‘Happy Researches’: On the 400th anniversary of the birth of Thomas Willis

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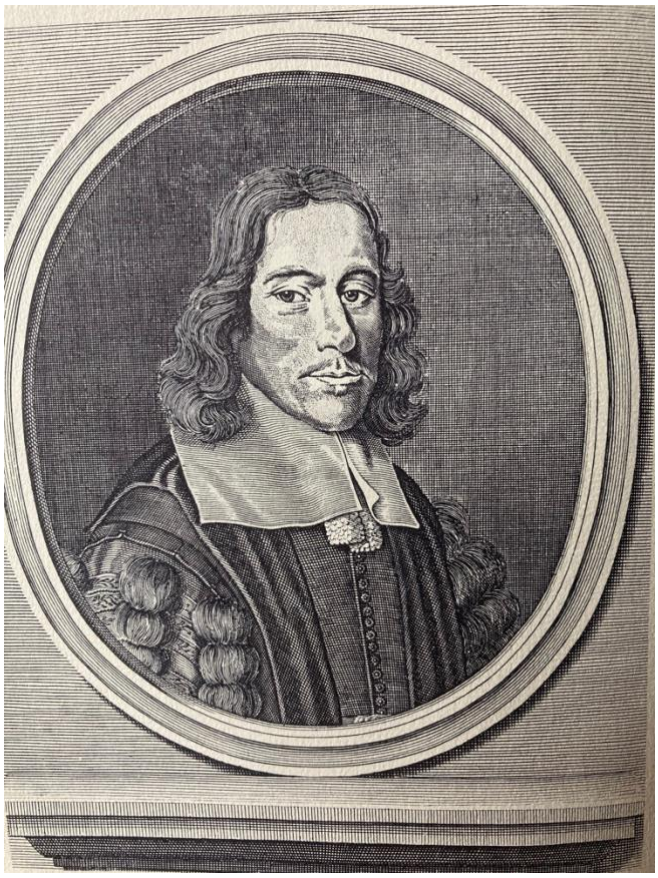
> ‘a man of no carriage, little discourse, complaisance, or society … yet for his deep insight, happy researches in natural and experimental philosophy, anatomy, and chemistry … none since hath equalled, much less outdone him’. Anthony Wood[1]

400 years after the birth of Thomas Willis (1621–75) why should you be even reading this article? Put simply because he remains truly inspirational through his life and work.



Called ‘the Harvey of the brain’, Thomas Willis founded clinical neuroscience. He conceived the term ‘neurology’, that word, by which the majority of you reading this article professionally define yourselves and have devoted the best part of your life. For younger readers, I hope Thomas Willis will inspire you to devote your talents and time in continuing his work with its goal of effective intervention to cure neurodisability.

He is far more than the eponymous ‘The Circle of Willis’. He named the structures of the brain, reclassified cranial nerves (adding the ophthalmic branch of trigeminal and accessory nerves to the number), gave the first description of reflex action, described the chordae Willisii in the superior sagittal sinus, the phenomenon of paracusis Willisii, and introduced caffeine for headache.[2]

Willis’ research into the brain was a political act in support of the restored monarchy and church. His medical practice was state of the art at the time. His entire published works are very broad and define mid-17th century medicine. His other discoveries include: diabetes mellitus, myasthenia gravis, foundation texts in epidemiology (description of typhus/typhoid epidemics), and psychology/psychiatry.[3]

In the midst of the current COVID pandemic some of us may be feeling hard done by in life. For Willis there was civil war, and as a student at Oxford (the royalist capital in that Civil War) there was an epidemic of Camp Fever (typhus which he later wrote up), which killed his father and stepmother. As the eldest son, Willis took up medical studies to pay the family bills. These studies were hugely interrupted by the Civil War

and having enlisted as a royalist soldier, his entire clinical training was exceptionally brief, most likely 8 weeks. During his subsequent medical practice he had to deal with other epidemics of meningitis, influenza, smallpox, and encephalitis lethargica.

His writings describe for the first time in the history of medicine a clinical history, treatment, and, wherever possible, postmortem findings with interpretation. His chapter on childhood epilepsy in *Pathologicae Cerebri* (1667) can be seen as the foundation stone of paediatric neurology. Other paediatric cases include non-accidental injury, coma, neurological regression, autistic savant, pseudo seizures, stroke, and cerebral tumours. He introduced caffeine for the treatment of headache. His chapter 'Folly and Stupidity' in *de Anima Brutorum* (1672) laid the foundation for understanding and compassionate support of children with learning difficulty, with his ideas being taken forward by John Locke (1632–1704).[4]

Willis remained deeply religious throughout his life, practiced his faith illegally at his home during the Commonwealth period. He worked 7 days a week and especially on Sunday's treated the poor for free.

Perhaps his greatest success was a case series of four children who died of neonatal seizures, but devised an intervention leading to three later surviving siblings. That precedent a treatment to reduce suffering, disability, and death is an idea which still drives.[5] Willis' reputation is still growing.

This animated image of the base of the brain from Cerebri Anatome (1664) drawn by Sir Christopher Wren (1632–1723) shows the living brain as Willis would have truly

seen it. Today with our more detailed imaging, we too can stand back and forget the brain is living. Willis a serving soldier would have seen very many open head injuries with exposed pulsing brain tissue, especially when a besieged Oxford came under intensive cannon fire.

On such an anniversary it is timely to also look forward. So what would a future historian 400 years from now think of 21st paediatric neurology? Hopefully they would have access to the virtual 2021 BPNA Annual Meeting. They would say the specialty was very much still evolving. Noteworthy features are the 2017 epileptic encephalopathy classification, the DSM-V diagnostic criteria for autistic spectrum disorder (likely to undergo further evolution), and for PANDAS the current debate of whether it exists at all.

This 400th anniversary is timely because Willis' goal of effective intervention to cure neurodisability is now being realized. New genetic treatments for spinal muscular atrophy type 1/2 offer promise of long-term survival, if not potential cure.

References

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