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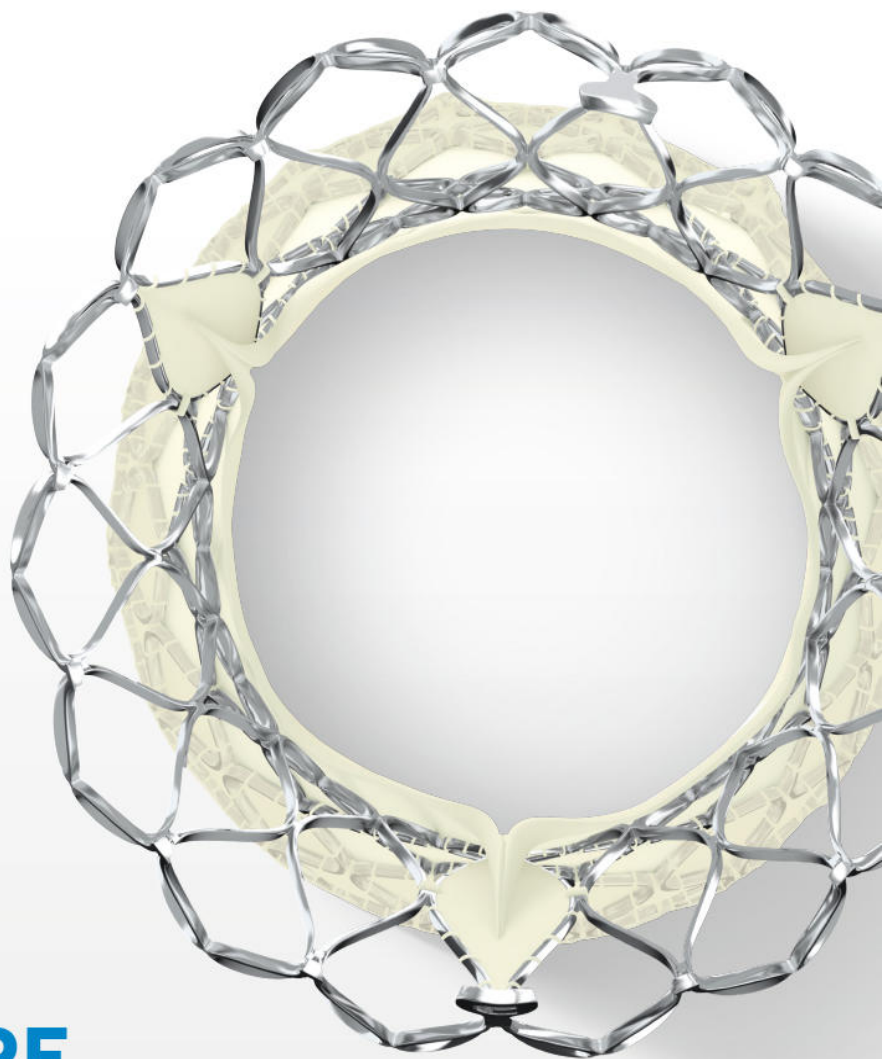
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Profiles in Cardiology

This section edited by J. Willis Hurst, M.D., and W. Bruce Fye, M.D., M.A.

Augustus Desiré Waller

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The name of Einthoven has figured most prominently throughout the history of electrocardiography; however, the name of Waller should also be recalled as that of an important pioneer in the development and clinical implementation of the first technological innovation for the diagnosis and management of cardiac disturbances.

Augustus Desiré Waller (Fig. 1) was born in Paris in 1856, the scion of an eminent scientist, Augustus Volney Waller, who was noted for his work on nerve degeneration, now eponymously known to us as Wallerian degeneration. Young Waller lost his father and role model in 1870, when the boy was only 14 years old. Even at that tender age, Augustus Desiré wanted to emulate his father. The boy's upbringing now rested on the shoulders of his mother who, for personal reasons, moved with her son to Scotland, where eventually he studied medicine at Aberdeen and Edinburgh. Immediately upon graduation, Waller began his lifelong career in physiology, contributing a great deal to this discipline in due course. His textbook *An Introduction to Human Physiology*, published in 1891, was at that time a comprehensive treatise on the subject.^{1,2}

His first academic appointment was as lecturer at the School of Medicine for Women in London in 1883. The following year, he was also appointed lecturer in physiology at St. Mary's Hospital in Paddington. Waller remained at St.

Mary's until 1903, when he was appointed professor of the newly established physiologic laboratory at the University of London. This was followed very shortly by his appointment as consulting cardiologist to the National Heart Hospital in London where he continued his clinical investigations in electrocardiography.³

Waller also maintained a private physiologic laboratory at his spacious home in St. John's Wood, London.⁴ He was helped here by his wife who had qualified in medicine but never practiced her profession. He had three sons and a daughter, none of whom married. His children were often the subject of his electrocardiographic studies, but his best known subject was his bulldog, Jimmy.⁵ There are many photographs of Jimmy either by his side or standing in a tray of saline having an electrocardiogram taken.^{3,6}

Perhaps the biggest supporter of Waller in his role as a pioneering force of electrocardiography was Edwin Besterman and his colleagues of the Waller cardiopulmonary unit at St. Mary's Hospital in London.³ Waller's initial work on electrocardiography was conducted at St. Mary's Hospital, and it was there that he gave the first public demonstration of his recording device. Waller's original apparatus and some of the tracings obtained with it are still housed in this unit.⁶⁻⁸

It is true that Alexander Muirhead may have been the first to record a human electrocardiogram, but Waller was the first to do so in a combined clinico-physiologic setting, the first to publish a report on his findings, and a pioneer in acquiring extensive experience with this new diagnostic modality. Muirhead conducted his investigations with a Thompson siphon recorder at St. Bartholomew's Hospital in 1869 or 1870. The device had been designed by William Thompson to record signals passing through the newly laid transatlantic cable.⁹ Prior to this, electric potentials of the heart were obtained from exposed animal hearts.¹⁰

Initially, Waller had said "I do not imagine that electrocardiography is likely to find any very extensive use in the hospital. It can at most be of rare and occasional use to afford a record of some rare anomaly of cardiac action."¹¹ No doubt, his continued usage of the modality caused him to change his mind because in 1917, just six years after expressing this sen-

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FIG. 1 Augustus Desiré Waller, 1856–1922. Waller and his famous dog Jimmy. Source: *Brit Heart J* 1979;42:61–64 (Ref. No. 3). Reproduced with permission from the BMJ Publishing Group.

time, Waller presented before the Physiological Society of London a paper entitled “A Preliminary Survey of 2,000 Electrocardiograms.”¹² This was also the first time that he used the word “electrocardiogram” in an official manner; prior to this he had referred to the tracings as “electrograms.” This raises the question as to who really coined the word “electrocardiogram.” Einthoven attributed it to Waller,¹³ as did Waller’s daughter, herself a lecturer in physics. Sykes, however, found no evidence of this, advancing on the other hand the proposition that Einthoven really coined the term but attributed it to Waller as a token of respect and generosity toward his colleague.¹⁴

The groundwork for Waller’s presentation to the Physiological Society began in 1887 and 1888 when he published his findings, first, on electric potentials obtained from intact living animals, and then from the limbs and chest of humans.^{10, 15} He used the Lippmann capillary electrometer to deflect a light beam from the recording of these electrical forces. The Lippmann capillary electrometer was a far better device than the siphon recorder for measuring the electrical activity of the heart.

Besterman relates an interesting anecdote that illustrates Waller’s gentle personality, that of a man who could appreci-

ate without umbrage a greeting from his students after his marriage to one of them. The student he married was Alice Mary Palmer, the daughter of Sir George Palmer (of Huntley & Palmer biscuit fame). The blackboard bore the inscription “Waller takes the biscuit.” Waller, in good humor, and not the least offended, added the words “and the tin as well.”³

Another interesting facet of his personality can be appreciated by the recollection of Robert Marshall wherein Waller is portrayed as possessing a “certain unconventionality”:

Waller presented a very different appearance from that of our physicians, who were always soberly garbed in frock coats or morning coats and silk hats. He was a short, stocky man, very light on his feet. His gray beard and double breasted blue jacket made him look exactly like a skipper in the merchant navy. Like Sir Winston, he seemed to be habitually smoking cigars, and was invariably followed by his bulldog, Jimmy, who also had a Churchillian quality and had the distinction of having had a question asked about him in the House of Commons.

Q. ‘At a converzaione [*sic*] of the Royal Society at Burlington House on May 12th last, a bulldog was cruelly treated when a leather strap with sharp nails was wound around his neck and his feet were immersed in glass jars containing salts in solution, and the jars in turn were connected with wires to galvanometers. Such a cruel procedure should surely be dealt with under the “Cruelty to Animals Act” of 1876?’

A. ‘The dog in question wore a leather collar ornamented with brass studs, and he was placed to stand in water to which some sodium chloride had been added, or in other words, common salt. If my honourable friend had ever paddled in the sea, he will appreciate fully the sensation obtained thereby from this simple pleasurable experience!’³

Throughout his career, Waller received many awards in Britain and abroad. A notable one was election as a fellow of the Royal Society at the young age of 35, the same age his father had been at election.¹⁴ Waller’s one consuming pastime was dashing about with the newly invented motor car. He was somewhat of a showman and enjoyed giving popular lectures. His spacious home was often the seat of entertainment for visiting scientists.

Waller died in 1922 after suffering two strokes. That same year a summary of his electrocardiographic investigations and viewpoints was published in a monograph edited by his son.¹⁶

Waller and Einthoven should stand side by side in the historical annals of electrocardiography. Burchell pointed out quite rightly that although the two men were alike in their manifold contributions to the new science, they were quite different in so many ways. Einthoven was formal while Waller was quite informal and folksy. Einthoven was methodical and demanding of technical perfection whereas Waller was not too keen on overcoming technical mediocrity. Einthoven was much more inclined toward application of this modality in the

clinical arena. Waller, on the other hand, although working in a hospital-based school, was apparently not greatly interested in exploring its utility in the management of the sick.⁷

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