

## Medicine in Stamps

### René Laennec (1781-1826): inventor of the stethoscope

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Prior to the invention of the stethoscope, listening to the heart or lungs meant placing one's ear directly upon the patient's chest, a procedure known as "direct auscultation". In 1761, Leopold Auenbrugger introduced the art of percussion as a new method of clinical examination. While this expanded the physician's diagnostic reach, it went largely unnoticed until Jean Nicolas Corvisart translated it from Latin to French in 1808. A significant breakthrough came in 1816 when a young French physician named René Laennec invented a bedside listening device capable of amplifying the sounds of the heart and lungs. This novel instrument, called the stethoscope (from the Greek words *stethos* meaning "chest" and *skopos* meaning "observer"), would eventually become every physician's essential diagnostic tool and the profession's venerable status symbol.

René Théophile Hyacinthe Laennec was born in February 1781 in the Breton town of Quimper in Southern Brittany, France. His father was a lawyer who loved poetry but knew little about bringing up children. Thus at the age of five years, when young Laennec's mother died, he was forced to move in with an uncle, Dr Guillaume Francois Laennec, Dean of the Medical Faculty at the University of Nantes. Laennec's uncle had a great influence on him. By the age of 14 years, Laennec was already helping out at the Hotel Dieu, a prominent French hospital.

By 1799, he was serving in the Military Hospital in Nantes where he learned blood-letting, the dressing of wounds and minor surgery. Laennec also became proficient in Latin and Greek, fueled by his desire to read Hippocrates in its original language. To further his studies, Laennec moved to Paris and trained under France's foremost teacher, Jean Nicolas Corvisart,

at La Charité Hospital. Laennec's name would become associated with alcoholic cirrhosis of the liver. He would also be known for his published papers on peritonitis, venereal diseases, and mitral valve stenosis. However, his greatest contribution to medicine was undoubtedly the invention of the stethoscope.

**In Search of a Solution:** In 1816, he began his professional career at Necker Hospital, a 20-bed institution in Paris. One day, he encountered a young obese female patient whom he attempted to examine, but he could not place his ear upon her chest without violating social and cultural norms (*"It is always inconvenient both to the physician and patient; in the case of females it is not only indelicate but often impracticable; and in that class of persons found in hospitals it is disgusting"*).

Recalling that sound was augmented when traversing solid bodies, Laennec thereupon rolled up a piece of paper into a cylinder and applied one end to the region of the heart and the other to his ear. *Et voila!* He had invented the stethoscope. To his immense surprise and pleasure, he was able to perceive the patient's heart sounds ever so loudly and distinctly. He

termed this indirect manner of listening to the chest "mediate auscultation", and his findings were subsequently recorded in his book, *De l'Auscultation Médiante*.

Laennec experimented with instruments of various materials, lengths and shapes, and described his invention in this way: *"I shall now describe the instrument I use at present, and which has appeared to me preferable to all others. It consists simply of a cylinder of wood, perforated in its center longitudinally, by a bore three lines in diameter, and formed so as to come apart in the middle, for the benefit of being more easily carried. One extremity of the cylinder is hollowed out into the form of a funnel to the depth of an inch and a half, which*



cavity can be so obliterated at pleasure by a piece of wood so constructed as to fit it exactly, with the exception of the central bore which is continued through it, so as to render the instrument in all cases, a pervious tube. The complete instrument, that is, with the funnel-shaped plug infixed – is used in exploring the signs obtained through the medium of the voice and the action of the heart; the other modification, or with the stopper removed, is for examining the sounds communicated by respiration. This instrument I commonly designate simply the Cylinder, sometimes the Stethoscope.”

Skepticism initially greeted Laennec’s invention and his stethoscope became the butt of numerous jokes in France. The English took to his tool more kindly, but even they doubted the staying power of the stethoscope and regarded it as a passing fad. But history would prove them wrong. Subsequently modified by a New York physician (Dr George Philip Cammann) with the addition of two flexible rubber tubings so that both ears could listen in, Laennec’s “cylinder” has stood the test of time, providing generations of physicians a window to see into the chest cavity. Laennec eventually won many academic titles and students flocked to Paris to learn from him. He was subsequently made a Knight of the Legion of Honor.

**Rales and Rhonchi:** At Necker Hospital, Laennec used his new instrument to correlate bedside findings with autopsy results in patients with chest ailments. He came up with a whole new nomenclature for auscultation. He first described two variations of normal breath sounds: pulmonary/vesicular and bronchial, and then went on to describe adventitious sounds. He described these added sounds as *râles* or rattles. However, he was concerned that this term might frighten his patients due to the association of the word “rattle” with the term “death rattle.” He therefore used the Latin word *rhonchus* when describing adventitious breath sounds. Thus for Laennec, the French term *râle* and the Latin term *rhonchus* had similar meanings.

Using the crude instrument that he invented, Laennec was able to describe five different types of *râles*, namely:

1. *Râle humide ou crépitation* (crepitant), described as “the sound of salt crackling when roasted in an evaporation dish.”
2. *Râle muqueux ou gargouillement* (gurgling), described as the death rattle.
3. *Râle sec sonore ou ronflement* (snoring or sonorous).
4. *Râle sibilant sec ou sifflement* (whistling or hissing or sibilous).
5. *Râle crépitant sec à grosse bulles ou craquement* (crackling), described as the sound on blowing up a dried bladder.

Laennec also observed that on occasion when the cylinder/stethoscope was applied to the chest, the patient’s voice sounded clearer and seemed to come directly from the chest. This correlated with lung cavitation, and he termed this finding pectoriloquism, literally meaning speech from the chest. He described pleural friction as *bruit de cuir neuf* – the creaking of new leather, and also described the sound heard above a pleural effusion as *aegophony*.

**An Ironic Death at 45:** Laennec’s mother died of tuberculosis, and Laennec himself was thought to be asthmatic. During exacerbations of his respiratory symptoms, he would steal to the countryside of Brittany for its rejuvenating fresh air. All of five foot three inches, the diminutive physician married late, just two years before his untimely death at the age of 45 years. He had no children, his wife having suffered a miscarriage. As Laennec’s health deteriorated and he grew progressively weak, he continued to deny that his physical condition could be due to “consumption,” the name popularly used to describe phthisis or tuberculosis.

By June 1826, the fever, productive cough and shortness of breath were unrelenting, and he made the last foray to his beloved countryside of Brittany. There, he asked his nephew Mériadec to auscultate his chest and to describe what was heard. The auscultatory findings were as alarming as they were familiar to this greatest of chest physicians who had heard the same sounds a thousand times before. By his own invention, he could no longer escape the ironic truth that he was dying from cavitating tuberculosis. As the end approached, he removed the rings from his fingers, and responded to his wife’s puzzled look with these dying words: “*Someone would soon have to render me this service. I wish to spare them the painful task.*” In his will, René Laennec bequeathed to Mériadec all of his scientific papers, as well as his watch and ring “*and above all, my stethoscope, which is the best part of my legacy.*”

#### BIBLIOGRAPHY

1. Bloch H. The inventor of the stethoscope: Rene Laennec. J Fam Prac 1993; 37:191.
2. Kligfield P. Laennec and the discovery of mediate auscultation. Am J Med 1981; 70:275-8.
3. Nuland SB. Doctors: The Biography of Medicine. Reissue edition. New York: Vintage, 1988.
4. Sakula A. R.T.H. Laennec 1781-1826: His life and work: a bicentenary appreciation. Thorax 1981; 36:81-90.
5. Sataline L. What the stethoscope said. Ann Int Med 2002; 136:779-80.
6. Underwood EA. The training of the greatest of chest physicians: Laennec. Parts I & II. Br J Dis Chest 1959; 53:109-12, 121-4.