## 200. birthday of

# Ludwig Traube

## (12th January 1818 - 11th April 1876)

by
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**fig. 1: Ludwig Traube**

**Curriculum vitae**

Ludwig Traube (fig. 1) was born 1818 as the son of a silesian winedealer. After secondary school exams in Ratibor (Silesia) 1835 he studied in Breslau and Berlin and stayed a close friend of his fellow students Robert Remak (1815-1865), Arnold Mendelssohn (1817-1854), Emil du Bois Reymond (1818-1896), Salomon Neumann (1819-1918), Benno Reinhard (1819-1852), Joseph Meyer (1818-1887), Rudolf Leubuscher (1821-1861) and Rudolf Virchow (1821-1902). Because of restrictions in clinical teaching for civil students in the (at that time: predominantly military) hospital Charité in Berlin the group studied French journals in private rooms, especially of the Paris school of Medicine (manuscripts of François Magendie, René Théophile Hyacinthe Laënnec, Xavier Bichat, Achille Longet and Claude Bernard).

Following theoretical studies they started with experiments on vagus lesions and developed a model of aspiration pneumoniaTraube founded the "Hospital of Propaedeutics" in Berlin, although its inclusion in the 2nd Medical clinic in the Charité Hospital was successful years later only and under the direction of Ernst von Leyden. It is not well known that Ludwig Traube was a cofounder of experimental pathology together with Rudolf Virchow and the first and for more than 70 years singular jewish director in the Charité hospital in Berlin. He married his wife Cora Marckwaldt in 1850 and had 5 children, their oldest sun died in the age of 5 on diphtheria. Traube refused from calls to Zurich and Heidelberg. Ludwig Traube died 1876 and was buried at the jewish cemetery in Berlin, Schönhauser Allee (fig. 2). The Charité hospital honoured his work with a bronze bust in 1895 left-sided to the entrance of the 2$^{nd}$ Medical clinic. It was removed at the night from Saturday 27$^{th}$ to Sunday 28$^{th}$ July, 1940 together with the busts of further jewish professors Eduard Heinrich Henoch (1820-1910), Otto Lubarsch (1860-1933) and Carl Friedrich Otto Westphal (1833-1890) in the Charité campus on antisemitic reasons after a letter of complaint of Georg Bessau (1884-1944), director of the Pediatric clinic, sended to the administration manager of the Charité hospital. Traubes bust, created by Martin Wolff (1852-1919) and ceremoniously elected 1895 is missed since 1942. The Mexican painter Diego Rivera (1886-1957) included the face of Ludwig Traube in his painting "History of Cardiology II" in the Cardiologic Institute of Mexico (fig. 3).

## Scientific work

After a 9month visit in Vienna in the institutes of Joseph von Skoda (1805-1881) and Carl von Rokitansky (1804-1878) he returned to Berlin, where he investigated the effect of digitalis and observed changes in blood pressure, described later as “Traube-Hering-waves” and explained as a result of vagal nerve stimulation. In addition he described the “Traube´s double tone” on peripheral arteries in aortic regurgitation 1867 (14), the “pulsus alternans” in digitalis intoxication 1872 and “Traube-Hering-Mayer waves” of changes in blood pressure. He developed a mechanical stethoscope (fig. 4). Ludwig Traube published the auricular gallop in right heart failure, the so called as “Traube bruit” (15) and the “Traube space” of tympanitic sound in left-sided pleural effusion. He published several manuscripts and chapters on pulmonary, renal and cardiac diseases (fig. 5). Traube founded together with Benno Reinhardt and Rudolf Virchow the journal *Beiträge zur experimentellen Pathologie und Physiologie* 1846 and published in the first issue: “Experiments have their basis on hypothesises, should offer significant results and should be reproducible”. The first temperature curves for patients were proposed by him. He had several scientifically well-known students and friends: Theodor Billroth (1829-1894), Albrecht von Graefe (1828-1885), Richard von Volkmann (1830-1889) and Ernst von Leyden (1832-1910). Several of Ludwig Traube´s contributions to the clinical investigation of patients with heart diseases are actual in clinical investigation up to our days. He described different types of insiratoric dyspnea (“Traube´s dyspnea”), “Traube´s cork” in bronchiectases and dysmorphic hypochrome erythrocytes (“Traube´s corpuscula”). He is one of the founders of cardiology, who is honoured by several contributions in journals (fig. 6).

**Selected Publications of Ludwig Traube**

- *Die Ursachen und die Beschaffenheit derjenigen Veränderungen, welche das Lungenparenchym nach Durchschneidung der Nn. vagi erleidet.* In: *Beiträge zur experimentellen Pathologie und Physiologie.* Band 1, (Berlin) 1846, S. 65–200.

- *Beitrag zur Lehre von den Erstickungserscheinungen am Respirationsapparat. Beiträge zur experimentellen Pathologie*. 1846 and 1847.

- *Ueber periodische Thätigkeits-Aeusserungen des vasomotorischen und Hemmungs-Nervencentrum*. In: *Centralblatt für die Medicinischen Wissenschaften*. Berlin, 1865, 3: 881–885.

- *Die Symptome der Krankheiten des Respirations und Circulations-Apparats. Vorlesungen gehalten an der Friedrich-Wilhelm-Universität zu Berlin*. Hirschwald, Berlin 1867.

- *Gesammelte Beiträge zur Pathologie und Physiologie*. Hirschwald, Berlin 1871–1878.

- *Ein Fall von Pulsus bigeminus nebst Bemerkungen über die Leberschwellungen bei Klappenfehlern und über acute Leberatrophie*. In: *Berliner Klinische Wochenschrift*, 1872, 9: 185–188, 221–224.


**fig. 2: Gravestone of Ludwig Traube,**

**jewish cemetery, Berlin, Schönhauser Allee**

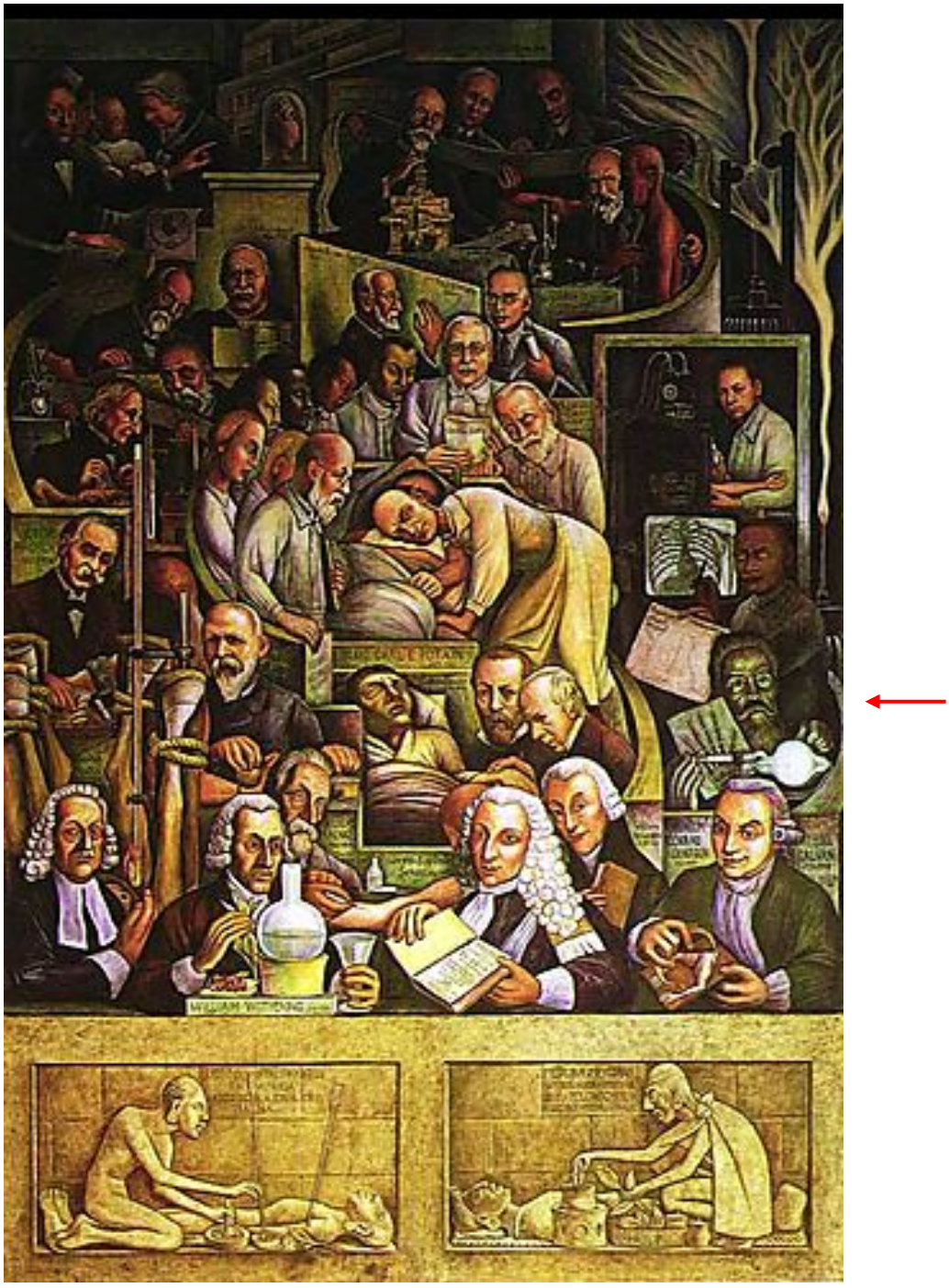


**fig. 3: Diego Rivera: Historia cardiologiae II**

**Cardiologic Institute, Mexico**

(Ludwig Traube is marked by two arrows)

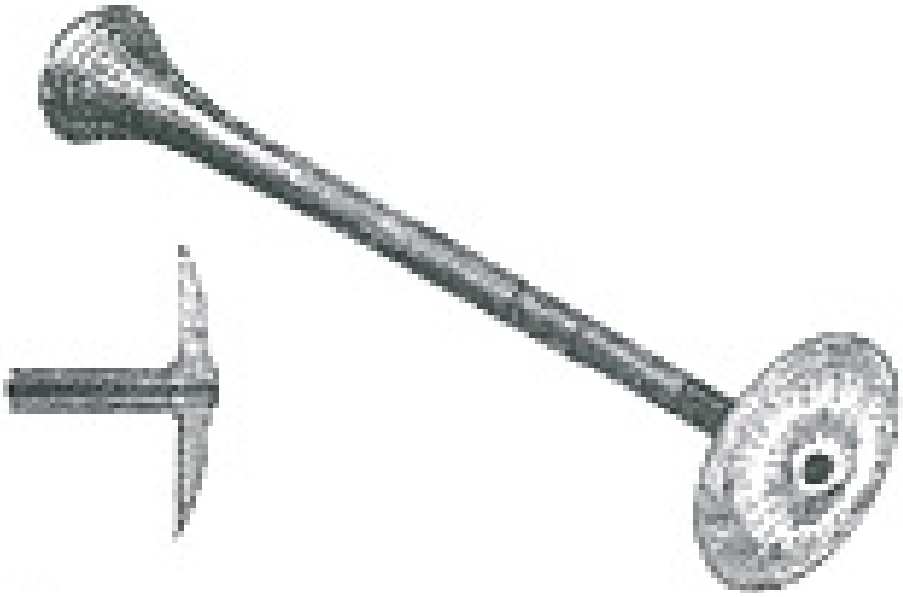
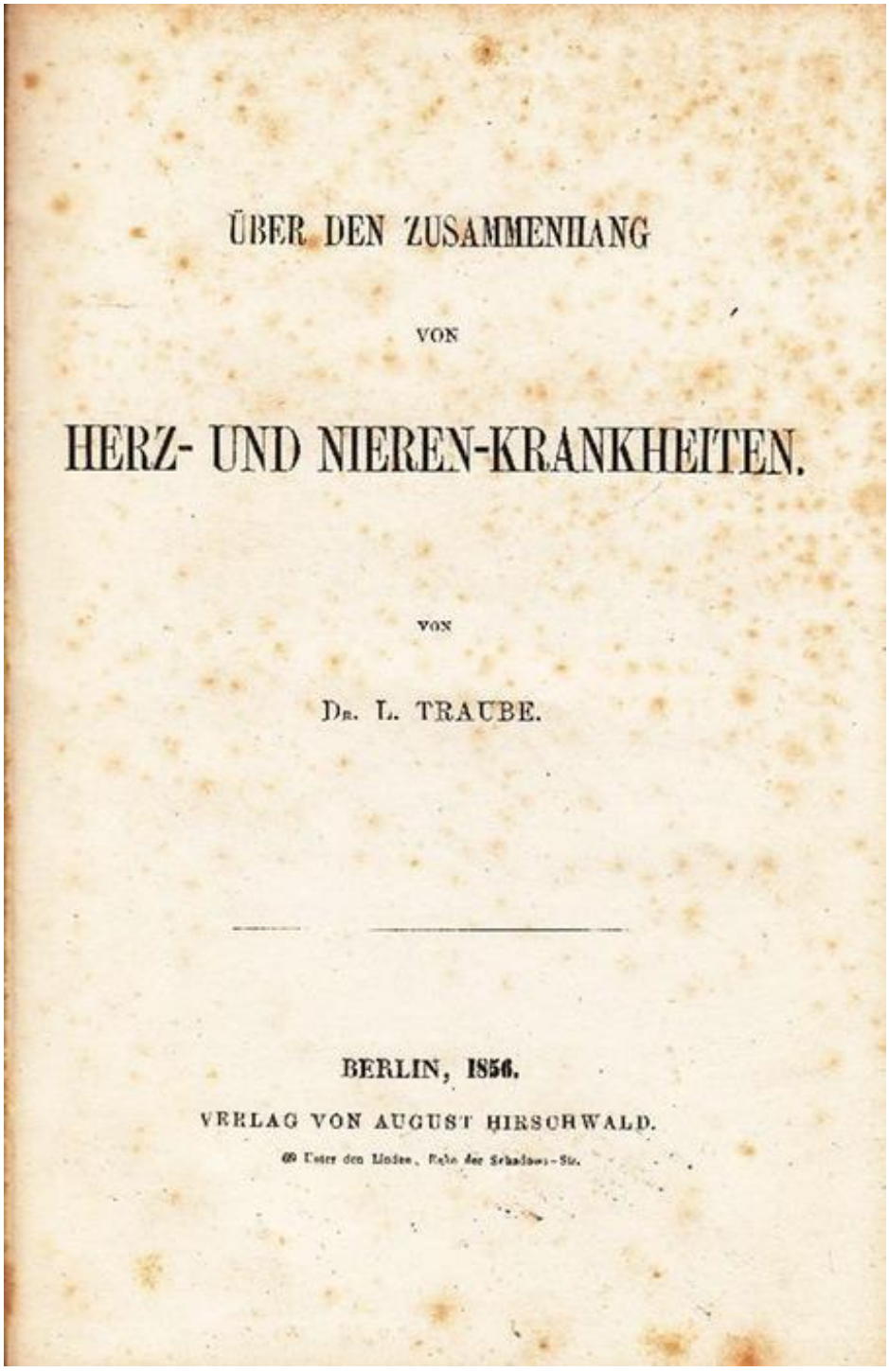


**fig. 4: Stethoscope, developed by Ludwig Traube**



ÜBER DEN ZUSAMMENHANG

VON

HERZ- UND NIEREN-KRANKHEITEN.

VON

DR. L. TRAUBE.

BERLIN, 1856.

VERLAG VON AUGUST HIRSCHWALD.

**fig. 5: Connections between heart and renal diseases**

**Berlin 1856**

# LUDWIG TRAUBE*

BY HYMAN MORRISON, M.D.

THE half century mark after the death of Ludwig Traube (b. 1818—d. 1876) gives a fitting occasion to recall the role he played in the development of internal medicine to its present scientific status. His service to medicine was several fold. At the beginning of his career, a little before the middle of the last century, he was the moving spirit in a group of young German physicians, among others Henle, Wunderlich, Helmholz, and Virchow, all pupils of Johannes Müller, who had set themselves to raise the medicine of their country out of its

LUDWIG TRAUBE

state of barrenness. The period of remarkable medical progress that followed speaks well for this common effort. Besides this, Traube had to fight his own battle as a Jew. In spite of all obstacles he reached the height of the foremost clinician of his day and became a teacher of rare ability, through whose efforts the methods and influence of Auenbrugger and Laennec were introduced into Germany. His greatest contribution, however, the one which will perpetuate his memory, is his introduction of the method of physiological experimentation in pathology and clinical medicine. For this he has been named the founder of experimental pathology in Germany.

At the time Traube entered upon his medical career in 1835 Paris was the great medical centre. The famous pathologico-anatomical school of French clinicians, of which Laennec and Louis were the outstanding figures, had revolutionized clinical medicine by the use of percussion and auscultation and by their correlation of clinical and anatomical investigation. Their scientific spirit spread quickly to many parts of the world and new centres of medical learning arose in Ireland, England, Vienna and America.

*Read at a meeting of the Boston Medical History Club, March 25, 1927.

## HIS MEDICAL TRAINING

Germany alone was not stirred by this new spirit. The state of lethargy in that country under the prevailing sway of speculative philosophy may be estimated from Traube's experiences during his medical schooling in Breslau and Berlin between 1835-40. The only outstanding men in the two faculties who attracted him and inspired him to scientific work were the physiologists, Purkingje and Johannes Müller. The clinical courses were so backward that he neglected them entirely, though he had early in his youth determined to be a practicing physician, and turned rather to the study of Spinoza and Bacon. At one time he became so discouraged and depressed over the situation that he was about to quit medicine, and returned to his studies only on the insistence of his father, who promised, on his part, the means for a longer course of study in science. The condition of the clinics in Berlin were so bad, however, that he had to get instruction from books, and turned with avidity to the works of the French, especially Laennec and Magendie. Although he received his degree in 1840, it was only in 1839 when Schoenlein came to Berlin that there was any effort at all to introduce Laennec's diagnostic methods in Germany. He received his first actual instruction in the newer methods of physical examination in Vienna, where he went to complete his studies. There, under the influence of Skoda and Rokitansky, he first developed an enthusiasm for medicine and he devoted himself to his studies night and day. After passing his state examination he returned to Vienna for further study, even though he had to sell some of his own and his brother's books and clothing to get there.

On his return to Berlin, though he had to set out in practice, his mind was clear as to the program for the future. He was determined to devote himself to scientific research, hoping to get a moderate sustenance by utilizing his Vienna acquirements in teaching. He encountered difficulties from the very first; the Charité was the only public hospital in Berlin, and it was exclusively in the hands of the military surgeons. Undaunted, he associated himself as assistant to an army physician in one of the suburbs and utilized this position for clinical study,

**fig. 6: Manuscript on life and scientific impact of Ludwig Traube**