla oblongata**
- The pain pathway continues into the **thalamus (!)** where the second neuron synapses in the **ventrolateral nucleus** with the third order neuron. From thalamus the pain is relayed to various centers in the brain

1. Hypothalamus
2. PAG
3. Amigdala
4. Basal ganglia

- From here pain information is referred to the various centers of the high cortex:
  1. Postcentral gyrus
  2. Frontal lobe
  3. Temporal lobe
  4. Reticular formation
  5. Cingulate gyrus

„PAIN MATRIX”

Fear is a negative emotion.
It is a protective mechanism for self preservation.
By nature a person is an anxious being

PAIN and FEAR

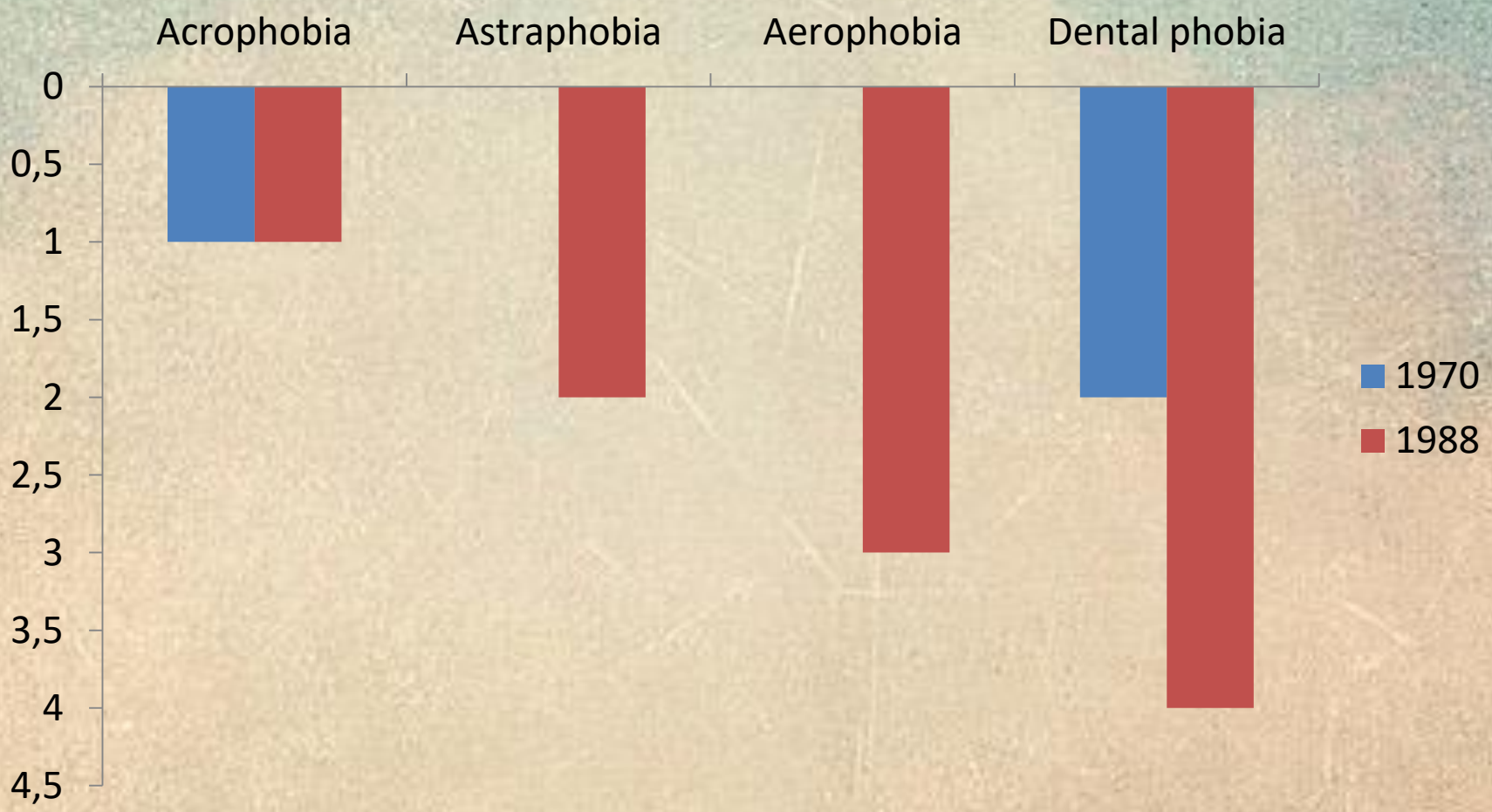
Pain is unpleasant sensory and emotional experience, caused by actual or potential damage to the body integrity. /IASP, 1979/

WHAT ARE WE AFRAID OF?

Fear is a negative emotion.
It is a protective mechanism for self preservation.

PHOBIA and FEAR

Phobia is an extreme irrational fear of specific objects, situations which a person can’t control.

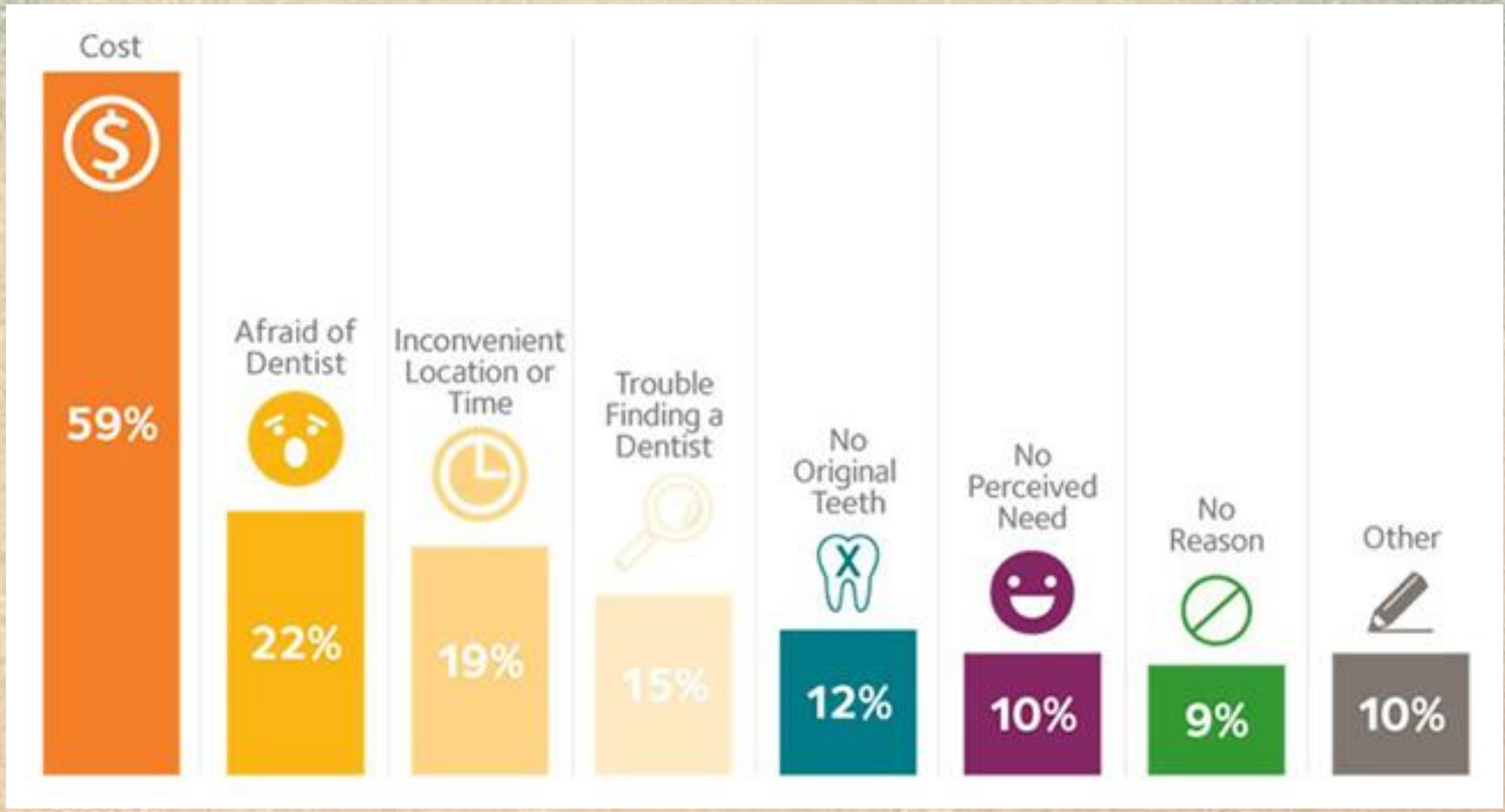


Agras and mtsai (1970)
Milgrom and mtsai (1988)

ODONTOPHOBIA

Caravaggio: the tooth puller (1609) *Palazzo Pitti, Firenze*

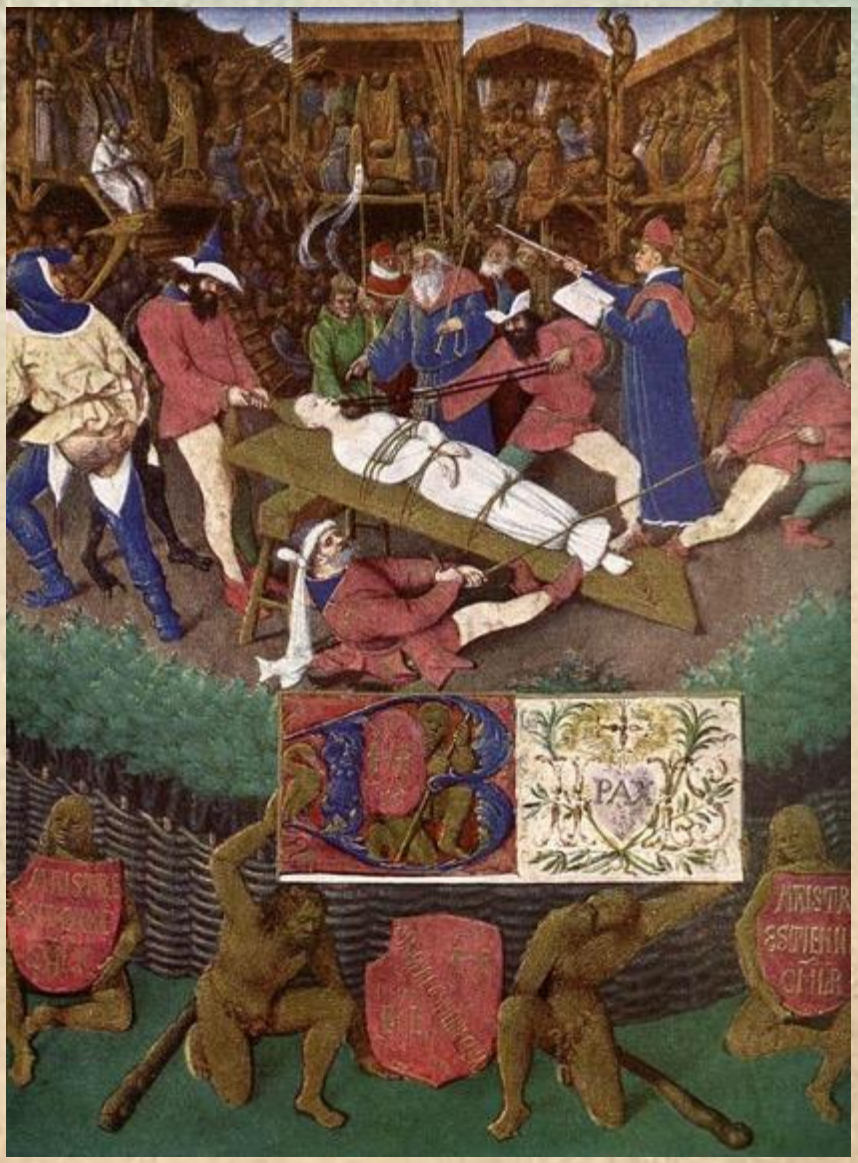
WHY PEOPLE DON'T VISIT DENTISTS?



ADA
AMERICAN DENTAL ASSOCIATION

A saint patron of toothache

Pietro della Francesca olajfestménye (1470*), National Gallery of Washington*



Jean Foquet: Martyrdom of Saint Apollonia (Hours of Etienne Chevalier) *Musée Condé, Chantilly*

ALLEVIATION OF PAIN (ANALGESIA)

Timothy Bobbin (John Collier) - A blacksmith extracting a tooth. /olajfestmény/

HISTORY OF ANALGESIA

MESOPOTAMIA

Poppy seed flower

- *Papaver somniferum (opioids)*

Mandragora

- Alkaloids (hypnotic, hallucinogenic)

CHINA



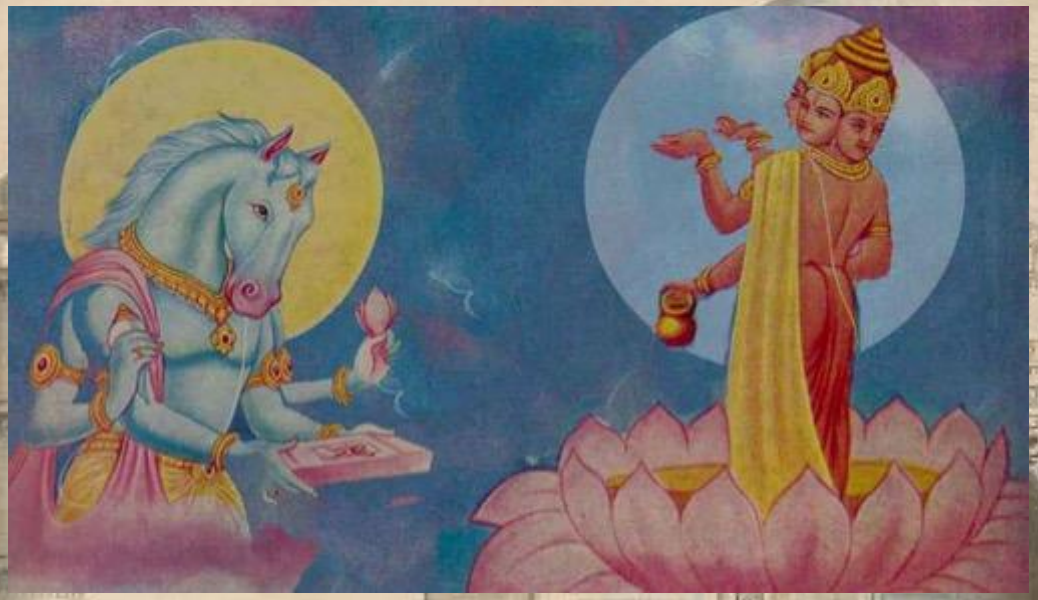


- Balance of 5
- 388 points of akupuncture

INDIA

RIGVEDA

AYUR-VEDA



BELADONNA (Hyosciamus)

INCA EMPIRE

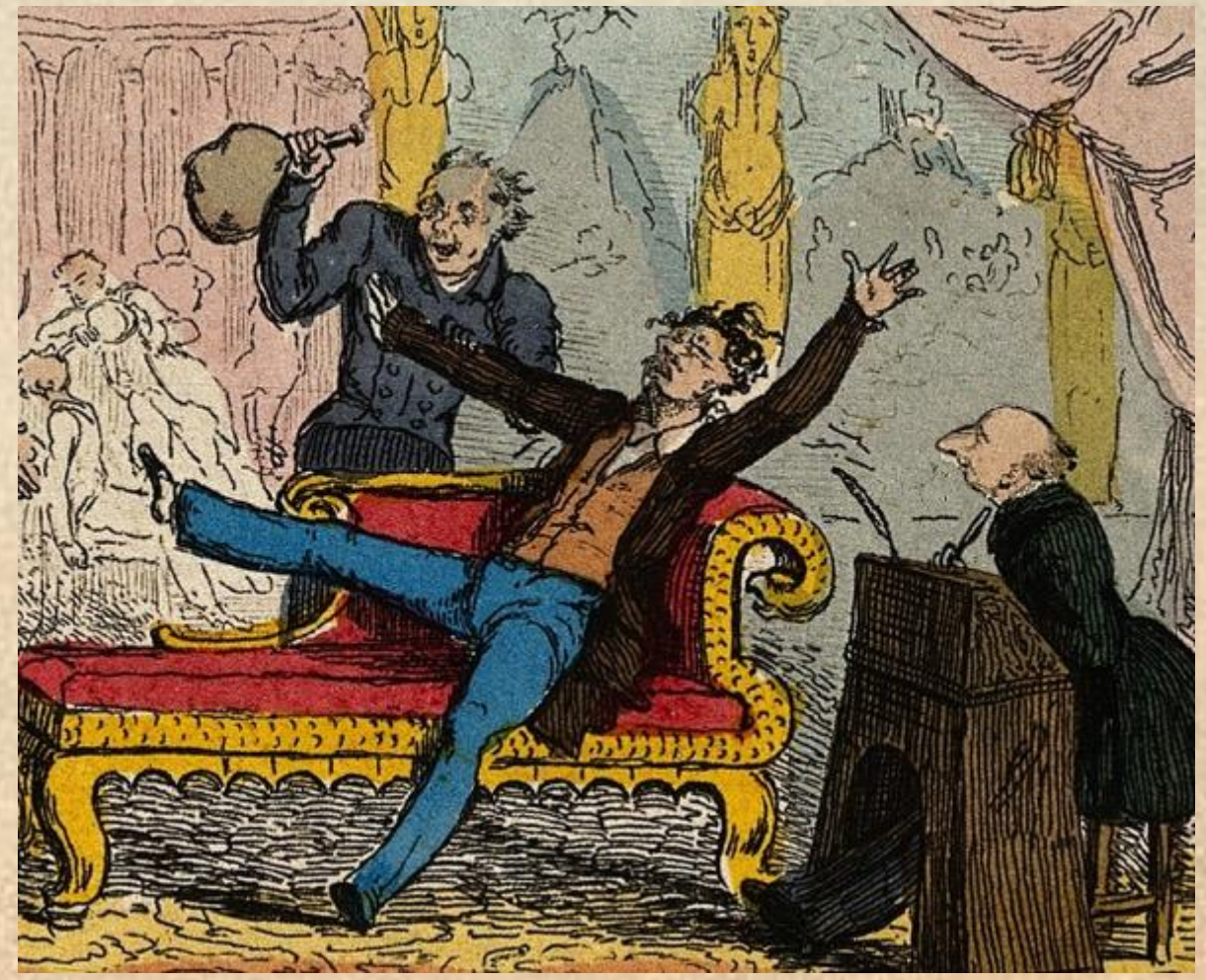
Coca plant

- Erythroxylon coca

EGYPT

- OPIUM
- MANDRAGORA
- BELLADONNA (ATROPIN)

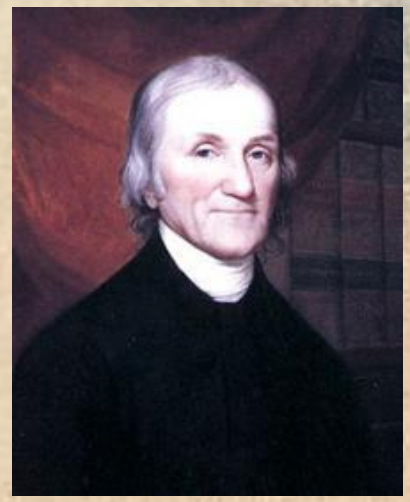
NEW CHAPTER IN ANALGESIA AND ANESTHESIA



- In XIX century experimental works to alleviate pain
- NARCOSIS and NARCOTICS

LAUGHING GAS (NITROUS OXIDE)

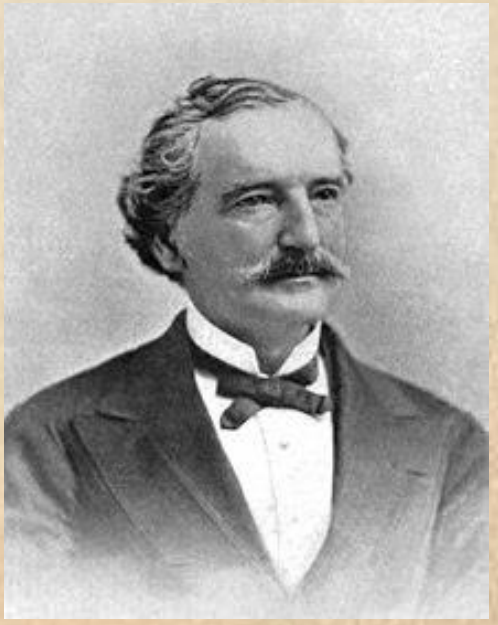
Discovered: *Joseph Priestley*, chemist (1772)



- Transparent
- Non-flammable
- Doesn’t react with other narcotic agents
- Good analgesic effect
- Superficial narcosis only
- Can only be used with oxygen (alone toxic)
- Slow onset of action
- Fast recovery

LAUGHING GAS (NITROUS OXIDE)

- *James Watts, Thomas Beddoes*
- *Humphry Davy*



EXHIBITION

OF THE EFFECTS PRODUCED BY INHALING

NITROUS OXIDE, EXHILERATING OR

LAUGHING GAS

WILL BE GIVEN AT The Masonic Hall

Saturday EVENING 15 April 1843

30 GALLONS OF GAS will be prepared and administered to all in the audience who desire to inhale it.

MEN will be invited from the audience to protect those under the influence of the Gas from injuring themselves or others. This course is adopted that no apprehension of danger may be entertained. Probably no one will attempt to fight.

THE EFFECT OF THE GAS is to make those who inhale it either

LAUGH, SING, DANCE, SPEAK OR FIGHT, &c. &c.

according to the leading trait of their character. They seem to retain sufficient reason enough not to say or do that which they would have occasion to regret.

N.B. The Gas will be administered only to gentlemen of the first respectability. The object is to make the entertainment in every respect, a genteel affair.

Those who inhale the Gas once, are always anxious to inhale it the second time. There is not an exception to this rule.

No language can describe the delightful sensation produced. Robert Southey, (poet) once said that "the atmosphere of the highest of all possible heavens must be composed of this Gas."

For a full account of the effect produced upon some of the most distinguished men of Europe, see Hooper's Medical Dictionary, under the head of Nitrogen.

The History and properties of the Gas will be explained at the commencement of the entertainment.

The entertainment will be accompanied by experiments in

ELECTRICITY

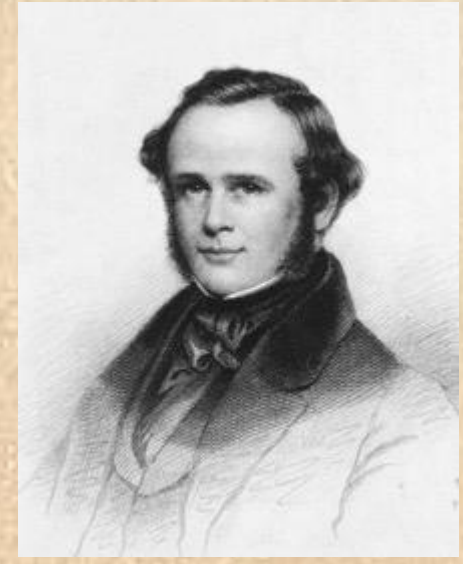
ENTERTAINMENT TO COMMENCE AT 7 O'CLOCK.

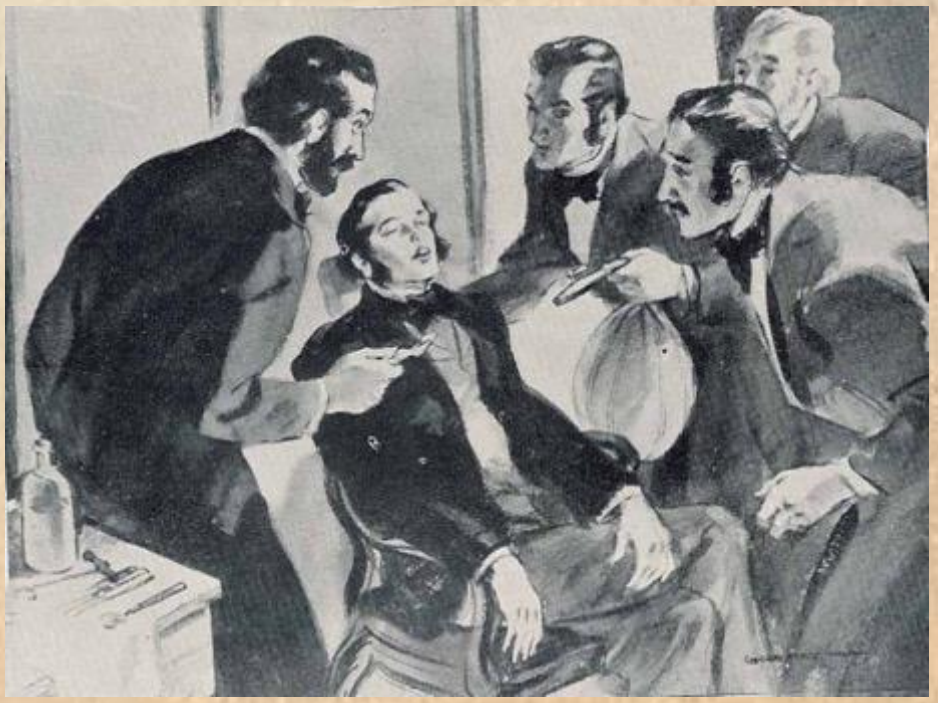
TICKETS 12½ CENTS,

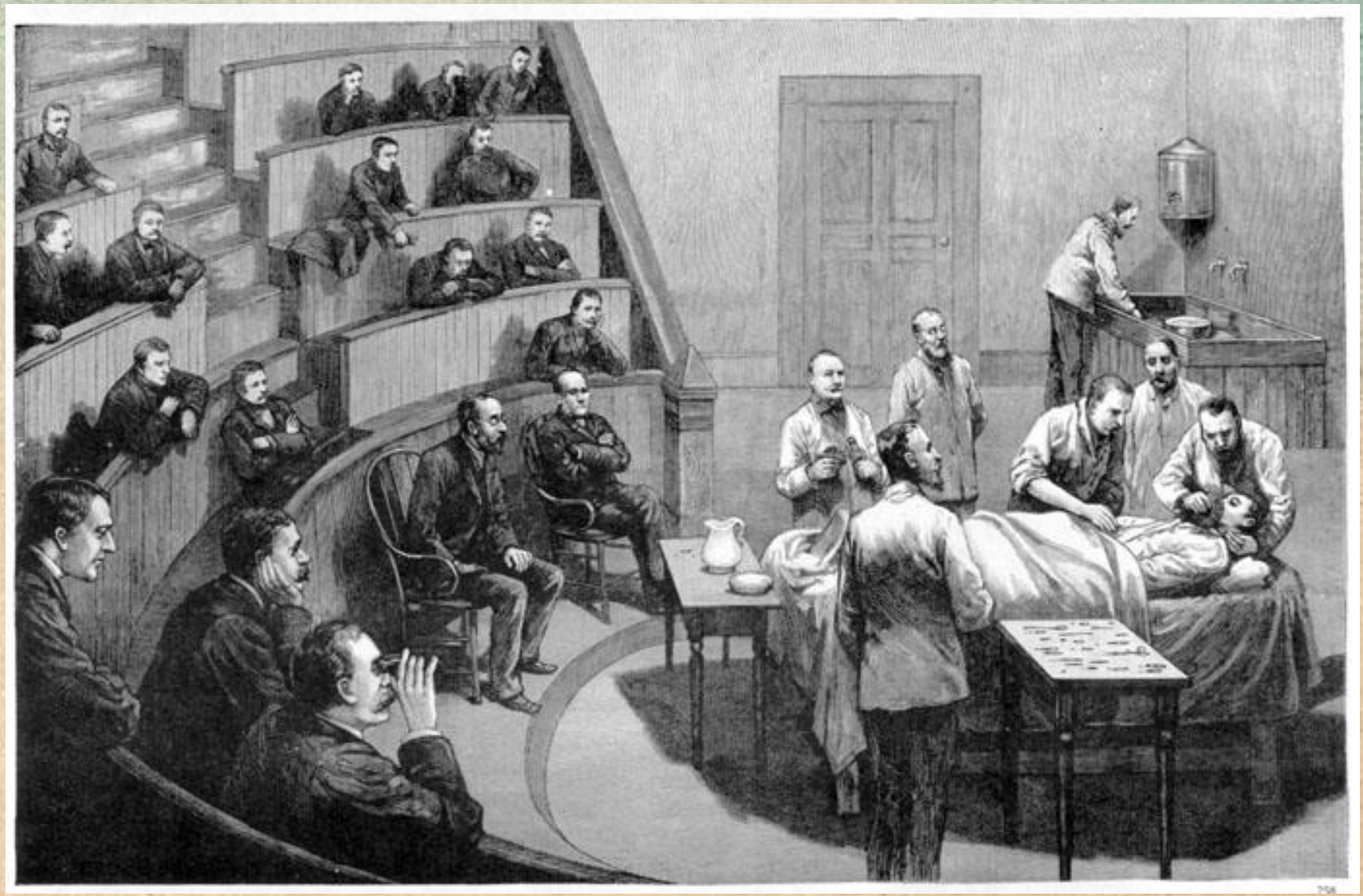
For sale at the principal Bookstores, and at the Door

LAUGHING GAS (NITROUS OXIDE)

- *Horace Wells (1844)*
- Tried on himself (his student Dr. Riggs removed his wisdom tooth)
- *Gardner Q. Colton (1863)*







LAUGHING GAS (NITROUS OXIDE)

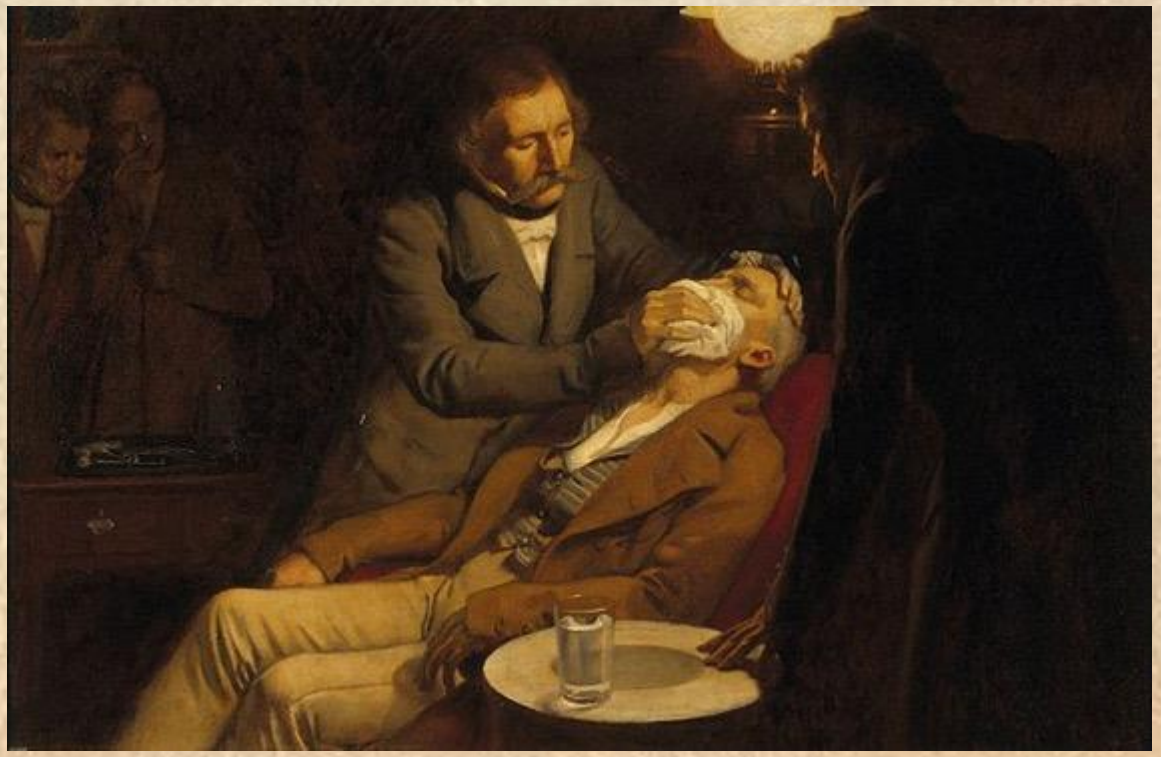
- Bikfalvi Máthé Domokos (BUDAPEST)
  - Was first to use on patients

ETHER EUPHORIA

- Transparent
- Volatile
- Specifc smell
- Flammable when reacts with air or pure oxygen
- Causes coronary vasodilation
- Increases salivary and bronchial secretion
- Increases blood sugar level

ETHER EUPHORIA

- *Crawford W. Long*- removed neck tumor under ether anesthesia (1842, Georgia), results were published in 1849
- William Thomas Green Morton, dentist (1846)



ETHER EUPHORIA

- 1846 Sulphur-Ether narcosis was introduced by John Collins Warren

- Louis Ombredanne demonstrated Ether narkosis machine in 1908

CHLOROFORM

- First was used in 1847 by *James Young Simpson, Scottish obstetrician professor*
- Paul Sudek, a german surgeon professor introduced an inhalator mask by which chloroform could be delivered into the airways

CHLOROFORM

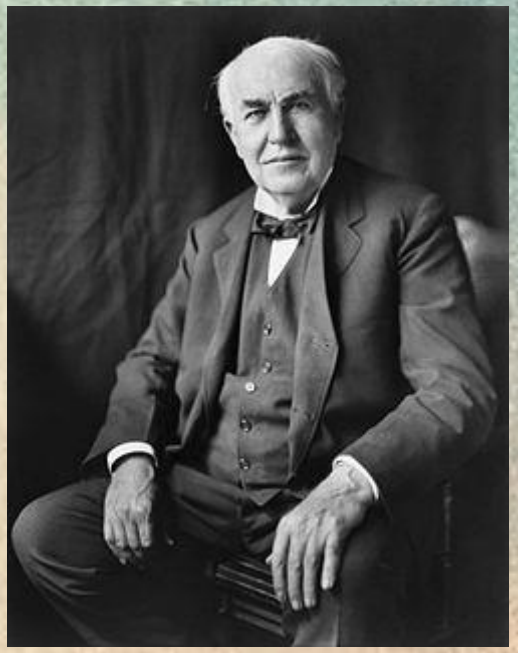
- *Ferdinand Adalbert Junker von Langeeg: costructed a chloroform narcosis machine*

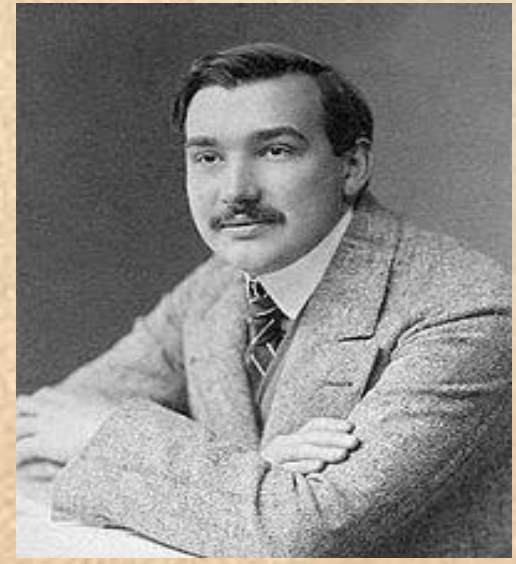
MIXED GAS

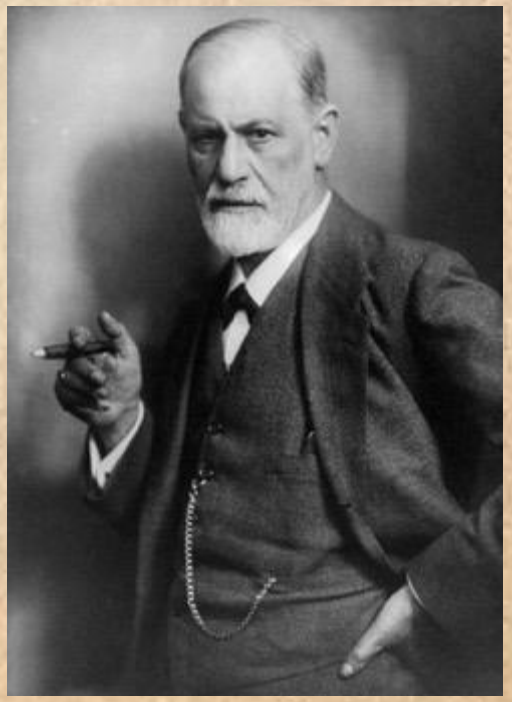
- dr. G Rolland- Zamnoform (ethyl-chloride, ethyl-bromide, methyl-chloride)
- Otto Roth and Heinrich Draeger – General anesthesia machine (1903)

A COCAINE

- *Wholer* and *Niemann* (1860) - isolation
- Use for recreational purposes





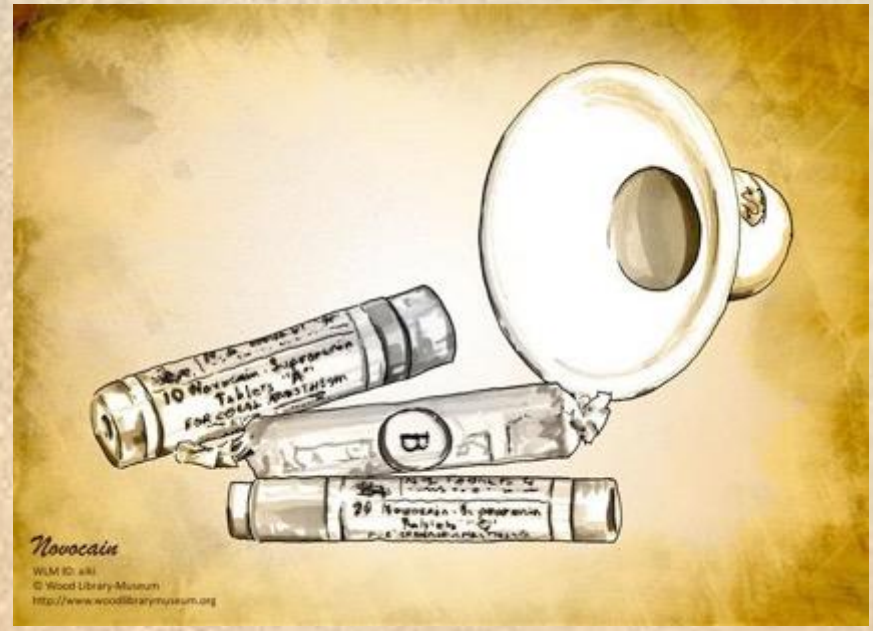


COCAINE, LOCAL ANESTHETIC

- 1884: *Karl Koller*- 2% solution in ofthalmology
- 1885: *Halstead* - 5% solution for block anesthesia
- 1885: James leonard Corning – peridural anesthesia
- 1890: Dőri Ferenc, 20% solution for tooth removal
- Abonyi József - 15% solution for gingival terminal anesthesis
- 1898: Heinrich Quincke – spinal anesthesia

NOVOCAINE (PROCAIN)

- 1905 A. EINHORN

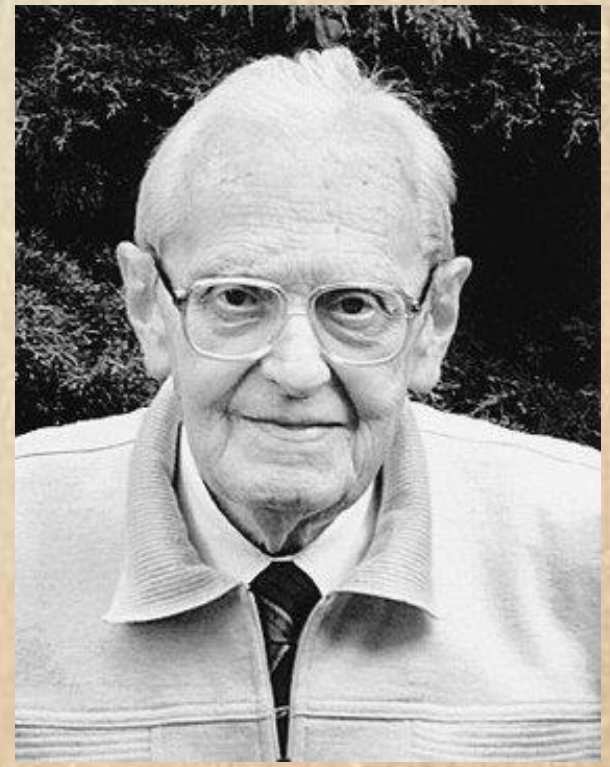


LOCAL ANESTHETICS IN DENTAL PRACTICE

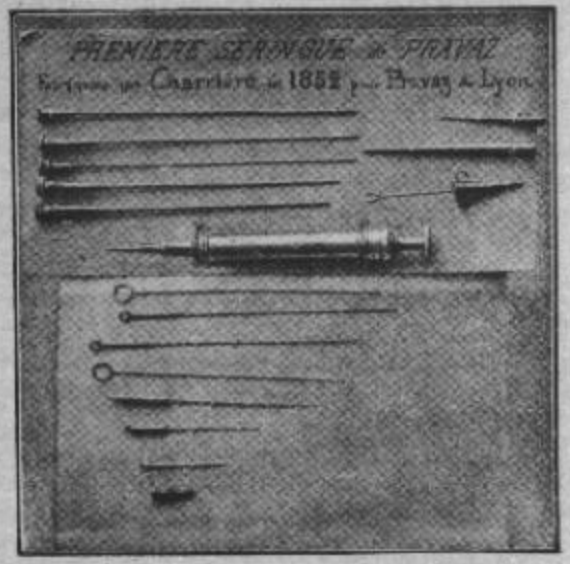
- **Lidocaine** /*Nils Löfgren, 1943*/: in use since **1946**
- **1957:** Mepivacaine
- **1960:**Prilocaine
- **1963:** Bupivacaine

LOCAL ANESTHETICS IN DENTAL PRACTICE

- **ARTICAINE** (1969) – used in dentistry from **1975**
- Roman Muschaweck



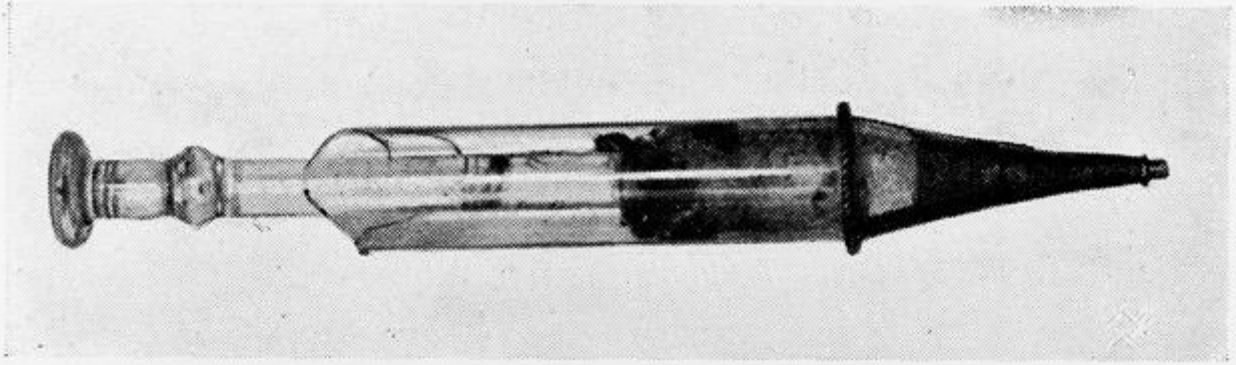
Charles-Gabriel PRAVAZ



La première seringue de Pravaz avec ses accessoires.

PRAVAZ naquit le 24 mars 1791, à Pont-de-Beauvoisin (Isère), petite ville située sur une gracieuse rivière : Le Guiers, descendu du Massif de la Chartreuse, aux confins de la Savoie et du Dauphiné.

inventeur de la seringue pour injection médicamenteuse



ORIGINAL HYPODERMIC SYRINGE OF

DR. ALEXANDER WOOD

THE FIRST USED IN GREAT BRITAIN

TYPES OF LOCAL ANESTHESIA

1. Terminal anesthesia
   - Superficial (mucosal) anesthesia
   - Submucosal infiltration
   - Subperiosteal infiltration
   - Intraligamental anesthesia

2. Block aneshesia

3. Ganglionic block

LOCAL ANESTHESIA IN DENTISTRY