CHEMICAL DISCOVERIES BY APOTHECARIES OF THE WESTERN EUROPE IN THE XVIII – XIX CENTURIES

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Introduction. Many chemical discoveries of the XVII-XIX century were made in the drugstores, which functioned as the well-equipped chemical laboratories. Apothecaries were considered to be highly educated specialists, combining the work of a pharmacist and a chemist. On the basis of drugstores, scientific centers and even the Academy of Sciences were created (Italy, France).

Aim. To analyze the historical facts of the development of the chemistry in pharmacies, as the centers of scientific research in Western Europe.

Materials and methods. Literary sources and biographies of outstanding chemist-pharmacists of the XVIII-XIX century, who entered their names in the history of chemistry.

Results and discussion. Apothecaries-scientists discovered new elements and substances, perfected technologies and methods of chemical processing, invented more exact equipment for their researches. In this period incentives for the development of chemistry and pharmacy were appeared.

Martin Heinrich Klaproth, the discoverer of three chemical elements: Zirconium, Uranium (1789), Titanium (1803), emerged from Germany's pharmacists. He also explained the phenomenon of polymorphism for the first time.

The main Emil Erlenmeyer`s studies are devoted to the theory of structure. He synthesized isobutyric acid and α-aminoacids, guanidine, determined the structure of alcohols and carboxylic acids, studied the regrouping of enols to aldehydes and ketones independently of Eltekov, and determined the structural formula of naphthalene. He introduced a conical flask (Erlenmeyer flask).

Karl Friedrich Mohr worked in a volumetric analysis of drugs, applying burettes, pipettes in the analysis for the first time and created a scales, which have named after him. English scientist Robert Boyle synthesized acetone by distillation of potassium acetate, obtained phosphoric acid and phosphine.

The period of the chemistry development was promoted by the French pharmacists. Louis Nicolas Vauquelin discovered Chromium, Beryllium, Palladium, Osmium. He published one of the world's first manuals on chemical analysis - "Introduction to Analytical Chemistry" and created a school of chemists. Antoine Jérôme Balard discovered a new element "murid" (1826), which later was renamed in Bromine by Gay-Lussac.

The main scientific works of Pierre Jean Robiquet are devoted to the analysis of organic compounds, he discovered the first aminoacid asparagine (1806), pectin and malic acid, extracted camphor and quinic acid. The manager of the hospital drugstore, Joseph Louis Proust, investigated "honey sugar" and established its difference from "cane sugar". Also, his works about urea, enzymes, gluten are widely known. The military pharmacist Barnard Courtois discovered Iodine.

Jean Baptiste André Dumas is one of the authors of the theory of eaterine. He proposed a volumetric method for the quantitative determination of nitrogen (1830) in organic compounds (Dumas method), established the existence of the first homologous series in organic chemistry – a series of formic acid (1843).

The main studies of Georges-Simon Serullas are devoted to nitrogen-containing and organic halogen derivatives. He opened iodoform by the action of potassium on an alcohol solution of iodine, cyanamide (1827), cyanuric chloride (1827), iodide of nitrogen (1829), cyanuric acid, and (1824) methylene iodide, synthesized ethyl bromide (1827), the first organic bromine compound.

French chemist, pharmacist and technologist Antoine Bome was the author of a number of manuals on chemistry and pharmacy, including "Elements of theoretical and practical pharmacy" (1762) and "Experimental and theoretical chemistry" (1773), which details the chemistry of the late 18th century from the positions of the phlogiston theory

Pierre Eugène Marcellin Berthelot was a chemist and public figure, professor of chemistry at the Higher Pharmaceutical School in Paris (1859). He is an author of numerous works in organic chemistry, thermochemistry, agrochemistry, history of chemistry. He synthesized a huge number of organic compounds belonging to different classes, than he caused a final defeat to the ideas of "life force". He proved the possibility of synthesis of glycerin and fatty acids received (1853-1854) analogues of natural fats by their interaction. In addition, he found, that glycerin is a tritical alcohol. In 1851 he began working on the synthesis of organic compounds from simple substances, synthesized the simplest hydrocarbons - methane, ethylene, acetylene, benzene, and then based on them - more complex compounds. Of fundamental importance was the synthesis of ethyl alcohol by the hydration of ethylene in the presence of sulfuric acid (1854), before this ethyl alcohol was obtained only by fermentation of sugary.

Conclusions. In many bibliographic sources, the period of the XVII and the first half of the XIX century is called the "golden age of pharmacy". At that time, chemists opened new chemical compounds, while creating new drugs, and outstanding chemists, although they considered chemistry an independent science, combined their chemical research with pharmacy practice.