

No 21 NIKOLAAS TINBERGEN (1907-1988) (I)

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1. In the last few talks we have been looking at scientists whose discoveries and professional work directly or indirectly provide underpinning for the AT.
2. The last of these was George Coghill who believed that he and Alexander, from completely different starting points, had discovered the same basic principles governing human behaviour.
3. Today, I want to move on to another scientist, Professor Nikolaas Tinbergen who was born and educated in Holland and finished his career as a professor in Oxford. His dates are 1907-1988.
4. Tinbergen's best-known connection with the AT comes from the fact that when he shared the Nobel Prize for Physiology or Medicine in 1973 he used his speech at the prize-giving ceremony in Stockholm as an opportunity to describe and praise the AT publicly.
5. When you consider that most Nobel Prize winners use what is probably the most prominent public platform they ever have in their lives to bring the scientific world up to date on the work for which they are getting the Nobel Prize, this was major surprise, not to say shock, to the scientific world.
6. But it was very useful support and publicity for the Technique – and continues to be so. If you look up the name Tinbergen on the internet you will find, more often than not, that the websites belong to AT teachers who are quoting his Nobel speech on the virtues of the AT.
7. My main written source of information on Tinbergen is a biography published in 2003 by Professor Hans Kruuk who studied for his PhD under Tinbergen in Oxford and later became Professor of Zoology in Aberdeen.
8. You can also download a summary biography of Tinbergen and the text of his Nobel Lecture from the Nobel Foundation website at <http://www.nobelprize.org> Just go to the website and navigate from there.
9. You will also find the text of the Alexander part of Tinbergen's Lecture in Wilfred Barlow's book *More talk of Alexander*.
10. I have to thank Stella Weigell for pointing out that the Nobel Foundation has now put a video of Tinbergen's Nobel speech on its website. It is really nice to see this very eminent scientist

carefully describing his experience with the Technique. The direct link to the video is

<http://www.nobelprize.org/mediaplayer/index.php?id=1584>

11. The lecture lasts for 48 minutes and is in two parts. The first part covers work on childhood autism which Tinbergen and his wife carried out. I know nothing about the subject so I have no comment on that. He starts talking about the Technique at about 32 minutes 30 seconds into the video.
12. So who was Tinbergen, what did he do for a living and what did he say about the Tehnique at the Nobel prize-giving?
13. He was born in Holland in 1907. He was christened Nikolaas but was always known as Niko. From an early age he was interested in biology – and was put in charge of the aquaria in school. For those of you with school-age children, this shows that looking after the school gerbils or goldfish during the holidays can lead to great things.
14. As a teenager, Tinbergen was passionately interested in nature study, especially birds. He developed a talent for drawing wild creatures and he became interested in photography. Both nature photography and drawing were major interests through his whole life – his biography is full of charming little examples of his drawings.
15. He did a degree in zoology in Leiden University in Holland but spent a lot of his time studying the behaviour of birds, especially gulls on the beaches near the University. While he was still an undergraduate, he co-authored a book on a nearby very rich area of wet-land which was full of birds. He also wrote dozens of nature articles for various Dutch magazines.
16. His biographer says
Some of the subjects he covered were bird photography, causes of dune formation, weather systems and cloud formations...birds in towns... observations on wheatears, on storks, on common terns...lapwings, falcons...Despite his young age, here was an author/naturalist in full swing.'
17. He got his primary degree in zoology in 1929, the year of the great economic depression, and there were very few jobs around – especially if your main skill was bird-watching. Even though the

¹ Kruuk (2003)p46

pay was miserable, he took a job as an assistant in the Zoology Department in Leiden University and began to study for a PhD.

18. His PhD subject was a type of wasp – called the bee-wasp. My department of surplus information tells me that the bee-wasp hunts bees to feed its larvae and kills them with a sting on the chin.²
19. As a result of his work on these wasps, Tinbergen got his PhD in biology in 1932 and continued to work in Leiden University. He was now getting into his professional stride and began to develop ways of exploring animal behaviour in the wild – as opposed to in the laboratory.
20. Although the laboratory work of Sherrington, Magnus, Coghill and countless others had uncovered vast amounts of important information about the physiological and neurological workings of animals, people had very little idea why the same animals in their natural surroundings behave in the way they do.
21. This was what Tinbergen set out to understand. It was the beginning of what came to be called ethology – the science of animal behaviour – and Tinbergen was leading the way.
22. He was a superb observer in the field and he also developed ingenious little experiments to establish which stimuli were the most important in provoking different types of behaviour in different kinds of creatures, especially birds. He modestly described his work as “watching and wondering.”
23. Through this work and his writings he began to become well known and he was appointed Lecturer in Experimental Biology in Leiden University. Then came the Second World War.
24. During the German occupation of Holland, he was one of several thousand prominent Dutch citizens held in a German hostage camp. The idea was that if the Dutch resistance carried out sabotage, some hostages would be shot. This was a serious threat – the week before he arrived in the camp, there had been some train sabotage. Five men were selected from the hostages, given two hours to write to their families and then shot.
25. After the war, he picked up his university work again and in 1947, he was promoted to Professor in Experimental Zoology in Leiden. His international reputation continued to grow and he was invited on lecture tours in the US and England.

² Ibid.55

26. I noticed an article in the *New Scientist* (29 August 2009) on the effect of wearing red, in which the author says:

One of the first scientists to explore the effect of red on animal behaviour was Nobel prizewinning ethologist Niko Tinbergen. Around 60 years ago he noticed that whenever a red postal van parked outside his window, the sticklebacks in his aquarium would adopt an aggressive head-down posture normally reserved for encounters with rival males.

27. But it was not just idle watching. As his biographer put it, Tinbergen believed that:

Behaviour has a purpose, even though animals do not know that, and it has been selected in evolution because it has a biological function that contributes to the preservation of the individual and the species.³

28. Although there is no reference to Coghill in Tinbergen's biography, his thinking seems to have been compatible with Coghill's idea of the total pattern. According to his biographer, Tinbergen's scientific idea or model of behaviour was based on an

hierarchical system...of nervous centres, the higher centres controlling a number of centres at a next lower level, each of these in their turn controlling a number of lower centres...⁴

29. One can see that a person who thought like that could be disposed to find the AT interesting. But that came much later.

30. Towards the end of the 1940s he began to find life in Leiden rather narrow and repressive and he moved to Oxford University in 1950 and became Head of the Department of Zoology. The following year, his major work *The study of instinct* which was based on his research in Leiden was published and this had a big scientific impact.

31. He had now become a major scientist on the international stage. He wrote lots of scientific papers, attended conferences and delivered guest lectures at various institutes and universities. He was elected a Fellow of the Royal Society in 1962 which is the highest award for a scientist in Britain.

³ Ibid.146

⁴ Ibid.146

32. He was appointed Professor in Animal Behaviour in Oxford in 1966.⁵ He was invited to deliver the Croonian Lecture in the Royal Society in 1972 – the same prestigious platform from which Magnus had told the world the results of his postural studies in 1925.
33. At a personal level he was rather shy and reclusive. His biographer said “*He was a workaholic with deep-seated feelings of guilt.*”⁶ He was quite austere in his personal habits though a heavy smoker of roll-ups. Particularly in later life, he had a lot of ill-health and suffered from stomach ulcers, stress and depression.
34. But those who worked with him spoke highly of him as a person, finding him pleasant and friendly. One of his most famous students and long-term friend was Desmond Morris who wrote a very big best-seller called *The Naked Ape* which made him a millionaire. Another of his students who also went on to become extremely famous, though not in bird-watching, was Richard Dawkins.
35. Just on the verge of Tinbergen’s retirement from Oxford in 1973, he and two other researchers into animal behaviour, Konrad Lorenz and Karl von Frisch were awarded the Nobel Prize for Physiology or Medicine. The citation said they were “*the most eminent founders of a new science, called ‘the comparative study of ‘behaviour’ or ‘ethology’*”; the word comes from the Greek for character.
36. He was, in fact, the second member of his family to get a Nobel Prize. His brother Luuk got the Nobel Prize in Economics in 1969 but he and Niko were never particularly close.
37. Now we come on to the AT bit. Just before the Nobel Prize, in about 1973, his daughter, Janet, who was a cello player had been suffering from back and neck problems and had some AT lessons. She felt they helped and told her Dad, and Tinbergen read Wilfred Barlow’s book, *The Alexander Principle*.
38. He became intrigued by the whole thing and he and his wife signed up for lessons with Dick and Elizabeth Walker in Oxford. He was about 65 when he had his first lessons. He became an immediate and highly enthusiastic convert – I know the feeling.
39. When he stood up to make his Nobel Prize acceptance speech, instead of bringing the assembled dignitaries up to date

⁵ Ibid.237

⁶ Ibid.161

on the work for which he was getting the prize, he told them he wanted to give them two examples of how the techniques of “*watching and wondering*” could contribute to the relief of human suffering, in particular that caused by stress.

40. The first half of his Nobel lecture was devoted to the problem of Early Childhood Autism on which he and his wife had been working. They published a paper on their work in a scientific journal in 1972.
41. Tinbergen discusses some new therapeutic approaches and appealed to those dealing with autism to give these the benefit of the doubt and try them out. Autism is not a subject about which I know anything so I will not try to discuss their work.
42. He then turned to the Alexander Technique. He had had about fifteen lessons at the time.

My second example of the usefulness of an ethological approach to Medicine has quite a different history. It concerns the work of a very remarkable man, the late F. M. Alexander. His research started some fifty years before the revival of Ethology, for which we are now being honoured, yet his procedure was very similar to modern observational methods, and we believe that his achievements and those of his pupils deserve close attention.⁷

43. He gave a short biographical sketch of Alexander and his work and then referred to Barlow’s book “*The Alexander Principle*.” He says “*I must admit that his physiological explanations of how the treatment could be supposed to work (and also a touch of hero-worship in his book) made me initially a little doubtful and even sceptical.*”
44. But he and his wife decided to give it a try and in his own words “*undergo treatment ourselves, and also to use the opportunity for observing its effects as critically as we could. For obvious reasons, each of us went to a different Alexander teacher.*”
45. He goes on to say that
We discovered that the therapy is based on exceptionally sophisticated observation, not only by means of vision but also to a surprising extent by using the sense of touch. It consists in essence of no more

⁷ Tinbergen (1973)p122

than a very gentle, first exploratory, and then corrective manipulation of the entire muscular system. This starts with the head and neck, then very soon the shoulders and chest are involved, and finally the pelvis, legs and feet, until the whole body is under scrutiny and treatment.”⁸

46. He goes on to say that between the three of them, his wife, his daughter and himself, they had already noticed striking improvements in high blood pressure, breathing, depth of sleep, overall cheerfulness and mental alertness, resilience against outside pressures, and also in such a refined skill as playing a stringed instrument

47. It meant that

...from personal experience we can already confirm some of the fantastic claims made by Alexander and his followers, namely that many types of under-performance and even ailments, both mental and physical, can be alleviated, sometimes to a surprising extent, by teaching the body musculature to function differently....Although no one would claim that the Alexander treatment is a cure-all in every case, there can be no doubt that it often does have profound and beneficial effects – and, I repeat once more, in both the mental and the somatic sphere.⁹

48. This is quite remarkable coming from a man who was receiving the highest honour in science from his skill in observing and interpreting animal behaviour.

49. He then says

The importance of the treatment has been stressed by many prominent people, for instance John Dewey, Aldous Huxley and – perhaps more convincing to us – by scientists of renown, such as Coghill, Raymond Dart, and the great neurophysiologist Sherrington. Yet with few exceptions, the medical profession has largely ignored Alexander – perhaps under the impression that he was the centre of some kind of ‘cult’, and also because the effects seemed difficult to explain.¹⁰

⁸ Ibid.123

⁹ Ibid.123

¹⁰ Ibid.124

50. This is still very much the position we find ourselves in today. The Alexander Technique is associated in the public mind with some rather odd viewpoints as you will find if you go into any large bookshop and ask where the Alexander books are kept.
51. But Tinbergen was no believer in cults; he was a straight forward scientist who had personally experienced the benefits of AT lessons and he was curious about what was going on at a physiological level.
52. He said:
- Once one knows that an empirically developed therapy has demonstrable effects, one likes to know how it could work – what its physiological explanation could be.¹¹*
53. He goes on speculate on how the AT might be linked with his own area of ethology and neuroscience. He says
- ...some recent discoveries in the borderline field between neurophysiology and ethology can make some aspects of the Alexander therapy more understandable and more plausible than they could have been in Sherrington's time.¹²*
54. He refers to the concept of *reafference* which was proposed by two scientists, von Holst and Mittlestaedt in 1950.
55. He goes on to say:
- There are many strong indications that ... the correct performance of many movement is continually checked by the brain. It does this by comparing a feedback report that says "orders carried out" with the feedback expectation for which, with the initiation of each movement, the brain has been alerted.¹³*
56. Once the brain gets the feedback that the action has been satisfactorily carried out, it can stop sending commands. This is the sort of task in which the cerebellum is involved.
57. Tinbergen then says:
- But what Alexander has discovered beyond this is that a lifelong mis*
- use of the body-muscles (such as caused by, for instance, too much sitting and too little walking) can*

¹¹ Ibid.124

¹² Ibid.124

¹³ Ibid.125

make the entire system go wrong. As a consequence, reports that “all is correct” are received by the brain (or perhaps interpreted as correct) when in fact all is very wrong. A person can feel at ease, for example, when slouching in front of a television set, when in fact he is grossly abusing his body.¹⁴

58. This is a neat scientific description or explanation of what Alexander described as faulty sensory awareness.

59. Tinbergen goes on to say:

In this short sketch, I can do no more than characterise, and recommend, the Alexander treatment as an extremely sophisticated form of rehabilitation, or rather of redeployment, of the entire muscular equipment, and through that of many organs. Compared with this, many types of physiotherapy which are now in general use look surprisingly crude and restricted in their effect – and sometimes even harmful to the rest of the body.¹⁵

60. Next week, I will look at what came next in the story of Tinbergen and the AT.

References

- W. BARLOW (1978) *More talk of Alexander* - Mouritz, (2005 edition), London
H. KRUIK (2003) *Niko's nature* - Oxford University Press, Oxford
N. TINBERGEN (1973) *Ethology and stress diseases: Nobel Lecture* - http://nobelprize.org/nobel_prizes/medicine/laureates/1973/tinbergen-lecture.html

¹⁴ Ibid.126

¹⁵ Ibid.127