

NO 31 DAVID GARLICK (red and white muscle fibres)

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1. Today, I would like to tell you about the late, and much lamented, Australian sports-medicine scientist and AT teacher David Garlick who died in 2002.
2. He was a well-known lecturer on the AT circuit of meetings and conferences. He visited the CTC numerous times and knew Walter, Dilys, Ruth, Alan and others. Everyone I have talked to about him remembers him as pleasant, lively and good-humoured. Another word I have heard used about him is “kind”.
3. He was born in Sydney in 1933 and qualified as a doctor of medicine in Sydney University and went on to get a PhD in 1963.
4. He then took a few years for study and research abroad. In 1970, he came back to Australia and took up a position in the Department of Physiology and Pharmacology at the University of New South Wales in Sydney.
5. He was always very keen on running and other forms of physical exercise and this, combined with his physiology work, began to lead him increasingly into the area of sports medicine.
6. He wasn't just interested in the research aspects of his work. He was also keen on educating doctors and health professionals dealing with sports medicine and he developed a Master's Degree course at the University of New South Wales which was aimed at clinicians. This was later expanded into an undergraduate degree course in Health and Sports Science.
7. His Alexander moment came in 1976 when he read Niklaas Tinbergen's 1973 Nobel Prize acceptance speech. The fact that an eminent scientist should use the occasion of being presented with the world's highest scientific honour to praise the AT caught his attention in a major way.
8. He was on study leave in London at the time and contacted Wilfred Barlow¹. In his own words

Dr Barlow wisely suggested I undertake lessons for two reasons – one was that I would benefit from it since my posture and the state of my muscles revealed there was room for improvement; secondly, the way to

¹ Wilfred Barlow was a medical doctor and specialist in rheumatology at the Charing Cross Hospital. He trained with Alexander and became a prominent Alexander teacher as well as continuing to work as a doctor. His book *The Alexander Principle* was highly influential in publicising the AT.

*understand the Technique was to experience it, not to observe it, since it deals with re-awakening one's muscle sense with re-programming one's muscle control.*²

9. He had frequent lessons in London which he continued when he returned to Australia “*becoming increasingly interested in the personal and scientific implications of the Technique.*”³ Eventually, like all of us here, he felt he needed more than just lessons and he decided to train as a teacher.
10. He joined the training course run by Kri Ackers who trained at the CTC in the sixties and is something of a legend among those who knew her. Garlick qualified as a teacher in about 1994. After he got his teacher's certificate, he continued to teach on a weekly basis at her school.
11. As a highly qualified medical scientist, with a research position in a major university, as well as an active involvement in a training course, he was uniquely well-positioned to carry out research into the physiology and neurophysiology of the AT. He did some which I will discuss but our regret is that he did not do more.
12. When he died of cancer at the age of 69 he was planning to investigate the effect of AT lessons on the multifidus muscle which runs right down the spine. It connects up the spinal vertebrae and is deeply involved in posture. It would have been very interesting to see the results if this project had gone ahead. His death was a considerable loss to the AT community.
13. His published AT work is fairly thin. His main publication is a booklet published by the University of New South Wales in 1990 called *The Lost Sixth Sense: a medical scientist looks at the Alexander Technique*. This was published before he became a teacher and is the nearest thing we get to an overview of the AT from the Garlick perspective.
14. The lost sixth sense in the title is “proprioception” – the internal sense or awareness that the body has of itself. It tells us where the bits of our body are in relation to each other. It also tells us when we are tired or tense, whether we are

² Garlick (1990)p5

³ Ibid.p5

carrying a heavy or a light load, whether we are still or moving – and so on.

15. One way of thinking about proprioception is that it is about the sense of the internal state of the body as opposed to the other five senses: sight, hearing, smell, taste and touch which tell us about external objects.
16. Proprioception is often used interchangeably with kinaesthesia. Sometimes, they are distinguished, with proprioception referring to the sense of the position of the various bits of the body and kinaesthesia referring to a sense of the body in movement.
17. Garlick says that in modern life we are tending to lose our proprioceptive sense. He says
*...our minds become so occupied with so many inputs and outputs to do with the outside world that signals from the body are suppressed or “gated out” before reaching consciousness.*⁴
18. This, of course, is very much what Alexander was saying in his own day when he talked about our faulty sensory perception. In CCCI, he talks of our *“debauched kinaesthesia”* and our *“unreliable and delusive sensory appreciation.”*⁵ We literally do not know what we are doing to ourselves as we go about our daily activities.
19. *The lost sixth sense*, in my view, is a very nice introduction to the physiology and neurophysiology underlying the AT. If you have forgotten or never knew about the workings of the flexor and extensor muscles, the role of muscle spindles, tendon organs, joint receptors and such, it presents the basic facts in a succinct and accessible way.
20. It also provides a useful neurophysiological perspective on important AT concepts like inhibition, direction and primary control. If you are trying to explain these to someone with a medical background, Garlick’s way of looking at them can provide a bridge between the world of medical science and the AT.
21. The only other published source of his work that I know is a series of about 20 articles which he wrote for the AT magazine *Direction* over the period 1988-2002. The earliest of these were

⁴ Ibid.9

⁵ Alexander (1923) p60

written before he began to train as a teacher but he continued to produce them after he qualified right up to his death in 2002.

22. They are all quite short and give you bite-sized portions of insightful neurophysiology. I very much like them.
23. One of the themes that comes up in Garlick's work is the difference between red and white muscle fibres. These are sometimes referred to as Type I and Type II fibres.
24. Different authors subdivide them further. But for our purposes we will simply talk of red and white fibres while bearing in mind that there are intermediate types which have some of the characteristics of both.
25. The red fibres are smaller in diameter and weaker than the white. Their red colour comes from a substance called myoglobin which is an oxygen-carrying protein. When you see the prefix "my" or "myo" in physiology it usually means it is connected in some way with muscle.
26. Both types of muscle fibres use a chemical called adenosine triphosphate (ATP) to do their work.
27. In the case of the red fibres the normal blood supply to the muscles brings them the raw materials they need for making their ATP. It also carries away the waste products from making and using this ATP.
28. The blood is carried back to the lungs for renewal in the normal breathing process. This is why the energy process going on in red fibres is often described as aerobic.
29. The most important consequence of this is that as long as the activity of the fibre does not exceed the capacity of the bloodstream to bring in the raw materials and get rid of the waste products, these muscle fibres can keep going indefinitely. This is why they are called non-fatiguable – they do not get tired.
30. They are also relatively slow to act which is why they are often called slow, or slow twitch, fibres. They are the ones best suited for gentler activities like standing or sitting and for slow, rhythmic activities such as walking and jogging.
31. These are also the muscle fibres that athletes rely on for endurance events like the marathon. Because these fibres are small in diameter, endurance athletes tend to be fairly slim in build. Look at the Kenyan and Ethiopian distance runners

32. Now the white muscle fibres. They are low in myoglobin which is why they are whiter than the others. They are also quicker to act. They are sometimes referred to as fast-twitch.
33. They are adapted for movements which require speed and strength like leaping up a tree out of the way of a lion, sprinting, and explosive actions like weight-lifting. They are larger in diameter than the white fibres and it is these that give sprinters, weight-lifters, and body-builders their big bulging muscles.
34. The energy supply for these fibres is managed in quite a different way from the red fibres. When they are not working, they accumulate a substance called glycogen which they are able to turn into ATP very quickly. They rely on their stores of this stuff for the production of ATP when they need it. Because this process does not rely on oxygen from the blood supply it is usually described as anaerobic.
35. Muscles relying on white fibres can keep going for a maximum 30-40 seconds of flat-out activity in the case of top-class athletes⁶ and in ordinary people it is more like 10-20 seconds. After that, fatigue sets in as a result of the depletion of glycogen and the build-up of waste products, principally lactic acid, in the fibres.
36. Most muscles have a fairly even balance between their red and white fibres. This means that, for example, our arms and hands can be used for gentle activities like stroking the cat or trying to cause brain damage to the other fellow in a boxing ring.
37. But some of the important postural muscles like the multifidus and the gastrocnemius in the calf – have a higher proportion of red fibres than the other skeletal muscles.
38. The next question is how does all this work? What decides which fibres will be called into action at any given moment? Physiologists call the process *fibre recruitment*.
39. The answer is that fibre recruitment is a mixture of the automatic or reflex, and the voluntary.
40. At a reflex level recruitment happens according to need. If low force is needed, then red fibres will come into action; if a bit more force is required, some white fibres will come into action;

⁶ Tortora (2000) p283

and if maximal force is needed, more of the white fibres will come into action.⁷

41. But habit or intention can interfere with the working of the reflex system. If we habitually tighten ourselves up and rush into doing things, we tend to recruit white muscle fibres. David Garlick points out the telling fact that when the neck muscles are tightened or contracted, there is a tendency to mobilise white rather than red muscles for posture and simple movements.⁸
42. We can also see that modern life is extremely conducive to mobilising the white fibres. Working in a stressful job, sitting at a computer getting into a state about e-mails, struggling with traffic or public transport, tends to make people mobilise their white fibres. If we go to the gym for a vigorous work-out at the end of the day, this tends to mobilise and exercise the white fibres.
43. So the kind of life we lead tends to encourage an imbalance between the red and white fibres. Once this begins to happen, we can find ourselves in a cycle of deteriorating use. This is because the unused red fibres start to atrophy, leaving us increasingly dependent on the fatiguable white fibres for sitting and standing. And because this causes us tiredness and pain, we start using props and supports for our back which means the red fibres are used even less and we are led deeper into a self-reinforcing cycle of misuse.
44. This why many people in offices, despite the fact that they go regularly to the gym, find they are unable to sit unsupported in a chair for more than a few minutes. They wind up using “ergonomic” chairs with lumbar supports which further weaken their back muscles.
45. The way to avoid this cycle of deteriorating in our musculature is exercise. But it has to be exercise which gives us the right balance between the red fibre muscles and the white-fibre muscles.
46. I looked up a book called *Foundations of exercise science* edited by Professor Gary Kamen of the Department of Exercise Science at the University of Massachusetts.
47. He says:

⁷ Ibid.290

⁸ Garlick (D1-1)p7

...it's not easy to design an all-purpose exercise program that would provide optimum benefit to both aerobic and anaerobic performance systems.⁹

48. But for ordinary health and well-being he says:

...very easy exercise (low intensity and short duration) can make the biggest improvements in the health benefits of exercise...the benefits plateau at 50% intensity and 30 minutes duration. Exercise of greater intensity or longer duration provides little additional benefits to general health.¹⁰

49. Regular walking is probably the best exercise regime one can adopt.

50. People do, of course, want or need to do things which require quite heavily developed muscles systems. You cannot be a scaffolder or wrestler without developing quite a lot of specialised muscle bulk. But it is important to distinguish between being fit for a particular purpose and being healthy.

51. We need to recognise that many of the athletic and fitness goals that people set themselves are often damaging to overall health. Big over-developed chest muscles, for example, tend to interfere with breathing and can cause lumbar area problems.

52. But whether we are looking at being generally healthy or developing specialised muscle systems, we find the AT is extremely relevant and that science is on our side.

53. For example when we are standing, if we allow it to happen in a properly released way, rather than trying to hold ourselves up with our shoulders, the nervous system tends to recruit red fibres to do the job. If you like, we are ensuring the proper allocation of activity between the red and white muscle fibres in our body.

54. This ties up nicely with Walter's observation that the function of the AT is to create the conditions under which the autonomic, or reflex system, can get on with its job – which is mainly done by the red fibres. He also used to say that Alexander made a point about his lack of muscle bulk, especially the fact that he did not have big biceps.

⁹ Kamen (2001)p46

¹⁰ Ibid.73

55. And even if we decide we want, or need, to develop ourselves in ways which require big white-fibre muscles, the Technique is still relevant. By getting ourselves into an Alexandrian state of balanced non-doing before we start our activity, we ensure that it will not be entirely at the expense of our red fibres. We will ensure that our muscle fibre recruitment maintains the best possible balance, in the circumstances, between our red and white muscle fibres.
56. So David Garlick has plenty of words of wisdom for us. But there is, for me, a real sense of incompleteness about his work. Perhaps, if he had lived longer he would have been able to weave the pieces into a more satisfying big picture. But that said, I think what we have is extremely valuable.
57. I would also mention that Paul Cook, the last editor of *Direction* has been putting in massive efforts to keep it going as an on-line journal. One of the things he has done is put all David Garlick's pieces into a special issue of *Direction* which you can get from him. I don't think anyone can go through these pieces without gaining a variety of new and valuable insights into the workings of the Technique.
58. The address of Paul's website is www.directionjournal.com

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