

No 16 Rudolph Magnus (1873 – 1927) (I)

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1. The last couple of talks were about Sir Charles Sherrington, the great neuroscientist, who made a direct reference to Alexander in his book *The endeavour of Jean Fernel*.
2. He was talking about the borderline or interaction between the reflex and the voluntary control of muscles. He was making the point that it is difficult to know the exact way in which we things because once the brain has made a decision to act, a lot of the detail of how exactly we do it is handed over to the reflex system.
3. He said:

*Mr Alexander has done a service to the subject by insistently treating each act as involving the whole integrated individual, the whole psychophysical man. To take a step is an affair, not of this or that limb solely, but of the total neuro-muscular activity of the moment – not least of the head and neck.*¹
4. I finished off the talk by saying that I am convinced that in the long march towards greater understanding of neurological and general scientific underpinnings of the AT, there is an awful lot to be learned from Sherrington's work.
5. My next neuroscientist is Rudolph Magnus who was inspired by Sherrington and basically worked out the neuroscience of posture. Magnus is one of those scientists whose work has truly stood the test of time.
6. I was reading about posture in a modern medical textbook on the central nervous system and though it does not mention Magnus by name, its description of the postural reflexes could have come straight from Magnus himself.²
7. Magnus never said anything about the Technique, and living and working as he did in Germany and Holland he probably never heard of it.
8. He does not deal with the "integrated individual". His research was almost entirely concerned with the reflex, the automatic, elements in posture, but he is important to us because when

¹ Sherrington (1946)p85

² See Brodal (1998) p353

Alexander came across his work in the middle 1920s, it crystallised his thinking about the head-neck relationship.

9. Alexander had long known of the importance of this to the functioning of the whole body. But after he learned of Magnus' work he began to refer to it as the "*primary control*" and he believed that Magnus' work gave a scientific underpinning to what he himself had discovered from his work on himself and his pupils.

10. Alexander refers to Magnus' work on various occasions in his books and lectures, and John Dewey mentions him in his introduction to *The use of the self*. Dewey says:

*Magnus proved by means of what may be called external evidence the existence of a central control in the organism. But Mr Alexander's technique gave a direct and intimate confirmation in personal experience of the fact of central control long before Magnus carried out his investigations.*³

11. Alexander also felt it gave him a weapon with which he could publicly challenge the medical profession on its own ground which he did in a letter to the British Medical Journal in 1932 in which he said

*On the strength of forty years' practical experience I am bold enough to believe that this would result in proof of the soundness of my technique as conclusive as has been the case with regard to my employment of the primary control, the existence of which has been conclusively proved by the experimentation of the late Rudolph Magnus of Utrecht.*⁴

12. As I have said before, you don't need to know anything about this to be a good AT teacher but if you want to get into the science of the Technique you really do.

Sources

13. As usual, I'll give you my sources. It's not that I expect you to rushing out to get them any time soon. But it's nice to have them on the record and if at any stage you want to go into of this stuff yourself, the references are there for you.

14. The primary source is the complete report on Magnus' researches which came out in 1924. It was published in

³ Alexander (1932) p9

⁴ Alexander (1995)p134

German but this would not have been a problem to scientists at the time because they all studied German which was known as *the language of science*. But it was a major problem to me when I started looking at Magnus.

15. So you can imagine how pleased I was when a couple of years ago I discovered a copy of a relatively recent English translation from an extremely unlikely source. The translation is called "*Body Posture*" and it was published in India in 1987 on behalf of the United States Department of Commerce, from whom I obtained it.
16. I have now been told that all 800 pages can be downloaded from somewhere on the internet. So this is always an option if you find you have nothing better to do some wet weekend.
17. There is also a very badly written biography by his son which was only published in the year 2000. This was somewhat delayed given that Magnus had died seventy-three years earlier, but it adds some detail on Magnus' life and reprints some of his papers.
18. The most accessible English-language sources for his work are the lectures he gave in Britain after the publication of his major work. In 1925 he delivered a special invitation lecture at the Royal Society in London. It is called the Croonian Lecture and he gave it at the invitation of Sir Charles Sherrington who was President of the Royal Society at the time.
19. The lecture is called *Animal Posture*. If you go along to the library in the Royal Society, you can get a copy. It's a very nice place to visit and full of history. The Royal Society was founded in 1660. Among its early members were Christopher Wren and Isaac Newton. It occupies a splendid building in Carlton Terrace, overlooking Green Park.
20. Magnus also gave two lectures, called the Cameron Prize Lectures, in the University of Edinburgh in 1926, which were subsequently published in the medical journal the *Lancet*. You can get these from the Wellcome Institute Library on Euston Road. This is a fantastic source of information on everything related to the history of medicine and is free.
21. There is also a book published by Stanford University in California which reprints three draft lectures Magnus was scheduled to give there in 1927 but he died before he could do so.

22. Two of these are outside our scope of interest. But the third is quite philosophical and is called *The physiological a priori*. This reflects Magnus' interest in the German philosopher Immanuel Kant.
23. The lecture is a draft and reading it one can only feel an immense regret that Magnus did not live long enough to develop his ideas further.
24. There is also a little gem of a book by Walter Carrington, half of which is devoted to Magnus⁵. This was written in 1950 when Alexander was still alive. It was published in 1994 by STAT books. It also deals with Professor George Ellett Coghill whom I will be looking at after Magnus.
25. This is an extremely useful publication and I thoroughly recommend it. It is in the library – and there may still be some copies for sale.

Rudolph Magnus – biographical details

26. So now we come to Rudolph Magnus, who he was and what he did.
27. Like most famous scientists, his life was fairly undramatic. He was born in Germany in 1873 and grew up a bright and studious child. He studied medicine in Heidelberg University and was awarded his PhD *summa cum laude* in 1898.
28. After he got his doctorate, because he was very bright, he was appointed Associate Professor of Pharmacology in Heidelberg. Pharmacology is the study of drugs, mainly poisons, and how they affect the functioning of the body and the nervous system.
29. In addition to his science, he was a highly cultured man. He was interested in the visual arts and philosophy especially Emmanuel Kant. He also had a special interest in Goethe (1749–1832) who was both a poet and an early scientist.
30. In fact, Magnus took time off from his university and research duties in the early 1900s to repeat Goethe's scientific experiments on colour using the original laboratory instruments in the Goethe museum. He did a series of ten lectures on Goethe's scientific work which were published as a book in 1906. This was published in English in America in 1949 under the title *Goethe as a scientist*⁶ – but I have not seen it.

⁵ Carrington (1994)pp43-54

⁶ O. Magnus (2002)p145

31. In the early 1900s, arising from his work on pharmacology, Magnus became interested in the workings of the nervous system. This was the time when Sherrington was publishing his ground-breaking neuroscientific papers and laying the foundations of modern neuroscience.
32. Magnus had heard Sherrington lecturing at a couple of conferences and was impressed by his work. He realised that one of the neurophysiology problems he was wrestling with could best be researched by going to England and working on it with Sherrington for a while in his laboratory. So, in 1908 he spent his Easter holidays with him in England experimenting on dogs.
33. This was a life-changing event for Magnus. Working with Sherrington gave Magnus his interest in the study of posture which lasted for the rest of his life and on which his reputation mainly rests.
34. It was while he was working with Sherrington that he got the news that he had been appointed Professor of Pharmacology at the University of Utrecht in the Netherlands and he remained in that position until his death.
35. Over the years, he and his team in Utrecht kept up a steady output of scientific papers. They were mainly on different aspects of the neurophysiology of posture but included other subjects over the years. In his lifetime, he published well over 300 papers on various subjects.
36. In 1924, the full report of his studies on posture came out; in 1925 he gave the Croonian Lecture; in 1926 he gave the Cameron Prize Lectures in Edinburgh. The next year he died at the age of 53.
37. If he had lived, his book on posture work would undoubtedly have been translated into English at the time. And he would have been available for the conferences, lectures and visiting professorships by which most scientists make their work known.
38. As it was, he had been nominated for the Nobel Prize in 1927 and would almost certainly have been awarded it but that was the year he died. The Nobel Prize is not awarded posthumously.
39. Everyone who knew him seems to have liked and respected him. He is described as having a candid generous and open

personality⁷ and I have a rather splendid photograph of him in a black hat in one of his books.

The question of posture

40. As AT teachers we are very cautious about using the word posture, not because it is unimportant, but because it is important and is so widely misunderstood.
41. We all know the common reaction we get when we mention to people that we are connected in any way with the Alexander Technique. They stiffen themselves up and stick out their chests and say “*Must watch my posture when I’m with you.*”
42. In fact, as we know posture is extremely subtle, complex and dynamic. It is how we are when we are awake, alert, ready to go into action but still in repose. It is about the disposition of the body parts relative to each other when we are not holding a pose or actively doing something.
43. Sherrington had felt posture provided a very useful entry point into the study of the whole neuromuscular system. In his book *The integrative action of the nervous system* he wrote:

*...much of the reflex reaction expressed by the skeletal musculature is postural. The bony and other levers of the body are maintained in certain attitudes both in regard to the horizon, to the vertical, and to one another...Innervation and co-ordination are as fully demanded for the maintenance of a posture as for the execution of a movement.*⁸
44. It was the complexity of posture and the promise that studying it would lead into a deepening understanding of the neuromuscular system that attracted Magnus. He said in one of the Cameron Prize lectures:

*...posture is an active process, and it is the result of the cooperation of a great number of reflexes, many of which have a tonic character.*⁹
45. “Tonic” means connected with tone – the level of tension in a muscle when it is not doing anything.
46. From the time he spent his Easter working with Sherrington in 1908, up to his death in 1927, the question of posture was Magnus’ dominant scientific interest.

⁷ (Magnus 1930)p244

⁸ Sherrington (1906)p339

⁹ Magnus (1926a)p

47. Between 1908 and 1925, apart from the years of the First World War, Magnus and his team carried out hundreds, if not thousands, of experiments on cats, rabbits, guinea pigs, dogs and monkeys to see what was involved in posture and how the brain controlled it.
48. Essentially, what they did involved very precise and skilful brain surgery - just as Sherrington had done on his own experimental animals.
49. As we saw the last time, the connection between the brain and the rest of the body runs down from the cerebral hemispheres through mid-brain and the brainstem into the spinal cord. This provides a two-way channel of communication from the body to the brain and from the brain to the body.
50. It also means that if there is a break or a transverse cut, through this communication channel, there is no passage of nerve signals between the part of the body above the cut and the part below the cut.
51. We see this when people who suffer damage to their spinal cord find they have no control over the parts of their body below the damage.
52. This is also true if we get inside the inside the brain as well. If cuts are made inside the brain, the part of the brain that is above the cut cannot be involved in whatever is happening below the cut. By making cuts at various levels in the brain, Magnus and his team investigated which aspects of posture are controlled at which parts of the brain.
53. Since they were interested in reflex or automatic – as opposed to learned or volitional behaviour – they normally made the cut below the level of the cerebral hemispheres where thinking and feeling happens. A lot of the time they removed the cerebrum completely and the animal was referred to as decerebrate.
54. The whole area below the cortex is often described as sub-cortical. It is the area of the brain where all kinds of automatic and reflex functions are carried out without any conscious thought. It consists of the brainstem which connects directly to the spinal cord and the bit above it which is usually referred to as the mid-brain.
55. Sometimes, you find this part of the brain referred to as the reptilian brain, since it emerged in the earlier stage of evolution

and is found in fish and reptiles – as well as in the higher animals, including humans.

56. The cortex and its functions emerged much later in evolution. This is why it is sometimes referred to as the neocortex.

57. Next time I will tell you about Magnus' results in detail and how they fit into the AT.

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