Medico-biological field of medicine MODERN TIMES (1640—1918)

The new time is identified with the period of establishment and development of capitalist relations and limited conditional chronological framework 1640-1918 years.

- 1640 - the year of the beginning of the English bourgeois revolution. It defines the boundary between the Middle Ages and the new time.
- 1918 - year of the end of World War I (1914 - 1918). admitted to the world historical science as the divide between modern and contemporary history.

Features development of medicine

- Development of scientific knowledge (mechanics, physics, chemistry) has a huge influence on the medicine formation.
- Great importance has also the activity of medical materialists Henri Leroy, Julien La Mettrie and Pierre Cabanis - prominent representatives of the French school of mechanistic materialism.

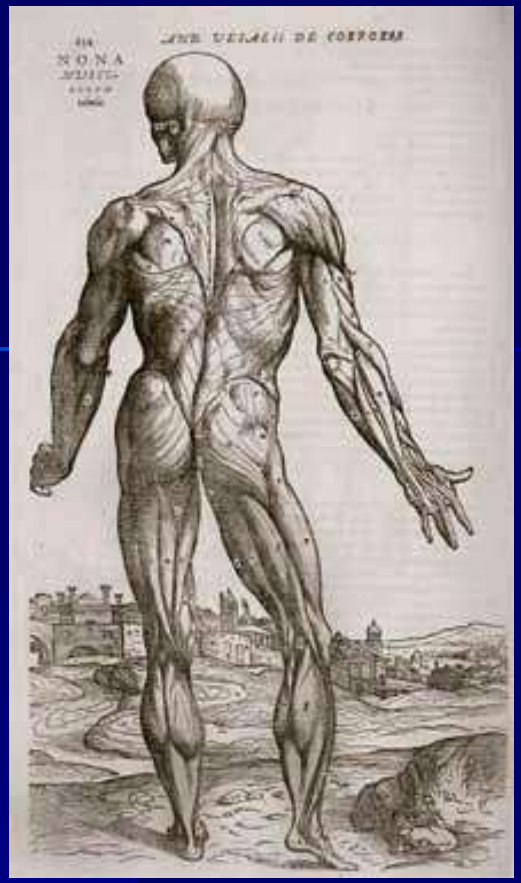
The great scientific discoveries of the late 18th-first half of the 19th c., that have had a decisive importance for the development of medicine:

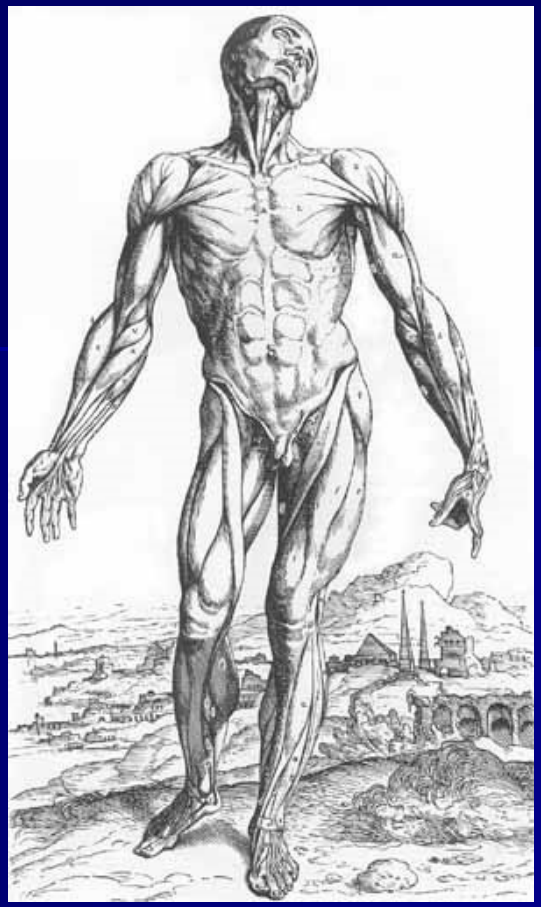
1. The theory of the cellular structure of living organisms Schleiden and Schwann,
2. The law of conservation and transformation of energy,
3. The evolutionary theory of Charles Darwin

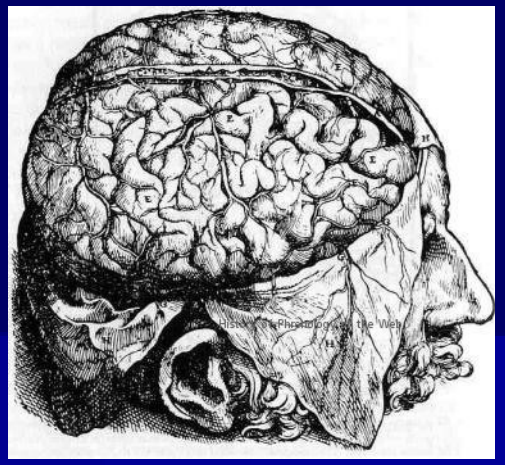
ANATOMY

Andreas Vesalius - the founder of the science anatomy.

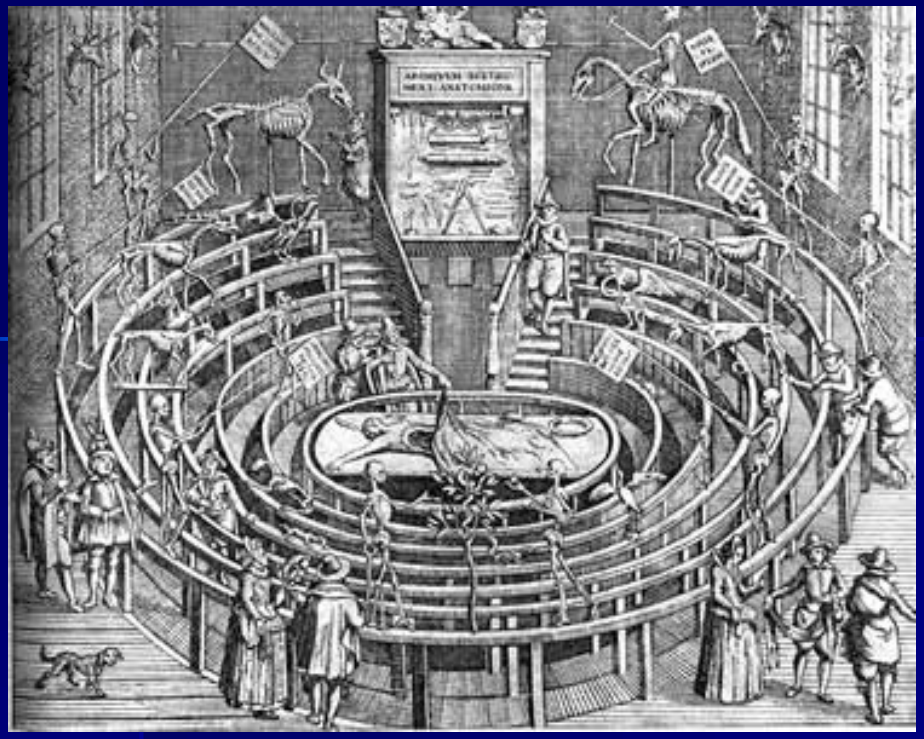
- Corrected mistakes of his predecessors,
- He has widened, generalized and systematized the anatomical knowledge







Anatomical drawings A.Vezalius



After Vesalius became widespread dissection of cadavers for research, teaching students, as well as public demonstrations to colleagues and students. For this purpose special anatomical theaters were built.

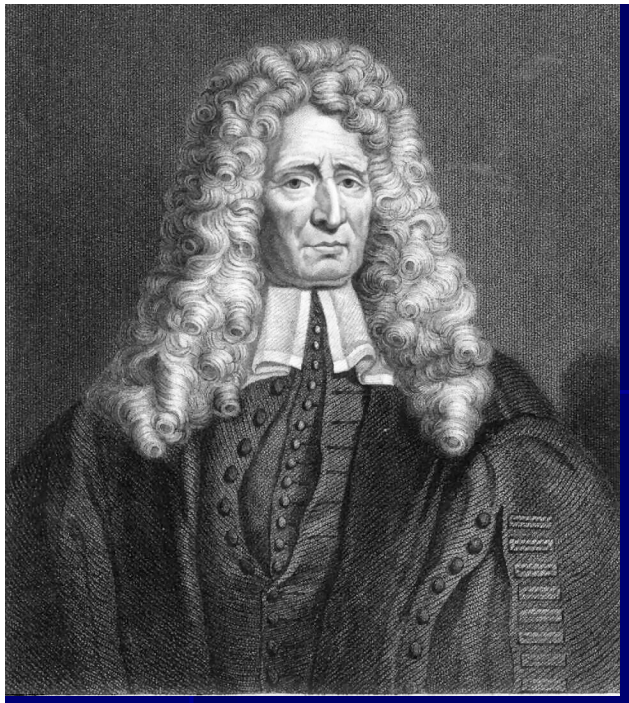
Anatomical Theatre

In the 17th century in the walls of the University of Leiden (Netherlands) formed the largest anatomical school

The pupil of the Leyden school was a Dutch anatomist and surgeon from Amsterdam Nicholas Tyulp:

- He conducted research on the comparative anatomy;
- For the first time he studied the structure of the anthropoid ape in comparison to the human body.

This is his statement: "to shine for other is to burn myself."



He was elected a member of the German Academy "Leopoldina", Royal Society of London and the Paris Academy of Sciences.

Frederick Ruysch - one of the followers of A. Vesalius:

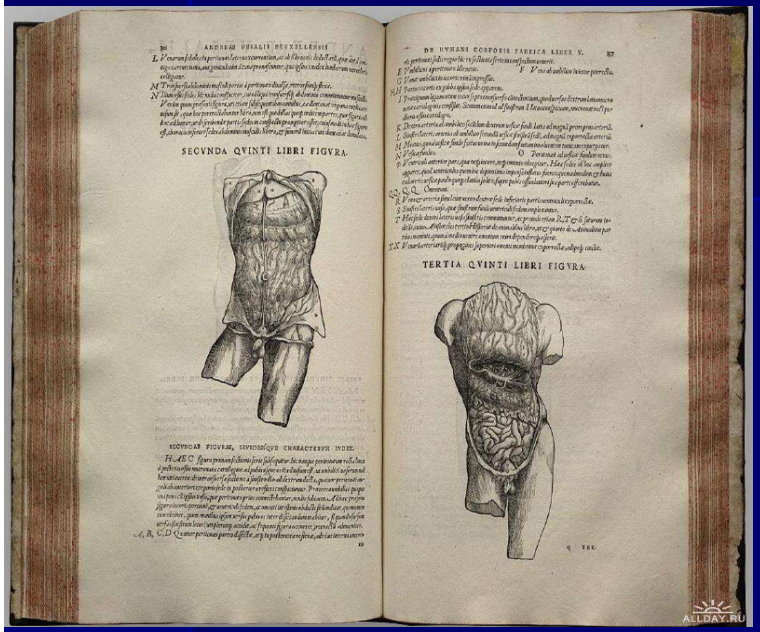
1. Mastered the technique of preparation of anatomical specimens (preparations) and the method of injection blood vessels by colored and solidified liquids,
2. He invented an original way of embalming corpses,
3. Personally assembled a unique collection of museum exhibits (congenital anomalies and malformations)
4. Created the first anatomical museum.

Development of Anatomy in Russia

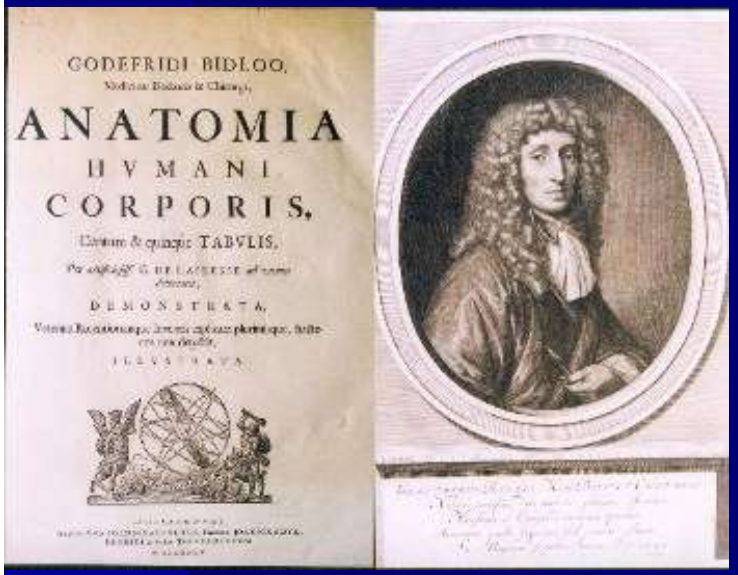
- In Russia, the start of anatomical dissections associated with the rule of Peter I.
- IN Amsterdam, Peter I attended lectures and anatomical museum Ruysch, operations and anatomical dissection.
- 1699 - Peter I founded in Moscow the course of anatomy lectures for the boyars with the demonstrations on cadavers.

In 1717, Peter I bought Ruysch's anatomical collection (about 2 thousand exhibits). It marked the beginning of the first Russian museum funds. The museum was named "Curiosities".

By decree of the king (1718), this collection began to grow and replenish with the works of Russian scientists.



- 1658 - the first translation of a treatise on anatomy into Slavic language. The monk Epiphany Slavinetsky translated the book Vesalius "Epitome" and called it "Vrachevskaya anatomy" (from the Russian word «врач» - doctor).



Early 18th century - Especially for Peter I was translated into Russian the famous anatomical atlas by Gottfried Bidloo "Anatomy of the human body in the 105 tables."

Martyn Ivanovich Shein

In 1744, he amounted the first national atlas of anatomy in Latin, in which he composed most of the illustrations.

1767 - for the first time translated into Russian "Compendium Anatomieuai" by Laurence Heister. The book became the first guide to the anatomy in Russian.

He laid the foundations of Russian scientific medical terminology, which did not exist before him.

- **Konstantin Shchepin - first professor of anatomy, began teaching medicine in Russian.**
- **Alexey Protasov - the first Russian anatomist academician, he was the student of Mikhail Lomonosov.**
- **Aleksandr Zagorski - academician, created the first Russian anatomic school at the St. Petersburg (Medical-Surgical Academy).** He developed the Russian anatomical terminology (instead of Latin). Created the first domestic original guidance for Anatomy "Reducing anatomy....." in Russia.

I.V. Buyalsky

- 1828 - published "anatomist-surgical tables" (14 tables and 36 figures depicting the bodies of a life-size).

Tables combined data of topographic anatomy and operative surgery, were the first in the Russian domestic atlas of operative surgery.

Buyalsky was a master of anatomy and brilliant surgeon. He created a new surgical instruments, developed methods of embalming the corpses, offered new methods for making "thin" anatomic preparations.

- Among the first Russian surgeons Buyalsky applied anesthesia, starch bandage and antiseptic agents.
- He has developed a number of new surgical procedures (on the upper jaw, blood vessels, etc.).
- Monographs: "Short general anatomy of the human body", "Anatomical notes for students of painting and sculpture at the Imperial Academy of Arts."

N.I. Pirogov - a great anatomist and surgeon, founder of topographical anatomy, an innovator method "ice" Anatomy of frozen corpses.

- At the end of the 19th century formed the Russian major anatomical research centers:
- Moscow University - School of DN Zernov - the study of the anatomy of the central nervous system;
- Kiev University - School of VA Betz - the doctrine of the architectonics of the cerebral cortex.
- Petersburg - PF Lesgaft - the founder of theoretical anatomy and domestic science about the physical education. He argued that the form is constantly changing under the influence of the functions and conditions of nutrition. Perfect form of healthy organism is directly dependent on the active influence of exercises which were developed the scientifically.

HISTOLOGY

(from the Greek histos- tissue, logos- teaching)
science of the structure, development and functioning of living organisms tissues.

Becoming the Histology is closely linked with the development of microscopic techniques and microscopic studies, the cell theory of the organisms structure and the doctrine of the cage.

In history of doctrine about tissues microscopic structure and organs distinguish two periods :

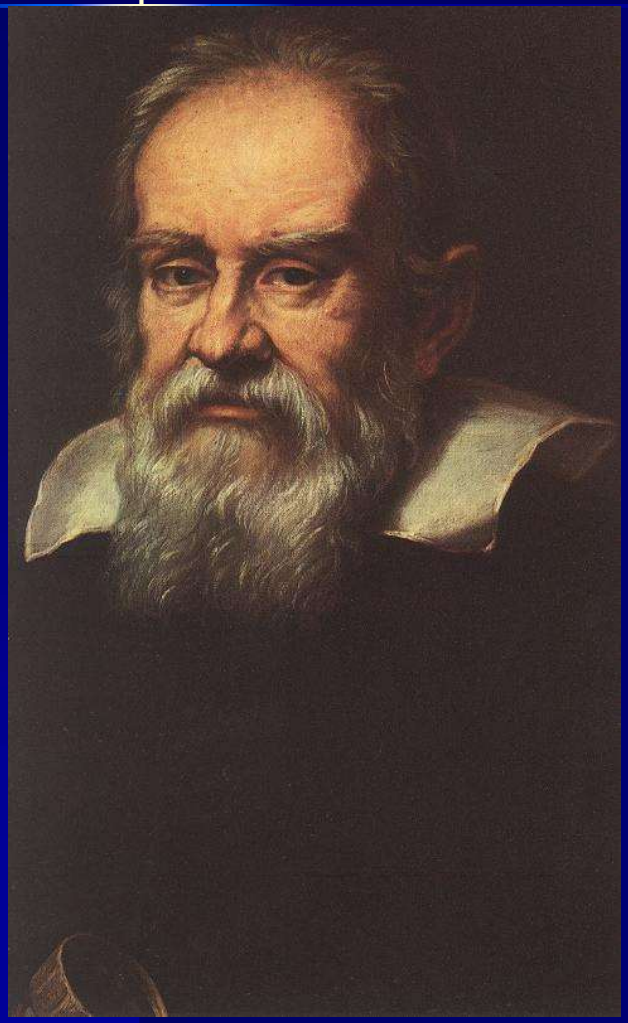
until microscopic

microscopic.

Until Microscopic PERIOD

1. The first presentation of the tissues are formed on the basis of anatomical studies corpses.
2. The first scientific generalizations made without a microscope.
3. Born and created a microscopic technique (the use of magnifying glasses and the creation of the first microscopes).
4. Accumulated first fragmentary information about the microscopic structure of individual cells.

1590, Netherlands - Hans and Zachary Yanseny - designed the first device from the magnifying glass.



1609 - Galileo Galilei - designed optical instrument, which had a 9-fold increase. The demonstration of his invention in Venice has made great impression. Its optical system Galileo applied to study the structure of various objects and observing planets.

Robert Hooke

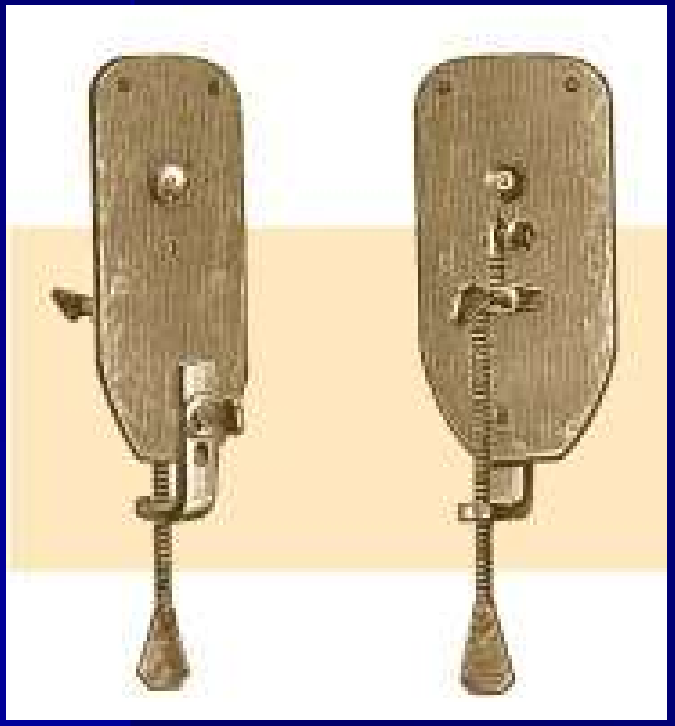
in 1625 - used the term microscope in the natural sciences

1665 - first discovered and described plant cells at the cut cork, using a microscope with a magnification of 30 times.

Marcello Malpighi - Italian physician, anatomist and naturalist.

Discovered capillaries, described blood cells.

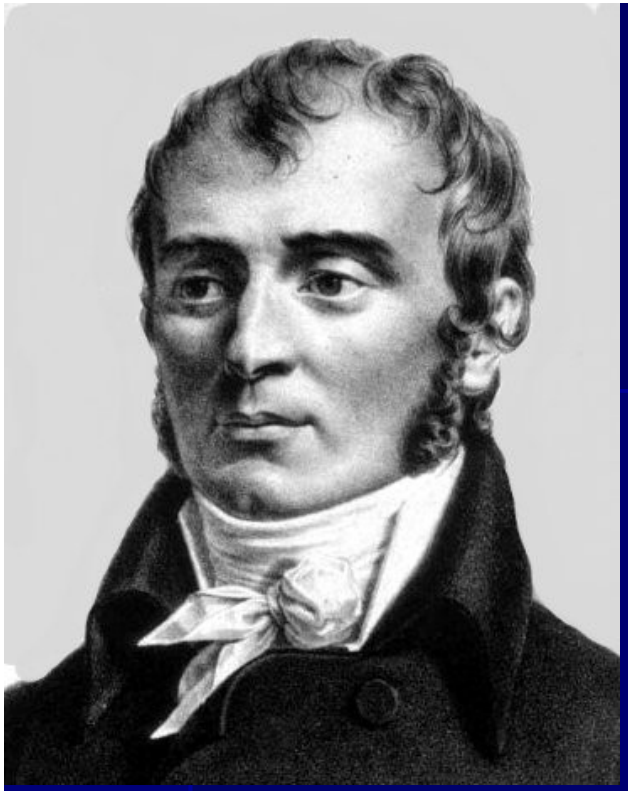
Renal corpuscles and epidermis bears his name



Antonie van Leeuwenhoek - Dutch naturalist.

He polished optical glass and reached a high perfection in the manufacture of short-focus lens, which made magnification up to 270 times.

- He first saw and sketched red blood cells, sperm, bacteria, certain plant and animal cells.



Marie François Xavier Bichat - French physician, regarded as the founder hystology as a science.

- Made the first attempt systematize the tissues of the body (without the use of a microscope).
- Noted 21 tissue "system" and described them in detail in his work "Treatise on the membranes and shells" and "General Anatomy in the annex to physiology and medicine."
- Together with cartilages, bones and other tissue of the "system", he divided the hair, the circulatory blood system .

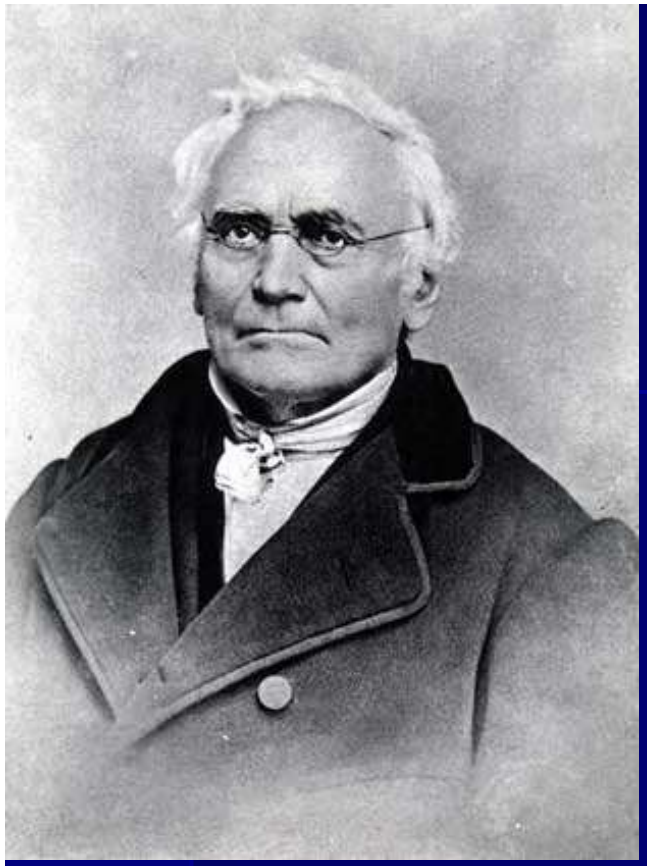
Microscopic PERIOD – the period systematic microscopic examination of tissues

Cell theory of the structure of organisms - one of the largest natural science generalizations 19th century

Cell theory was formulated in the writings of German scientists - botanist Matthias Schleiden and the zoologist Theodor Schwann.

- 1838 - Schleiden in his article "Materials for the biogenesis" showed that each plant cell has a nucleus, and defined its role in development and cell division.

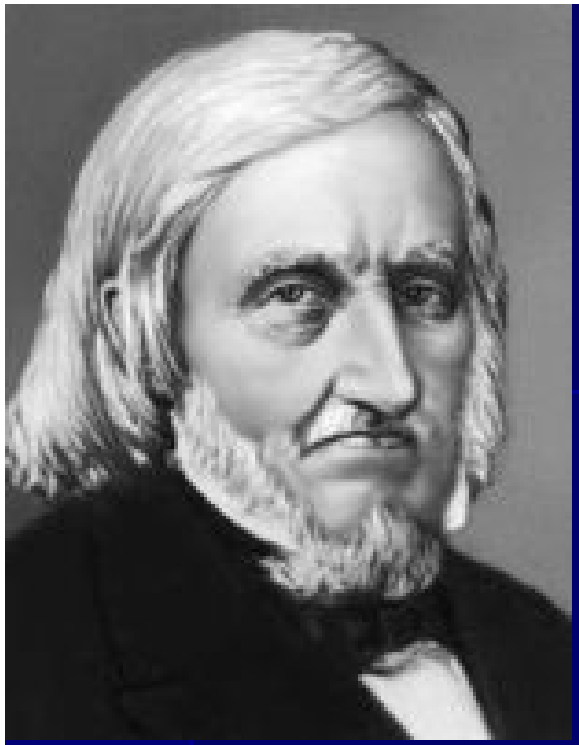
- 1839 – Schwann published an article "Microscopic examination of conformity in the structure and growth of animals and plants", in which he determined the the cell as a universal structural unit of flora and fauna, showed that plant and animal cells are homologous in structure, similar in function and gave the main characteristics of their formation, growth, development and differentiation.



Jan Evangelista Purkinje Czech scientist, one of the cellular structure founders.

The founder of the Prague School of histological, an honorary member of many foreign academies and scientific societies.

For the first time saw the nerve cells in the gray matter of the brain. He describes the elements of glia, identified large cells in the gray matter of the cerebellar cortex, this cells bears his name, he discovered fiber conduction system of the heart (Purkinje fibers).



К. М. Бэр - эмбриолог, читал первый курс гистологии в России, заведовал кафедрой сравнительной анатомии и физиологии в Медико-хирургической академии в Петербурге.

1852г. - гистология была выделена в самостоятельный курс, который читал **Н. М. Якубов**.

Первые кафедры гистологии и эмбриологии в России были организованы в 1864г. в Московском и Петербургском университетах. Позднее они были созданы в Казани, Киеве, Харькове и других городах страны.

ЭМБРИОЛОГИЯ

(от греч. embrion - зародыш, logos — учение) учение об эмбриогенезе — внутриутробном развитии плода от момента оплодотворения до рождения.

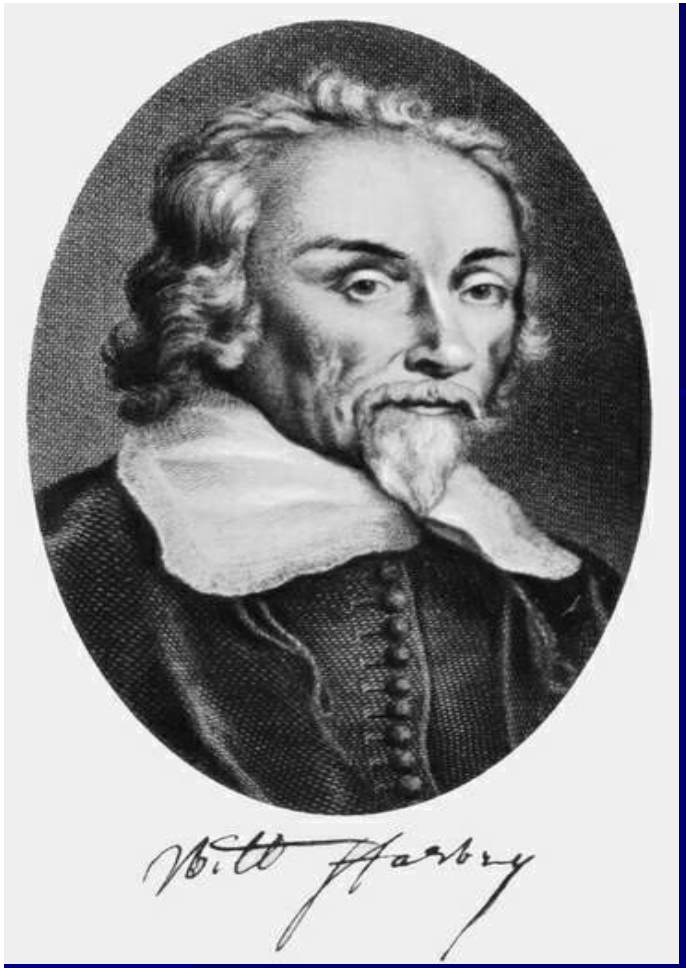
В процессе становления содержание и объем этой науки значительно расширились — предметом ее изучения стали также развитие и строение половых клеток и ранний постэмбриональный период.

Первые представления о внутриутробном развитии плода возникли в Древнем мире и изложены в сочинениях философов и врачей древней Индии, древнего Египта и древней Греции.

- **Преформизм** (от лат. - заранее образовывать) – предположение, что в отцовском или материнском «семени» в миниатюре предсуществуют все части будущего плода, т. е. существует маленький, не видимый глазом человек, который в процессе развития лишь увеличивается в размерах (**Анаксагор**)

- **Эпигенез** (от лат. - происхождение) - утверждение, что органы будущего плода развиваются из оплодотворенного яйца путем последовательных преобразований. Впервые выступил с этим предположением **Аристотель**.

Концепции преформизма и эпигенеза долгое время существовали параллельно.



U.Garvey - English physician, physiologist and embryologist.

- With his name is associated with the birth of the embryology science.
- In 1651 - "Research on the origin of animals." After studying the development of chicken and some mammals, Harvey rejected the idea of spontaneous generation and put forward reasoned arguments against preformation.
- He summed up the idea of the egg as the source of all the animals.

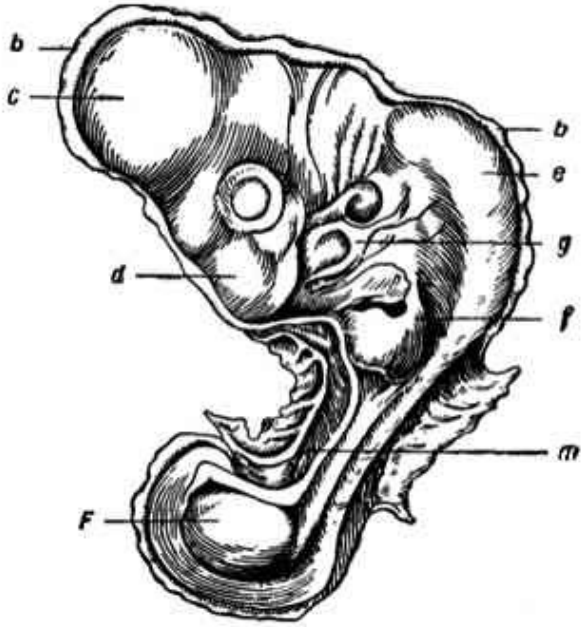
Regnier de Graaf - Dutch anatomist and physiologist.

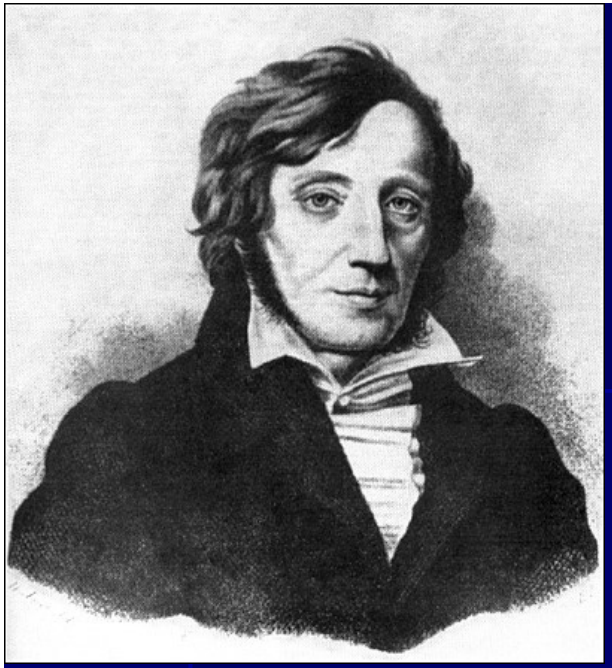
- Has contributed to the development of anatomy, physiology, histology and embryology.
- For the first time studied the seminiferous tubules and identified them as "blood vessels that produce the seed."
- In 1672 he described the female bubbles - gonads. Earlier mistakenly called an egg, hence the name "the ovaries."

Caspar Friedrich Wolff in 1767 arrived in St. Petersburg Academy of Sciences and worked until his death in Russia. Developed and experimentally substantiated theory of epigenetic.

He proved that the egg does not contain preformed embryo. He singled out two sheets of embryonic tissue and showed that the alimentary canal is formed from the lower sheet , which does not exist in the early stages of development.

He supposed that the central nervous system is formed from the top sheet, and that all other organs are formed as a result of a gradual structural differentiation of the organism in the process of fetal development.



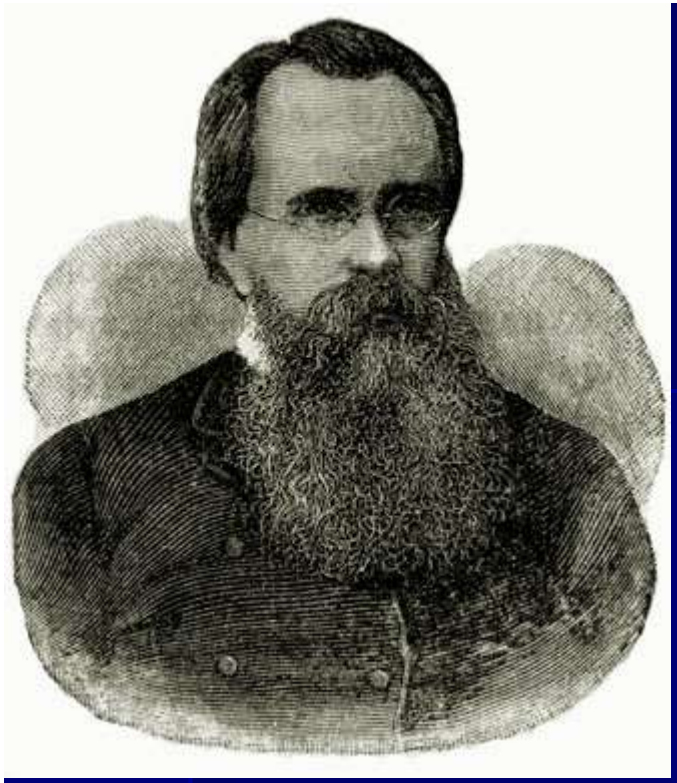


Research Baer definitively refute the concept of preformation. His work laid the foundations of comparative embryology of vertebrates.

K.M. Baer academic and honorary member of the St. Petersburg Academy of Sciences, discovered the basic laws of vertebrate embryogenesis.

I first saw and described the egg mammals and humans, has researched and described the development of all basic organ systems of vertebrate germ layers.

- He showed that in the process of fetal development firstly appears the property type, then the class unit, etc .; species and individual symptoms appear at later stages of embryogenesis.
- Human embryo develops similarly to all vertebrates.



Kovalevsky Alexander Onufrievich

Academician of the St. Petersburg Academy of Sciences.

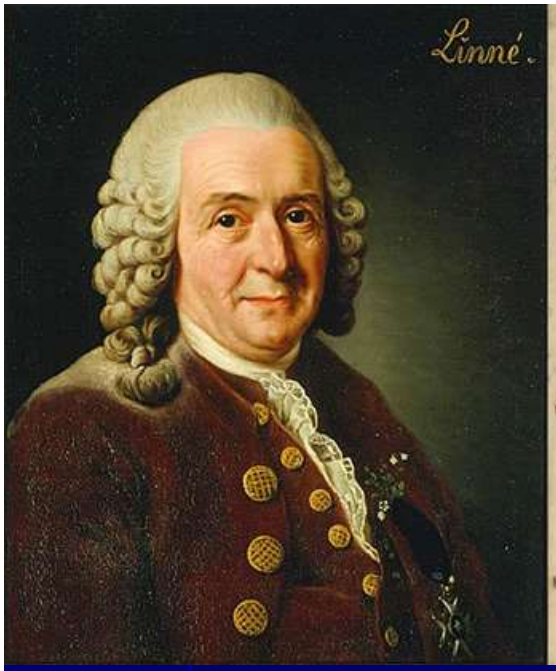
Scientifically proved link between vertebrates and invertebrates. He developed a unified theory of germinal layers for all the animal world.

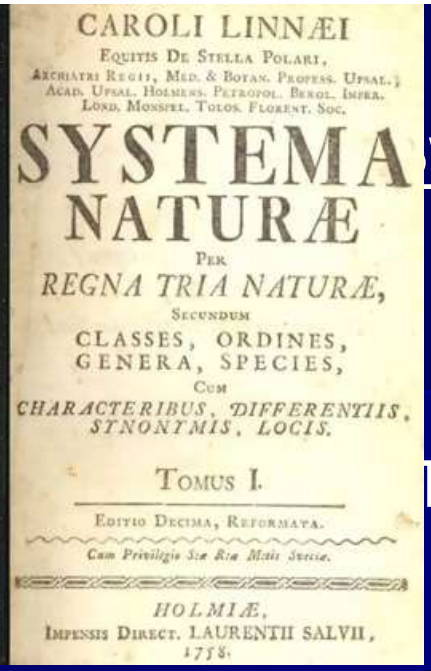
Biology and genetics

(from the Greek. bios - life, logos - teaching)

the totality of Life Sciences. (a term coined by Lamarck in the late 18th century.)

Becoming biology is closely related to the formation of the historical development of the organic world. Elements of this idea was appeared in the works of ancient Greek philosophers.




CAROLI LINNÆI
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ARCHIATRI REGII, MED. & BOTAN. PROFESS. UPSAL.;
ACAD. UPSAL. HOLMENS. PETROPOL. BEROL. IMPER.
LOND. MONSPEL. TOLOS. FLORENT. SOC.

SYSTEMA NATURÆ

PER
REGNA TRIA NATURÆ,
SECUNDUM
CLASSES, ORDINES,
GENERA, SPECIES,
CUM
CHARACTERIBUS, DIFFERENTIIS,
SYNONYMIS, LOCIS.

TOMUS I.

EDITIO DECIMA, REFORMATA.

Cum Privilegio Sæ Reæ Mtis Suecie.

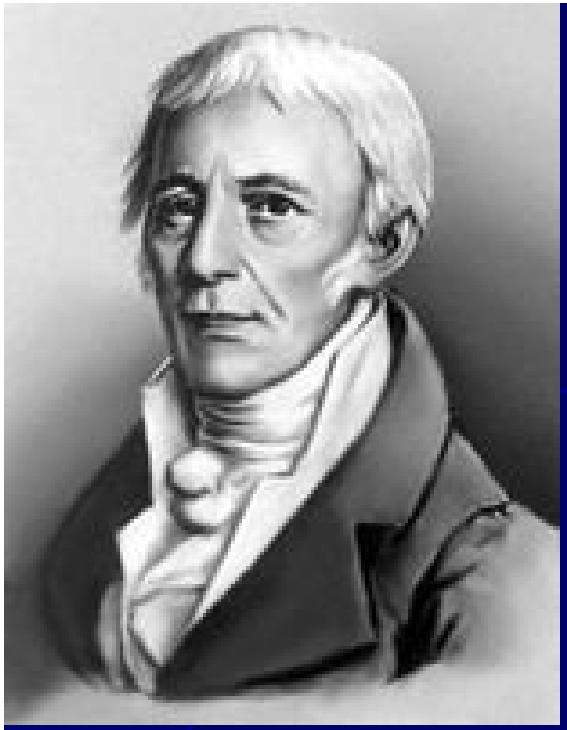
HOLMIÆ,
IMPENSIS DIRECT. LAURENTII SALVII,
1758.

Linnaeus was elected to the Academy of Sciences of Germany, Sweden, Great Britain, Russia and France.

Carl Linnaeus

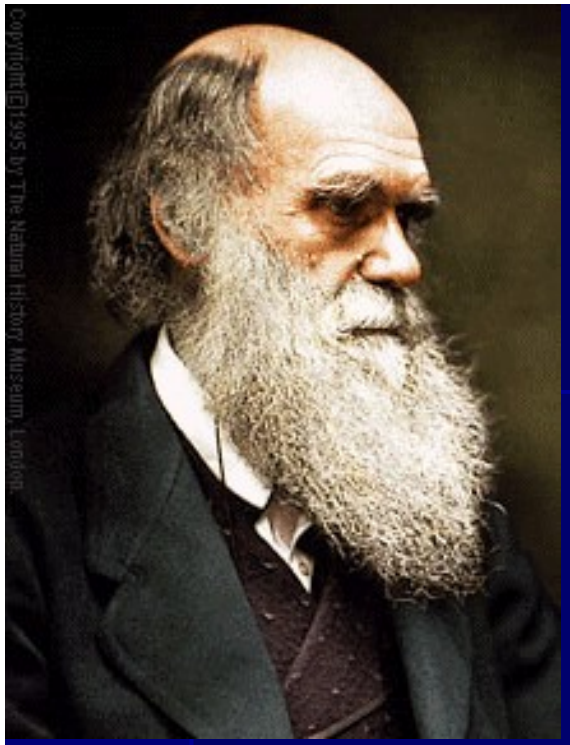
wedish physician and naturalist, laid down the systematics principles of organic world.

The system of nature "- the first time offered the basics of classification -" three kingdoms "(plants, animals and minerals). Each kingdom is divided into detachments, genera and species. For the first time the human is located into class of mammals (detachment of primates).



Jean-Batiste Lamarck - French naturalist, first formulated the theory of evolutionary development of living beings.

- He argued that between the species of animals are no sharp edges; species are not constant - they vary, acquiring new properties under the influence of the environment and inherit these attributes.
- He opposed the concept of preformation, arguing that "all living bodies originate from one another", but do not develop from the "pre-existing embryos."



Charles Darwin - the founder of the theory of evolution. 1859 - "The Origin of Species by Means of Natural Selection, or the preservation of selected species in the struggle for life." "Changing the domestic animals and cultural plants", "The Origin of Man and sexual selection" and others.

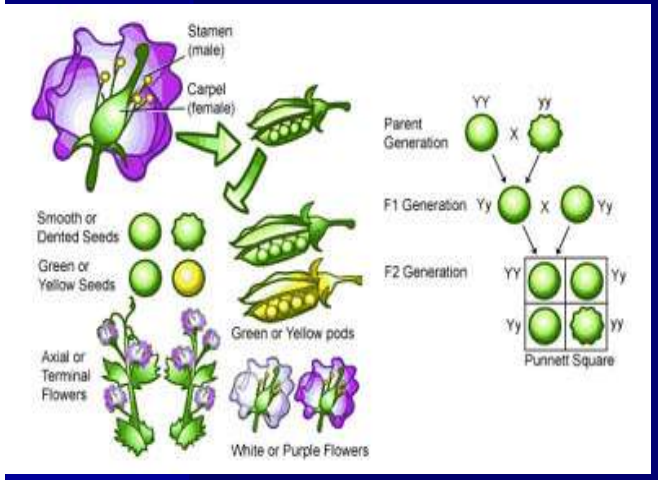
- He argues that there is in the world of animals and plants are descended from earlier common species as a result of evolution.
- The main factors of evolution he defined as variability, genetics and natural selection in a "struggle for existence."
- Charles Darwin was awarded an honorary doctorate at Cambridge, Bonn, Bresslavskogo and Leiden University, corresponding member of the Petersburg and Berlin Academies of Sciences.

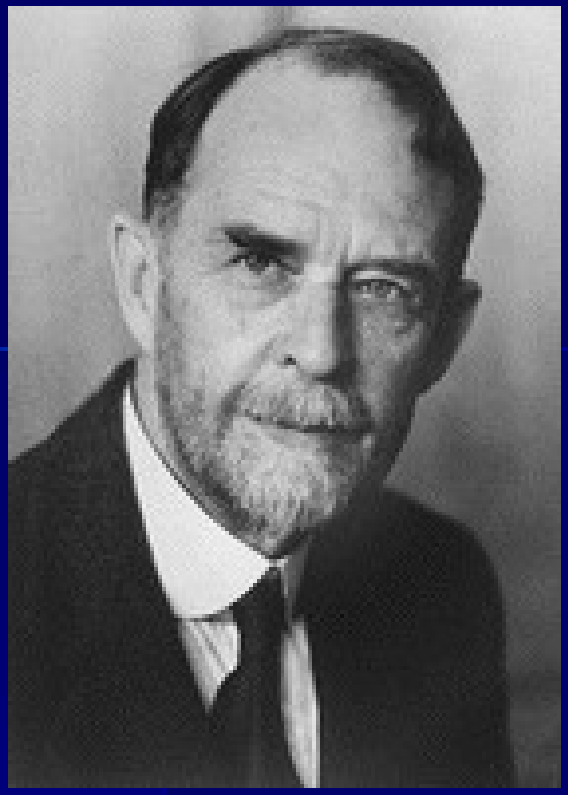
Gregor Mendel - Czech scientist, discovered the laws of heredity. The founder of genetics.

In experiments on the hybridization of two varieties of peas,he was found that organisms contain genetic factors that are transmitted to offspring when crossed, have a discrete nature and pass from generation to generation.

"Experiments on Plant Hybrids."

Mendel has outstripped the science of his time. His discovery did not receive adequate assessment and long remained in the shadows.





1911 - creation of the chromosomal theory of heredity by Thomas Morgan and his staff.

Since then, the leading theory of genetics has become a materialistic concept of the gene.

MICROBIOLOGY

(from the Greek. mikros - small)

the science about micro-organisms, their structure and activity, the changes they cause in humans, animals, plants and inanimate nature.

Emerged in the second half of the 19th century.

In the history of microbiology are two main periods:

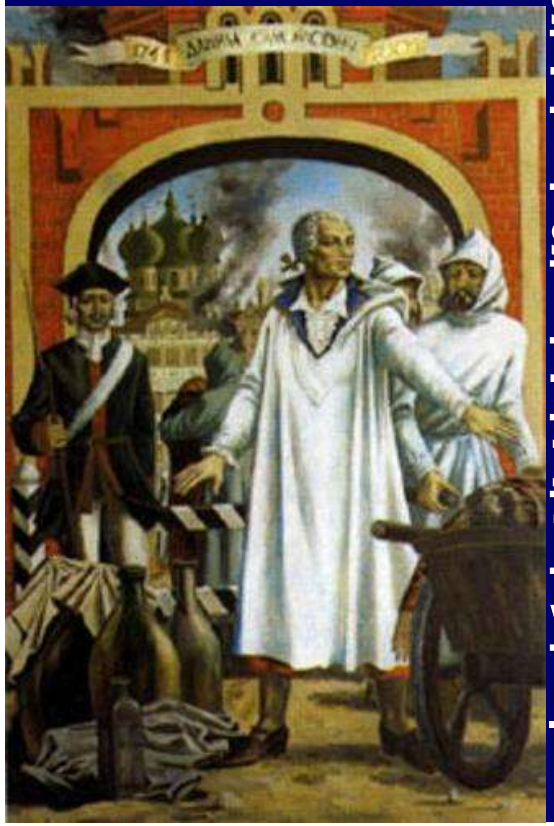
Empirical (until the second half of the 19th century.)

experimental, the beginning of which is associated with the activities of Louis Pasteur.

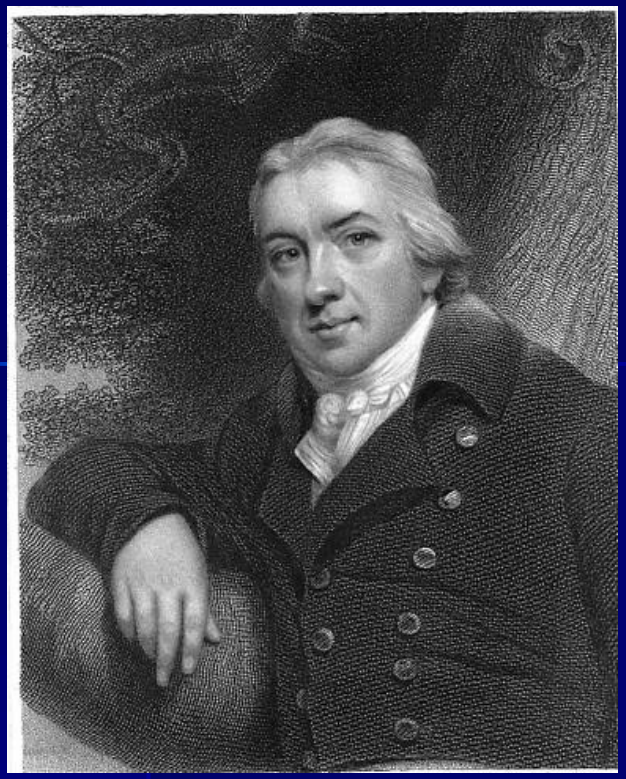
Lucretius, Pliny, Galen, Ibn Sina and others. - Empirical conjectures about wildlife, an infectious origin.

Girolamo Fracastoro
"On Contague, contagious diseases and treatment" - generalization of the saved information about epidemics of medieval Europe, ways of infection.

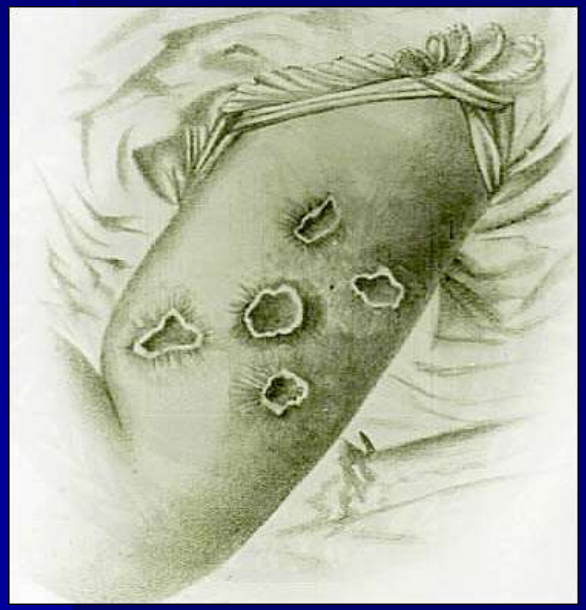
Levenguk - first found living microorganisms, and described them in his book "Secrets of Nature, open Anthony Levenguk."



D.S. Samoilovich, a Russian doctor first suggested the idea of the specificity of the plague.
He claimed that the plague is caused by " special being". He came to the idea of preventing the plague by introducing into the body weakened infective agents.
In 1803. Samoylovich injected himself infectious material taken from a person who recovered from the bubonic form of plague .



Edward Jenner, English physician, one of the founders of vaccination. For the first time used the vaccine against smallpox.



Jenner noticed that peasant women, who milking cows with cowpox, had bubbles resembling smallpox pustules on his hands . These peasant women never become ill with smallpox.

In 1796, conducted experiment by the method of vaccination (from. Lat. Vassa - cow): eight-year boy was vaccinated from pustules peasant hands infected with cowpox.

1.5 months later, Jenner did boy an injection in wich was contents of a patient with pustules smallpox - the boy was not ill. Repeated attempts to infect the boy with smallpox five months later not given any results - the boy have had immune to the disease. Repeating the experiment 23 times, in 1798, Jenner published an article entitled "Study of causes and effects cowpox."

Vaccination has been put into the British army and the navy, and in 1803 was organized by the Royal Society Dzhennerovskoe, which was headed by Jenner.

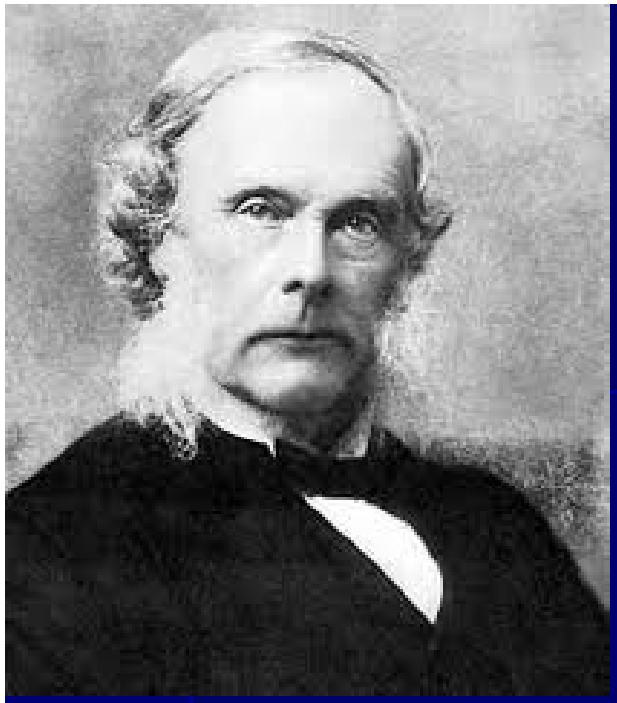
Antiseptic and aseptic

Ignaz Semmelweis - Hungarian physician, founder of antiseptics.

Working in obstetric clinic, has paid attention to the fact that in the same branch where trained students, the death rate from childbed fever reached 30%, and in another, where students were excluded, the mortality rate was low. He showed that the cause of this disease are the dirty hands of students who come to the maternity ward after the dissection of corpses.

The suggested method of protection - hand-washing with a solution chloride of lime and mortality decreased to 1-3%.

In Russia, handwashing by disinfecting solutions used in own practic I.V. Buyalsky and N.I. Pirogov, who have contributed to the development of antisepsis and asepsis.



Joseph Lister

Festering wounds linked to exposure and development of bacteria.

He gave a scientific explanation of surgical infection, to develop measures to combat it.

Apply 2-5% solution of carbolic acid for the treatment of objects that are in contact with the wound: the surgeon's hands, tools, bandaging material. Carbolic acid was sprayed in the air.

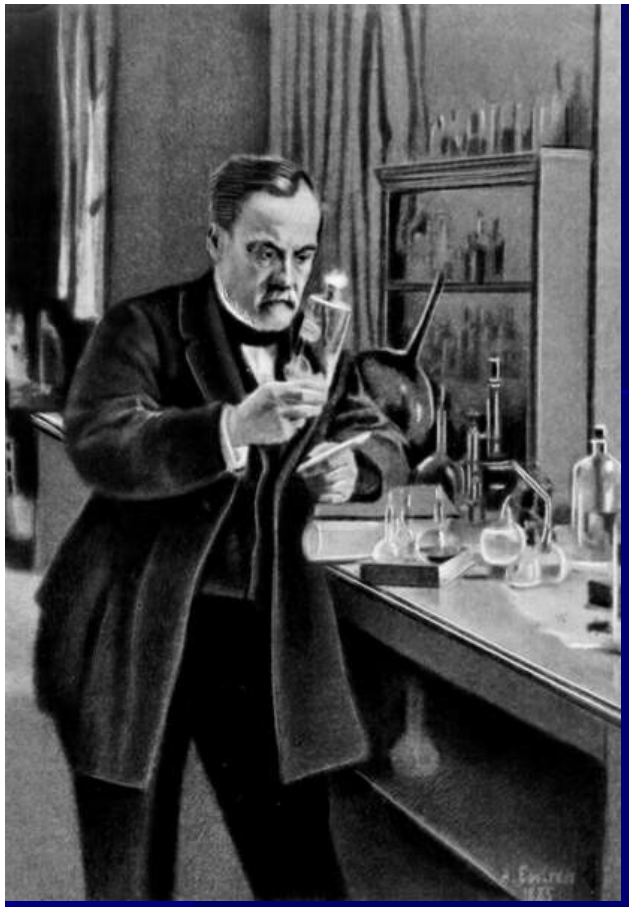
- He was elected an honorary member of many European scientific societies and was president of the Royal Society.

Immunology

Louis Pasteur, the eminent French scientist chemist and microbiologist, founder of scientific microbiology and immunology.

He showed that the process of fermentation and putrefaction associated with microorganisms.

- Key discoveries: the enzymatic nature of lactic acid, alcohol, and butyric fermentation, the study of diseases of wine and beer, a refutation of the hypothesis of spontaneous generation, the basics concepts of artificial immunity, creation of a vaccine against anthrax, rabies.



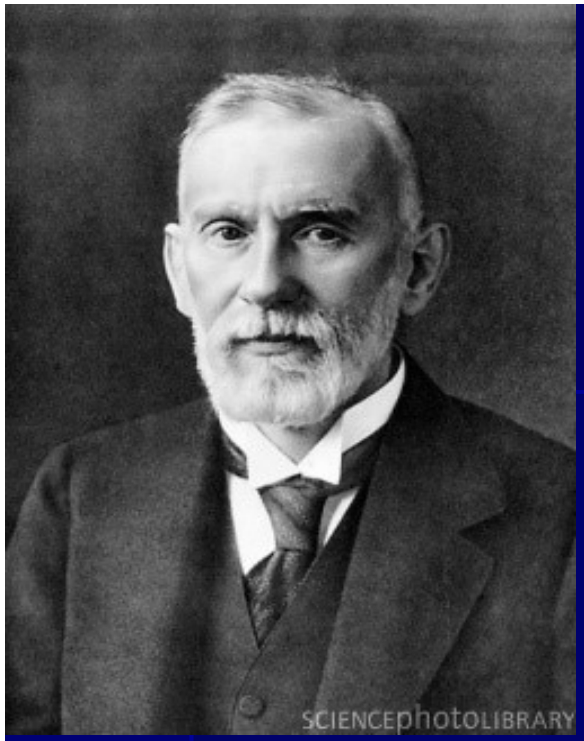
- In 1885 Pasteur has organized the world's first rabies station in Paris.
- In 1888. in Paris created a special institute for the fight against rabies and other infectious diseases. Pasteur was chief of Institute .
- Subsequently, the Pasteur Institute (as it was called at the suggestion of the French Academy of Sciences) has become the largest center of scientific thought in the field of microbiology.

Ilya Ilyich Mechnikov - famous Russian biologist, pathologist, immunologist and bacteriologist, creator of the phagocytic theory of immunity, one of the founders of evolutionary embryology.

He organized the first Russian station Pasteur anti-rabies and other infectious diseases.

He discovered that the mesodermal cells (white blood cells, spleen cells, bone marrow, et al., Which he called phagocytes) to act as the body's defense against pathogens.

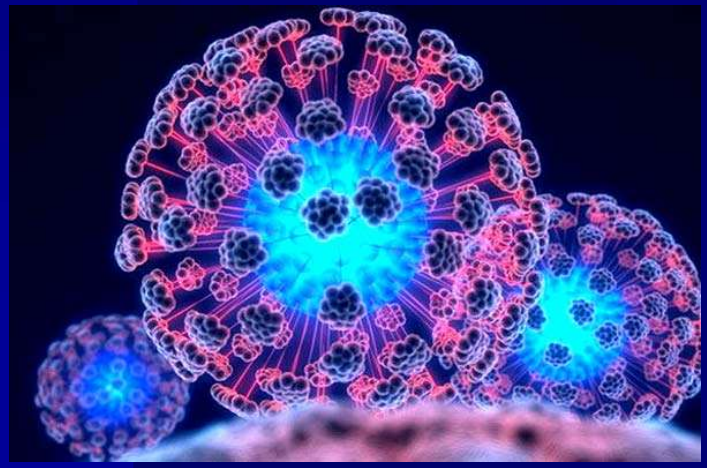
- On 7th Congress of Russian naturalists and physicians in Odessa in 1883. he made the first report on the phagocytic theory - "About protection powers of the body."



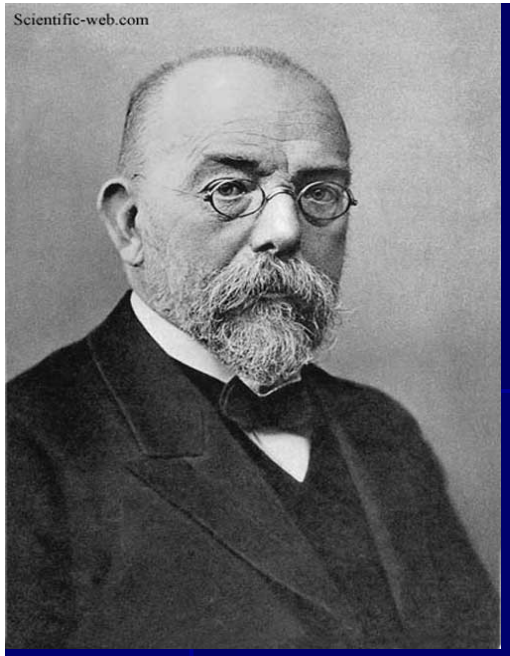
Paul Ehrlich - a German scientist, laid the foundation for the doctrine of the antibody as factors of humoral immunity.

I.I. Mechnikov and P. Ehrlich in 1908, were awarded the Nobel Award for the creation of the doctrine of immunity.

- G.N. Gabrichevsky, in 1892 began teaching microbiology at the University of Moscow, organized production of diphtheria serum in Moscow ;
- D.K. Zabolotny, founded Russia's first department of microbiology at the St. Petersburg Women's Medical University, made a great contribution to the study of the epidemiology of plague;
- N.F. Gamaleia engaged in the prevention of typhus, smallpox and plague.



Dmitri Ivanovsky Russian scientists discovered filterable viruses, laid the foundations of virology - a new direction in the microbiological sciences.



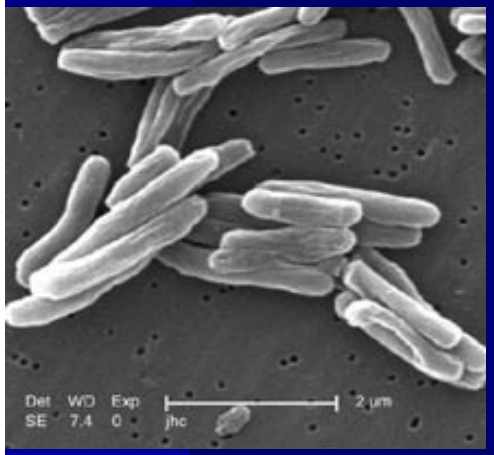
Robert Koch, a German scientist, the founder of bacteriology, the Nobel Prize winner.

He set the rules, which became known as the triad of Henle-Koch: in order to prove etiologic role of microorganisms in the event of the contagious disease should:

1) to detect the microbe in every case of the disease (and other diseases or healthy person it should not occur);

- 2) isolate it from the body of the patient in pure culture;
- 3) cause the same disease in an experimental animal infected his pure culture of this microbe.

The suggested method of growing pure bacterial cultures and studied the etiology of anthrax. Discovered Mycobacterium tuberculosis and cholera.



GENERAL PATHOLOGY

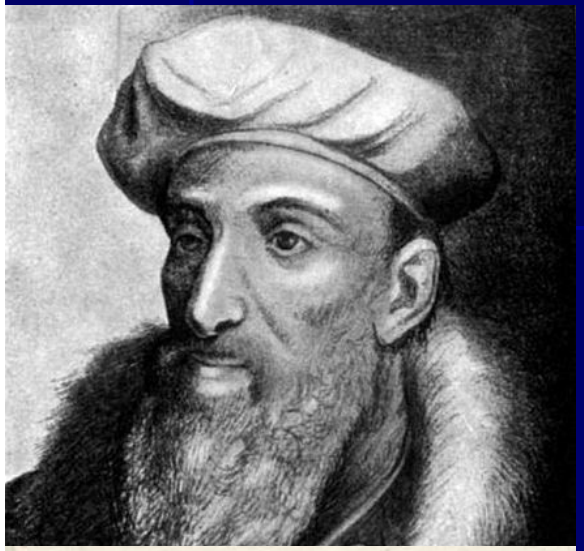
Pathological Anatomy (from the Greek. Pathos - disease) - the science that studies the structural basis of pathological processes - separated from the anatomy in the middle of the 18th century.

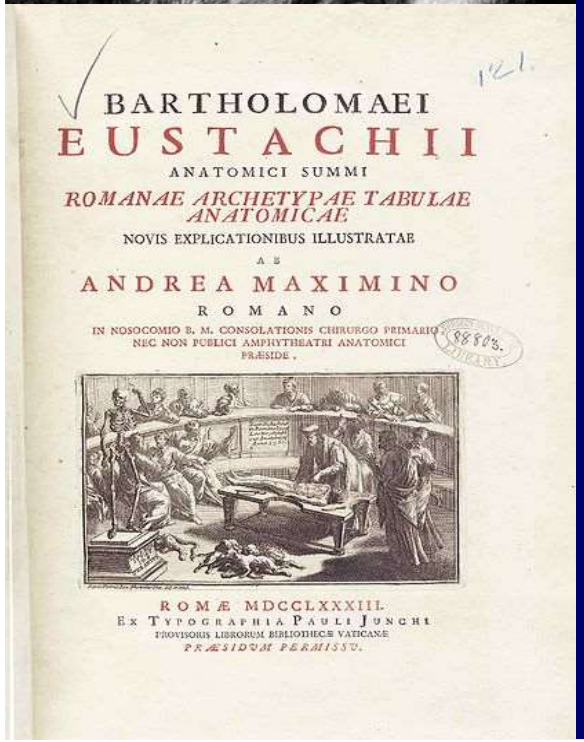
Its development in the new history is divided into two periods:

macroscopic (until the mid 19th century.)

microscopic.

The macroscopic period





- Bartolomeo Eustace first time in the second half of the 16th century. He introduced in the Roman hospital systematic dissection of the dead, and thus contributed to the formation of pathological anatomy.

Giovanni Battista Morgagni - Italian anatomist and physician, laid the foundation of pathological anatomy as a science.

He compares the change that he found in the autopsies of infected corpses with the symptoms of the disease, which he observed in the patient's life.

1761. "About location and causes of disease that are opened through the incision."

He laid the foundation of clinical and anatomical principles and created the first scientifically based classification of diseases.

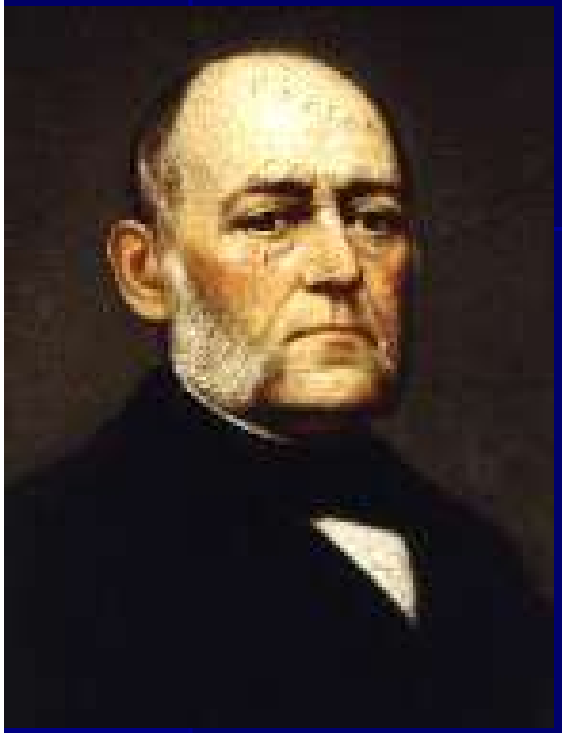
He was awarded diplomas of Academies of Sciences in Berlin, Paris, London and St. Petersburg.

Marie François Xavier Bichat - French anatomist, physiologist and physician.

For the first time showed that the livelihoods of individual organ composed of the functions of various tissues, in its composition, and that the process affects not the whole organ, but only some of its tissue (tissue pathology).

- Not using a microscopic technique, which at that time was still imperfect, Bisha laid the foundations of the doctrine of tissue - histology.

Microscopic PERIOD



Carl von Rokitansky

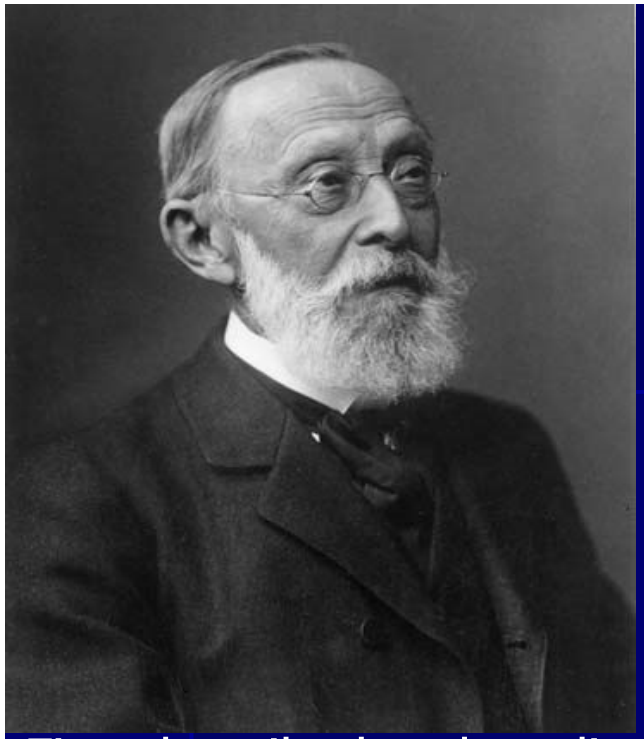
Viennese pathologist, a member of the Vienna and Paris Academy of Sciences.

In 1844. He created Europe's first department of pathological anatomy.

"Guidelines for the Pathological Anatomy" in 3 volumes, compiled on the basis of more than 20,000 autopsies produced using macroscopic and microscopic methods of investigation, three editions and was translated into English and Russian.

The main cause of illness he considered a violation of the composition of fluids (juice) of an organism - dyscrasia.

The local pathological process is considered as a manifestation of a general disease.



Rudolf Virchow

German physician and pathologist laid down the principles of morphological methods in pathology

He created the theory of cellular (cell) pathology "Cellular Pathology as a doctrine based on physiological and pathological histology."

Honorary member of the scientific societies and academies of almost all countries of the world.

First described and studied pathological anatomy of inflammation, leukocytosis, embolism, thrombosis, phlebitis, leukemia, renal amyloidosis, fatty degeneration, tubercular nature of lupus, glia cells.

Created terminology and classification of basic pathological conditions.
In 1847 he founded the scientific journal "Archives of pathological anatomy, physiology and clinical medicine", today published under the title "Archives Virchow."

In Russia, the beginning of the pathological anatomy and forensic autopsy was initiated in 1722., "Regulation" Peter I about hospitals. It requires the mandatory autopsy died a violent death. In 1835. "Articles of Association for hospitals" was compulsory autopsy patients wich dying in hospitals.

- A.I. Polunin - founder of Russia's first school of pathology in 1849. He headed the first department of pathological anatomy at the University of Moscow in Russia. For the first time gave a course of general and experimental pathology in Russia.
- M.N. Nikiforov - author of textbooks on pathological anatomy;
- N.I. Pirogov in 1840. introduced autopsies at the Medico-Surgical Academy;
- M. Rudnev - the founder of the St. Petersburg school of Pathologists.

In the middle of the 19th century in Russia formed an experimental pathology direction "pathological physiology."

Viktor Pashutin founder of the first national school of pathophysiology.

In 1874 he organized department of general and experimental pathology at the University of Kazan. In 1879. He headed the department of general and experimental pathology at the Military Medical Academy in St. Petersburg.

He introduced ideas of nervism in general pathology . Fundamental research on the metabolism (the doctrine of vitamin deficiency) and gas exchange (the study of hypoxia), digestion and the endocrine glands.

For the first time he presented pathological physiology as a "philosophy of medicine."

Manual "Lectures on general pathology (Pathological Physiology)" long remained basic textbook of pathological physiology.

Physiology and Experimental Medicine

(from the Greek. physis - nature and logos - teaching)

It is studying the vital functions of the whole organism, its parts, systems, organs and cells in a close relationship with nature.

History of physiology includes two periods:

empirical;

experimental: wich may be divided into two stages - before Pavlov and after

Empirical PERIOD

- The first presentation on the work of individual organs of the human body began to form in antiquity and contained in the writings of philosophers and physicians of the ancient East, ancient Greece and ancient Rome.

- In the Middle Ages, when the church was dominated by scholasticism, and cruelly persecuted attempts empirical knowledge of nature, in this period in the development of natural science was stagnated.
- In the Renaissance anatomical and physiological and natural science research, produced by A. Vesalius, George. Fabrice G. Fallopian G. Galilei, S. Santoro and others set the stage for future discoveries in the field of physiology.

The experimental period

William Harvey mathematically calculated and experimentally proved the theory of the circulation of blood.

Rene Descartes developed the concept of automatic animals , he spread the mechanistic principles of movement on the nervous system of animals.
Put forward the idea of the reflex as a reflection of the brain "animal spirits" that pass from one nerve to another. So was developed principle of the reflex arc in the simplest form. He tried to explain the operation of the human eye.

Альбрехт Галлер - швейцарский естествоиспытатель, врач и поэт.

Пытался уяснить сущность процесса дыхания в легких, установил три свойства мышечных волокон (упругость, сократимость и раздражимость), определил зависимость силы сокращения от величины стимула.

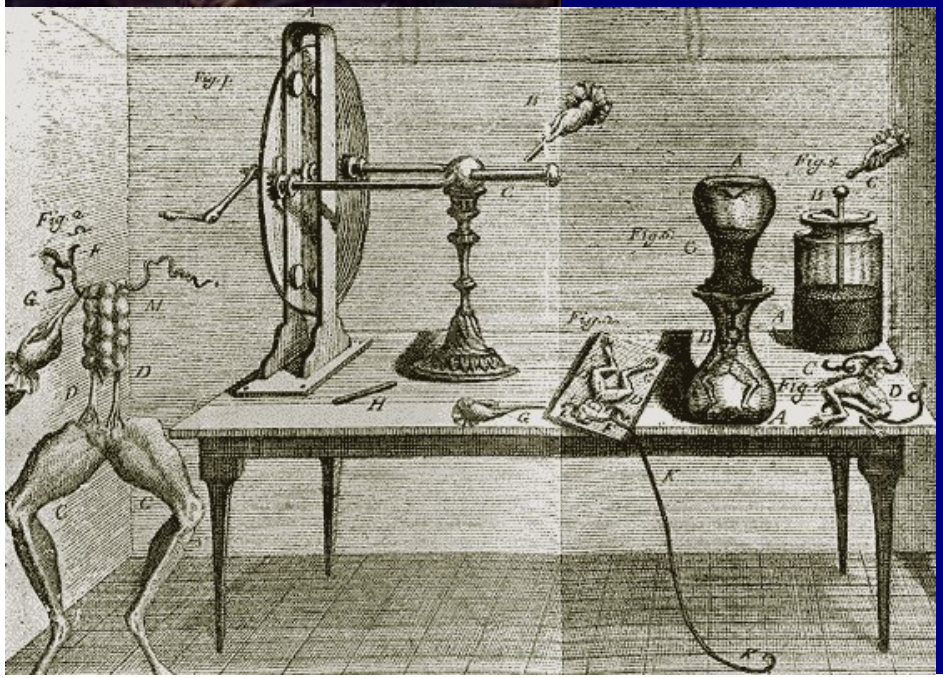
Первым заметил, что сердце сокращается непроизвольно под действием силы, которая находится в самом сердце.

Франсуа Мажанди французский физиолог.

Доказал раздельное существование чувствительных (задние корешки) и двигательных (передние корешки спинного мозга) нервных волокон.

Luigi Galvani Italian anatomist and physiologist.

Introduced the concept of bioelectric phenomena (the so-called "animal electricity"), which marked the beginning of electrophysiology.



Aleksei Matveevich Filomafitskiy founder of the Moscow school of physiology.

In 1833 he defended his doctoral dissertation "On the breath of birds."

One of the first promoters of the experimental method in the Russian Physiology and Medicine.

Together with the NI Pirogov developed a method of intravenous anesthesia;

He studied the problems of physiology of respiration, digestion, blood transfusion; He created devices for blood transfusions, mask of ether anesthesia and other physiological instruments.

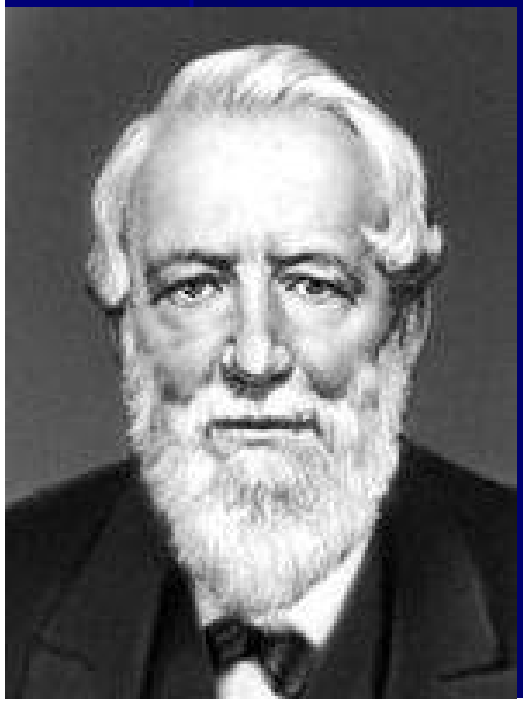
The author of the first Russian textbook "Physiology, published to guide his listeners."

Johannes Mueller - German naturalist, a member of the Prussian, corresponding member of the St. Petersburg Sciences Academy.

- To Him belong the fundamental research and discoveries in the field of physiology, pathological anatomy, embryology.
- In 1833. He formulated the basic provisions of the reflex theory, which were further developed in the works of Sechenov and Pavlov.

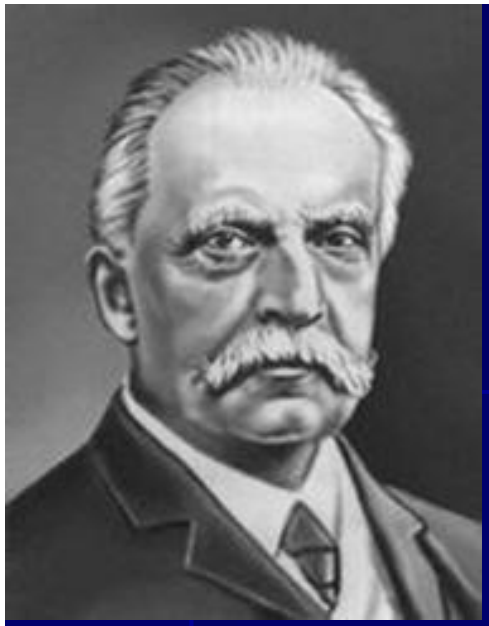
Karl Ludwig - German physiologist.

In his laboratory were invented kymograph and mercury manometer to record blood pressure, "blood clock" to measure the velocity of blood flow - plethysmograph, which determines the blood circulation of the limbs and other devices for physiological experiments.



Emil Du Bois-Reymond - German physiologist, founder of the Neuromuscular Physiology.

He developed new methods of electrophysiological experiments, discovered the laws and phenomena of electrotonus irritation - formulated molecular theory of biopotentials.

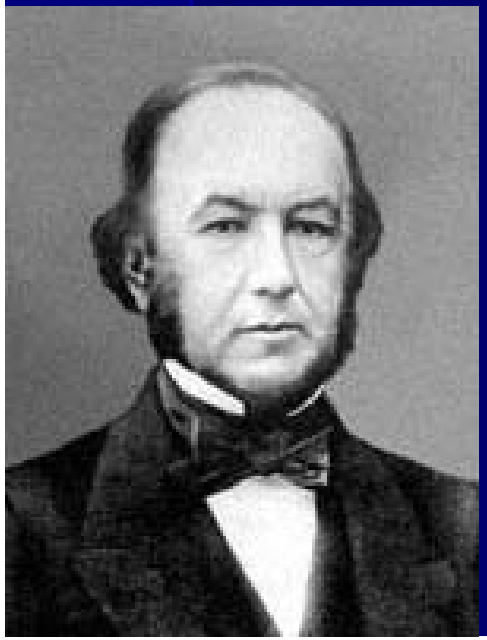


Hermann Helmholtz - German physicist, mathematician and physiologist.

He made great discoveries in the field of physiological acoustics and the physiology of vision.

To study the process of muscle contraction.

For the first time measured the velocity of excitation conduction along the nerve of a frog.



Claude Bernard - French physiologist.

He studied physiological mechanisms of secretion and the importance of digestive properties of saliva, gastric juice and pancreatic secretions.

He created the theory of the sugar diabetes.

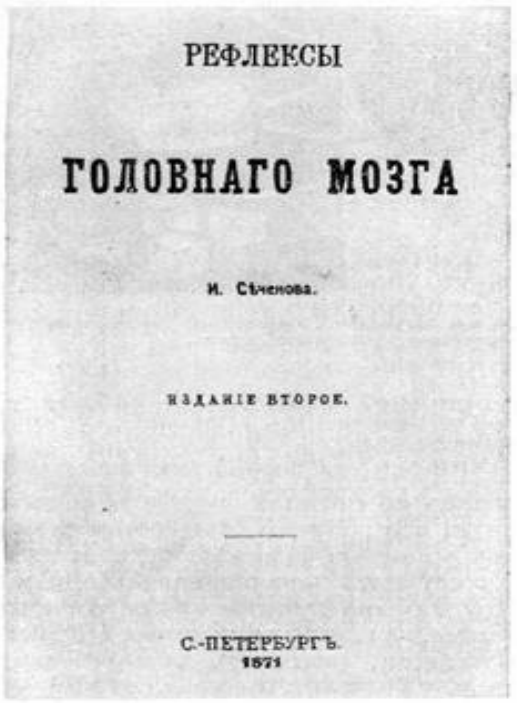
He studied of the nervous regulation of blood circulation.

He put forward the concept of the significance of constant internal environment (the basic teachings about homeostasis).

I.M. Sechenov - the great Russian scientist, an outstanding representative of the Russian physiological school, the founder of scientific psychology.

He has made an outstanding contribution to the development of the reflex theory, which is one of the basic theoretical concepts of physiology and medicine.

His work on the physiology of breathing and blood gas exchange, dissolution of gases in liquids and energy exchange laid the foundations of the future of aviation and space physiology.

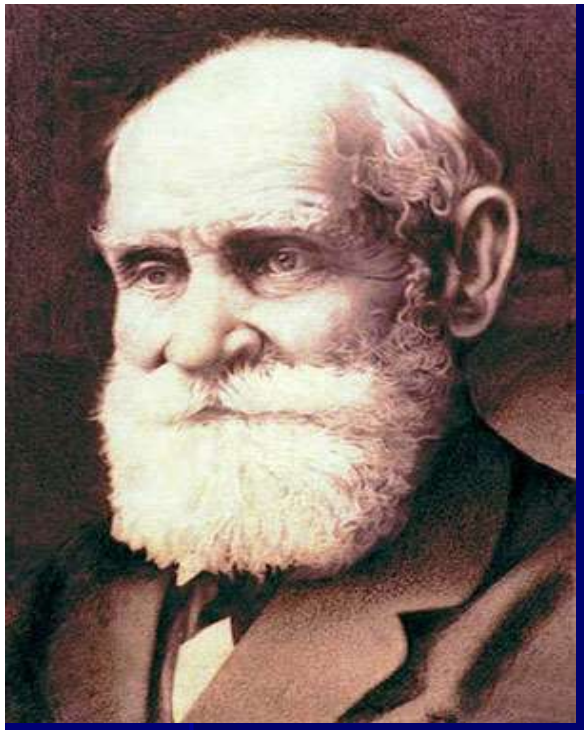


Of particular importance are the works of Sechenov on the physiology of the central nervous system and neuromuscular physiology.

- Put forward the idea about reflex-based mental activity and proved that "all acts of conscious and unconscious life by the process of origin are reflexes."
- In 1863, published article about the central (Sechenovskiy) braking for the first time demonstrated that, along with the process of excitation, there is another active process - sedation, which is essential integrative activity of the central nervous system. "Reflexes of the Brain."

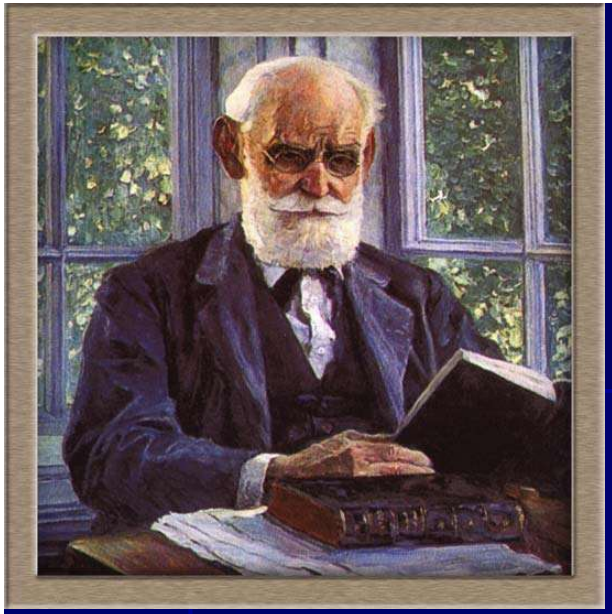
Nikolay Evgenevich Vvedensky - Sechenov's successor at the Department of Physiology, University of St. Petersburg.

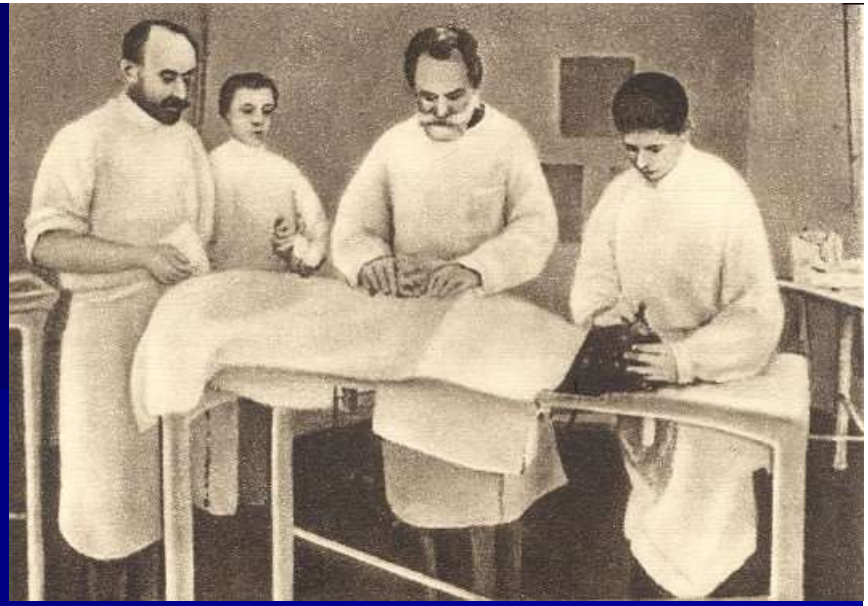
- He has made a significant contribution about physiology of excitable tissues and the nervous system in general.
- In 1887 he defended his doctoral thesis "On the relation between irritation and excitement from tetanus."
- Using the telephone for the first time heard the rhythmic excitement in the nerve.
- Introduced the concept of lability, he created the doctrine of parabiosis, contained in his monograph "The excitation, inhibition and anesthesia."



_Ivan Petrovich Pavlov - the great Russian scientist, the founder of the theory of higher nervous activity, the founder of the largest physiological school, pioneer methods of research in physiology.

In 1879 he graduated the Medical-Surgical Academy. S.P. Botkin was invited in the physiological laboratory at his clinic, where he directed by the pharmacological and physiological studies. In the laboratory, he wrote his doctoral thesis "The centrifugal nerves of the heart."
In 1890 he was elected professor of pharmacology, in 1895 - professor of physiology at the Military Medical Academy and the head of the physiological department at the Institute of Experimental Medicine in St. Petersburg.





- In 1904 Pavlov was awarded the Nobel Prize for Physiology and Medicine.
- He introduced the practice of physiological research method of chronic experiment, which made it possible to study holistic practically healthy animal.
- Pavlov identified the reflexes of a new type, which are formed and fixed under certain environmental conditions. He called them conditional, in contrast to the known inborn reflexes that are born in all animals of this type (unconditional).