

# ON THE SIGNIFICANCE OF



# THE CIRCLE OF TUGO



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**A**lmost two hours into the neuroanatomy exam, with only a minute to spare, I turned the last page to read the final question: "Describe the location of the Circle of Tugo." Although I had diligently memorized hundreds of structures, circuits, and pathways, I could not recall anything about this structure. I thought, however, that the fault was with me, since I reasoned that if there was a Circle of Willis, there must also be a Circle of Tugo somewhere in the central nervous system.

Time ran out, the question was left unanswered, and I left the classroom with a feeling of disappointment. Later that day, I searched for this structure in several neuroanatomy textbooks, but found nothing. When the exam solutions were posted the following week, I immediately turned to the last page to find the answer to the final question. Imagine my surprise when I saw that the location of the Circle of Tugo was given in the form of a street map. The Circle of Tugo was not an anatomical structure but a traffic circle, or roundabout. And not any random roundabout, but the one at the intersection of Louis Pasteur and Longwood avenues in Boston, directly facing the Harvard Medical School quadrangle.

My classmates and I took the answer as a joke by the professor but I remained intrigued. After class I found the Circle of Tugo—the Circle of Oscar C. Tugo, to be more precise. But who was Oscar C. Tugo, and why was he commemorated in the Longwood medical area? Was he a famous physician? A celebrated professor? The discoverer of an important molecule or principle? The answer was unexpected. Searching online and digging into the

**Dedication of the Oscar C. Tugo Circle at the intersection of Longwood and Louis Pasteur Avenues in Boston, May 18, 1921.**

From reference 1.

## On the significance of the Circle of Tugo

archives of the Countway Library of Medicine, I learned that Oscar C. Tugo had been a member of the American Expeditionary Force Base Hospital No. 5 during World War I, and the first member of this unit to be killed in action.<sup>1-7</sup>

The United States had maintained a cautious but observant stance towards the war in Europe since its beginning in 1914. After the sinking of the RMS *Lusitania* in 1915, in which 128 Americans lost their lives, pressure began to mount for President Woodrow Wilson to declare war against Germany. The president had managed to maintain official neutrality until early 1917 (even while the country was unofficially aiding the Allied effort), when an all-out German submarine offensive against all commercial ships traveling to England resulted in the sinking of several American ships. The declaration of war on April 6, 1917, activated official mechanisms to support the preparedness movement that had been in place since early 1915. In addition to fighting troops, the French and British commanders were also in urgent need of engineers and doctors.<sup>1-2,8-11</sup>

In the fall of 1915, U.S. Army Surgeon General Dr. William C. Gorgas had proposed the organization of university-sponsored base hospitals under the auspices of the American Red Cross to Dr. George W. Crile of Western Reserve University and Dr. Harvey Cushing of Peter Bent Brigham Hospital. Both men had led volunteer medical units earlier in the war.<sup>3,4</sup> In October 1916, to assess the readiness of the unit and rehearse some of the operations to be conducted, Base Hospital No. 41, under the leadership of Dr. Crile, performed mobilization exercises at Philadelphia's Fairmont Park. (The Base hospitals were numbered somewhat arbitrarily—Base Hospital No. 1 of Bellevue Hospital, for example, did not enter service until February of 1918.<sup>3,12</sup>) Dr. Cushing, in charge of Base Hospital No. 5, planned similar exercises for the following summer on the Boston Common.

Dr. Cushing further planned to use his mobilization exercises to deliver actual medical care to the public, with the goal of generating enthusiasm and recruiting volunteers for the unit. Once war was declared, in a May 1917 editorial, "War Obligations," published in the *Boston Medical and Surgical Journal* (later the *New England Journal of Medicine*), the Massachusetts Medical Society exhorted physicians to "enlist in the Medical Services of the Army or the Navy" or "help organize base hospitals." The following month, the society, at the annual meeting of its council, voted on several resolutions in support of the war efforts.<sup>1,3,11,13,14</sup>

The Boston medical community responded promptly,



**Harvey Cushing, 1917.** Reproduced by permission of the Yale University, Harvey Cushing/John Hay Whitney Medical Library.

but there were non-medical personnel needs to be met. The Harvard unit was summoned to action and all activities focused on meeting the remaining personnel needs of the unit.<sup>1,3</sup> The telegram ordering the unit to duty was printed in several Boston papers:

Orders have been received from the office of the Adjutant-General of the United States Army to have Base Hospital No. 5 ready for immediate service abroad. The mobilization on the Common will have to be abandoned. It is necessary to complete full equipment of enlisted personnel in the next few days. Wanted cooks, waiters, clerks, orderlies,



**Edward Revere Osler at 13 Norham Gardens in 1916.** Reproduced by permission of the Osler Library of the History of Medicine, McGill University.



**Oscar C. Tugo.** From Reference 1.

carpenters, electricians and other artisans for enlistment in the Medical Corps. Men who have seen service in the Army, Navy or Marine Corps preferred. Age limit 40 years. Apply at the Harvard Medical School, Tuesday between 4 and 9 in the evening.<sup>1pp3-4</sup>

Twenty-four-year-old Oscar Tugo from the Forest Hills neighborhood of Boston promptly signed up. Born in Boston, Oscar was the eldest son of the Tugos, a family of French-Canadian origin. When he was six years old, his family moved

to Chicago, where he attended the Nettlehorst Grammar School and was described as a “typical high-spirited American youth, a leader among his companions, a good student, and a clean home-loving boy.” He later attended the Chicago Business College, and after graduation was employed by various railroad companies, including the Pullman Company. After returning to Boston with his family, he was employed as a clerk by the Clyde Steamship Company.<sup>1</sup>

On Tuesday, May 1, 1917, he read the notice for enlistment in the morning paper, went directly to the medical school that

CUS417/52.116

(Letter to Dr. Cushing)  
from Lady Osler

13, NORHAM GARDENS /  
OXFORD

Sept. 7th (1916)

Osler, Lady

Dear Harvey

I have been too sorry not to see Dr. Jones - but he has promised to come on his way back from France. We have had a wild goose chase - Sir William has been on the rampage lately and we had to break an engagement with the Harvard men as he was called away - he saw him yesterday in town and had a nice chat. I am so proud of the Harvard men and so ashamed that the Hopkins has shown such a mean little spirit - when it might have done so much good. Goodness - I wish you could come again; Surgery seems to me to grow more wonderfully interesting every day - but I suppose the kind I see - or the results would not interest you so much - although just now there are so many heads bound up - that I daresay there would have been cases for you.

I have but one regret and that is that I am not a trained nurse. It is so wonderful too - the evolution of the V.A.D. - the work those girls do is simply wonderful and it will I am sure necessitate a reorganization in nursing methods when the war is over - The women orderlies are conspicuous now - and the army cook in military hospitals is being replaced by women. There will be a high old time suppressing the women if the war is ever over. We have had a delightful visit from Dr. Welch - he is in France now - and I hope will be able to see much. Sir William is at Newcastle just now for the British Asso - and to see Revere - who may go off at any time now - in the Artillery - He is very well & likes the work - in a way. Do you suppose he will be spared to us? It is all too horrible to write about. The streets are full of legless & armless men. We have our officers hospital now, about 260 beds - and it is pathetic to see men we have seen in College so full of life - now on crutches or being pushed about in a chair. Somehow - the legless Scots are the saddest of all - for they look so tough - but they are all merry & say "Thank God I am out of that Hell."

I am so glad our adopted children have made such a good impression at L.B.H. - I wish you could find a place for Campbell H. - in Boston, it is a crime for them to be in Iowa and have those children grow up there. You and Dr. Christian might concoct something for him - very much love to you & Kate

Always fondly  
Tanta Grace

Miss. Kate

Transcript of September 7, 1916, letter from Grace Osler to Harvey Cushing. Courtesy of the National Library of Medicine.

afternoon to sign up, and ten days later was aboard the RMS *Saxonia* sailing towards Falmouth, England. Unrestricted submarine warfare was still in place, with German U-boats actively trying to sink any vessels that might be transporting troops and supplies to England. Eight days into the crossing, approaching England and the exclusion zone patrolled by the Germans, everyone aboard was asked to wear life jackets constantly until arrival.<sup>1-3</sup>

The *Saxonia* arrived in Falmouth on the morning of May 22, 2017. The men of the unit were sent to Blackpool for training, while the nurses and officers boarded trains to London. The unit reunited seven days later in Folkstone on the English Channel in preparation for their crossing to France the following day. On the evening of May 30, under the protection of a dense fog, and with several destroyers flanking the convoy, the unit landed in Boulogne in northern France, and was sent to reinforce British Base Hospital No. 11, fifteen miles south

between Dannes and Camiers.<sup>1-3</sup>

British Base Hospital No. 11 was an assortment of canvas tents and a few permanent wooden huts located in a low-lying area that was semi-flooded most of the time, especially during the particularly rainy summer of 1917.<sup>1,2</sup> Also dampened was the spirit of the British doctors, nurses, and other volunteers, who had been serving there for much longer and with significantly fewer resources than had initially been anticipated.<sup>2</sup> The conditions were best described in verse by one of the men of Base Hospital No. 5 (M.E.R.C. stands for Medical Reserve Corps):

In Camiers by the sea, in the 5th M.E.R.C.  
In mud up to my knee, and it's mud we get for tea;  
The stretchers, I found, came hard up from the ground.  
You had to hustle, use all your muscle,  
And the nurses wore a frown.<sup>3p39</sup>



Camiers Camp, looking toward "A lines" with the cement works beyond. From reference 3.

The initial focus of members of Base Hospital No. 5 was in helping to clean and organize the site. The transition was eased by the relatively few casualties brought in early in the summer; the wards were instead full of cases of infection. Base Hospital No. 11 had a capacity of 2,000 and was always nearly full. In contrast, the members of Base Hospital No. 5 had prepared to care for 500 patients; the need for reinforcements was obvious. The Germans conducted frequent air raids in the area, so that a sense of danger and alarm pervaded the camp.<sup>2,3</sup>

In late July of 1917, the Allies launched an offensive against the Germans designed to retake the city of Ypres in western Belgium and interrupt the supply lines of the German Fourth Army. Known as the Third Battle of Ypres (or the Battle of Passchendaele after the last town taken by Canadian forces during the campaign), the action took place only sixty miles from Dannes-Camiers. In August alone, more than 5,000 casualties were evacuated to Base Hospital No. 11. Among those fighting in this offensive was Lieutenant Revere Osler, great-great-grandson of American patriot Paul Revere and son of Sir William Osler.<sup>2,8-10,15-17</sup>

Revere Osler was born in Baltimore in 1895, during his father's tenure at Johns Hopkins. He was the Oslers' only son. When the boy was ten years old, the family moved to England after Sir William accepted the Regius Chair of Medicine at Oxford University. At the time of the Third Battle of Ypres,

Revere had reached the rank of Second Lieutenant with the Royal Field Artillery, his third tour of duty during the war, and his second with the British army. He had served his first term in 1915 with the McGill Hospital Unit, which had operated at the site of British Base Hospital No. 11 in Dannes-Camiers. The Oslers in Oxford endured each of Revere's tours of duty with great apprehension, continually fearing the worst and being comforted only by their son's frequent letters.<sup>15-17</sup>

The Oslers and Harvey Cushing had known each other since the late 1890s, when Cushing was a surgery resident at Hopkins. Knowing that Cushing was in the area, on August 19 the Oslers informed him of Revere's presence at Ypres, and asked him to check on their son. Cushing was unable to see Revere until the night of August 29, when he was summoned by telegram to care for him after he was seriously wounded in battle. Cushing traveled sixty miles in the rain to Casualty Clearing Station No. 47 in Dozinghem, Belgium, where he found the wounded Revere still conscious but with a very weak pulse. Dr. George Crile, director of Base Hospital No. 41, and Drs. George Brewer and William Darrach of Base Hospital No. 2 (New York Presbyterian) were also summoned to care for Revere. He was operated on and received two blood transfusions, appearing to initially improve, but dying suddenly five hours after the operation, in the early morning of August 30, 1917.<sup>13,15-17</sup>

CUS417/52.128  
13, Norham Gardens, Oxford.  
Friday (Aug. 31st, 1917)

Dearest Harvey

Our one comfort is that you were with him - No one in the world could have done as much and no one been fonder of him - I can only think what an agony it was to you when you saw him come in. You will tell us Everything I know - Dear Revere, he was living for his leave - a letter last evening told what we would do - I hope he knew you and could talk to you - It is very hard - & we are getting old. There was a fine life in store for the boy - but it couldn't be. I always expected this to happen - but I never could be ready - Kate will know through Otilie - we cabled. What a marvel it is that we have you all to help us - and your children.

Tom Fatcher will be here in a day or two I hope.

Our love -

Tante Grace.

Transcript of August 31, 1917, letter from Grace Osler to Harvey Cushing. Courtesy of the National Library of Medicine.

Revere Osler was buried later that morning in a nearby field (currently the Dozinghem Military Cemetery in West-Vlaanderen, Belgium), attended by all who had cared for him during his last hours. A telegram about Revere's injury, sent by Cushing the night before, reached the Oslers that afternoon, and they immediately began to make arrangements to travel to France. But at 9:00 that evening they were notified by phone that their son had died. Sir William's grief at the death of his only son was unremitting; he died fewer than two years later, in July 1919.<sup>15-18</sup>

One might imagine that if Revere Osler had continued to serve with the Hospital Unit in Dannes-Camiers, away from the enemy lines, his death could have been avoided. But on the evening of September 4, only five days later, tragedy struck Dannes-Camiers and Base Hospital No. 5. Earlier that evening, an apparently unsuccessful German air raid had taken place on the English coast. The all-clear had sounded when at 10:55 PM, without any warning, a German Gotha bomber swept over the area of Base Hospital No. 5 from the direction of the nearby town of Étapes. Five bombs hit the hospital. The first two hit one of the officers' tents, killing Lt. William T. Fitzsimmons and wounding four others, the second two hit one of the patient tents, killing Private Oscar C. Tugo and re-wounding many

of the British patients in that tent. The fifth bomb hit the reception tent, usually one of the busiest places in the entire complex, killing Private Rudolph Rubino and Private Leslie A. Woods, and severely wounding Private Aubrey S. McLeod and Sergeant William E. English.<sup>1-4</sup>

The bombs dropped by the Germans were of the "daisy-cutting" variety, sending low-flying projectiles in all directions, wounding many others besides those affected by the direct impact.<sup>2-4</sup> In the chaos that ensued, Dr. Elliot Cutler, later surgeon-in-chief at the Peter Bent Brigham Hospital, operated on many of the wounded. Three days later, the bodies of Lt. Fitzsimmons and Privates Tugo, Rubino, and Woods, the first American casualties of the war, were buried at a nearby cemetery in Étapes. More casualties among the wounded followed.<sup>2-5</sup>

Base Hospital No. 5 was later transferred to nearby Boulogne and continued to care for the wounded with distinction until early February of 1919, almost seven months longer than initially intended. Cushing estimated that approximately 46,000 sick and wounded—most of them British—were treated at Base Hospital No. 5 during the unit's service.<sup>2,3</sup>

The remains of Private Oscar C. Tugo were returned to Boston and reinterred with full military honors at the Forest

Hills Cemetery on December 26, 1920. Oscar's father, Smith C. Tugo, like Sir William Osler, also could not bear the loss of his son and died in February 1921. He was interred next to his son. On October 19, 1921, the Oscar C. Tugo Circle, at the intersection of the Longwood and Louis Pasteur Avenues in front of Harvard Medical School, was dedicated to honor the memory of the first enlisted member of the American Expeditionary Force to be killed by the enemy.<sup>1,5,7</sup>

Besides their legacy of courage and service, the men and women of Base Hospital No. 5 also made important contributions to modern medicine. Cushing pioneered many new methods for the treatment of penetrating head injuries, including suction and magnetic extraction of debris, that enabled significant improvements in mortality.<sup>19</sup> Harvard Medical School's Walter B. Cannon performed important studies on hemodynamics and shock, initially at the Casualty Clearing Station No. 33 in Bethune, France, and later in England.<sup>3,20</sup> Elliot Cutler credited much of his ability to handle a large volume of difficult cases to his experience in the war, and went on to pass along this skill to many generations of surgery residents.<sup>21</sup>

Others in the same circle of Harvard Medical School include Dr. Paul Dudley White at Base Hospital No. 6 (Massachusetts General Hospital) and Dr. Samuel Levine at the British Heart Hospital in Colchester, England, who accurately characterized the condition of neurocirculatory asthenia (a condition related to panic disorder) based on their experiences with war patients.<sup>20-24</sup>

Very much like the Circle of Willis, which provides alternate blood flow paths at the base of the brain, today the Circle of Tugo provides alternate paths for drivers at a busy intersection in the Longwood medical area. However, just as the Circle of Willis functionally represents much more than a simple anastomotic group of arteries, the Circle of Oscar C. Tugo is also much more than a roundabout at the intersection of Longwood and Louis Pasteur Avenues—it is a memorial of selflessness, valor, and achievement that connects the stories of some of the greatest names in the history of American medicine. During this centennial commemoration of World War I, as the country continues its struggles to provide adequate care to the wounded men and women of recent wars, it is fitting to remember the story of Private Oscar C. Tugo and of all the men and women who were part of the same cause.

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