

No 20 GEORGE ELLETT COGHILL (II)

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1. Last time, I told you about the life of the American scientist George Ellett Coghill. His special study was a small American amphibian, or froglike creature, called *Amblystoma*.
2. He was well-known for an amazing series of experiments he carried out on the very early stages of the development of the nervous system in this little animal.
3. I especially recommended Walter's little book in which the section called *The foundations of human well being* – in which he compares Alexander and Coghill is very good.
4. The question I particularly want to look at today is what exactly it was about Coghill's scientific discoveries that made him feel he and Alexander were on exactly the same track.
5. On the face of it, the study of the neuromuscular development of tiny newts from the time of their hatching through the 60 hours up when they are able to swim around purposefully does not tell us a great deal about the theory or practice of the Alexander Technique as a means for psycho-physical re-education of fully grown human beings. But this is exactly what Coghill believed.
6. The fact is that despite the fact that he had devoted forty years of his working life to the study of *amblystoma* Coghill was far more than a dull scientific technician. Like Sherrington and Magnus, he was in pursuit of much higher things.
7. I mentioned in the previous talk that after he had left theological college, he had decided on a new life-project which was to

...carry out a systematic investigation of the natural history of the human mind by application of scientific method to psychological problems, with the hope of ultimately reaching a satisfying naturalistic philosophy.¹
8. He also said that through all his research work, his main interest was in "*the nature and interrelation of sensation, perception and thought.*"²
9. So this broader picture was always in his mind when he was carrying out his research and his biographer says that

¹ Herrick (1949)18

² Coghill (1929)v

*...his work for many years received more attention and had more influence among psychologists than among his colleagues in biology.*³

10. He had actually made notes and drawn up the outline of a book which he intended to call *Principles of Development in Psycho-organismal Behavior* but he died before he had got anywhere in writing it.
11. The word behaviour keeps coming up and it is important to be clear about what Coghill meant by it. It does not have the moral connotation that we sometimes give it in expressions like *good or bad behaviour*. Coghill used it in the technical sense of how an organism responds to internal or external stimuli.
12. He said himself
*It seemed to me basic to a scientific study of behaviour to know whether the behaviour pattern of an animal develops haphazard or in an orderly manner; and that, if it should be found that behaviour develops in an orderly manner, then there should be a corresponding order of development structurally and functionally in the nervous system.*⁵
13. At the time Coghill was carrying out his research, in the early decades of the 20th century, there was still quite a lot of argument about how the nervous system developed in the early stages of the growth of living creatures. Many scientists, for example, believed that the various stimuli to which creatures happen to be exposed to in their early development have a major impact on how their nervous systems and patterns of behaviour develop.
14. One of the key conclusions Coghill reached from his work was that this was not the case. He said
*Behaviour develops from the beginning through the progressive expansion of a perfectly integrated total pattern and the individuation within it of partial patterns which acquire various degrees of discreteness.*⁶
15. In other words, even at the very earliest stages, there is an overall unity and pattern in the development of the nervous system which determines the behaviour of the animal.

³ Herrick (1949)168

⁴ Ibid. p229

⁵ Coghill (1929)vi

⁶ Ibid. p38

16. Coghill was working on amblystoma, which is a very simple little creature but he said it exemplifies a principle of organic unity which is there in all vertebrates.

*This principle is thoroughly demonstrated for Amblystoma, a typical vertebrate, and there is nothing in our knowledge of the development of behaviour to indicate that the principle does not prevail universally in vertebrates, including man. There is no direct evidence for the hypothesis that behaviour, in so far as the form of the pattern is concerned, is simply a combination or co-ordination of reflexes. On the contrary there is conclusive evidence of a dominant organic unity from the beginning.*⁷

17. He goes on to say.

*...the nervous system concerns itself first with the maintenance of the integrity of the individual, and only later makes provision for local reflexes.*⁸

18. In other words, there is a fundamental unity in the organism from the very beginning. Coghill called this “*the total pattern*”.

19. Different creatures obviously have different total patterns – dogs develop in different ways from cats or amblystoma. But in each kind of creature, the particular nervous equipment required for its own characteristic behaviour begins to come into being before the muscular equipment for activating these behavioural patterns has fully developed.

20. His original question had been about how does behaviour develop? His answer was that the behavioural pattern is there from the beginning – just as the pattern of the final plant or tree is in the seed.

21. The embryonic nervous system grows into this characteristic – we would probably now say, genetically determined – pattern. But interestingly Coghill sees this growing into its inherited pattern not as being restrictive but as creating wider possibilities of action for itself.

22. His analysis of how this happens in practice is really quite interesting. He says during the development of the organism, the nervous system indulges in what he calls “*forward reference*” and at any given stage in development there is a

⁷ Coghill (1929)p 89

⁸ Coghill (1929)89

“overgrowth of neural mechanisms beyond the capacity of the animal to express their full nervous potential in behaviour.”

23. In other words, at each stage in development, the nervous system extends itself beyond the muscular capacity and skill of the moment – this is what he means by neurological overgrowth – and it is because of this that the developing creature becomes able to do new and different things.
24. Even the simple little amblystoma, as it develops, acquires new capacities and therefore has an increasing range of possible ways of responding to different stimuli.
25. The more complex the creature, the greater the range of its potential utilisation of this neurological overgrowth. A cat, for example, because of this overgrowth of neural mechanisms is able to behave differently depending on the environment in which it finds itself.
26. In the wild, for example, it has the capacity to do what is necessary to find food, protect and reproduce itself. But if it grows up in a cat-loving family, and is neutered at the vet, and is equipped with a collar and a bell, and a magnetic key to the cat-flap, it has the capacity, by utilising its neurological overgrowth in a different way, to develop a totally different pattern of behaviour – thinking it is the boss of the house, for example.
27. There is, therefore, a certain degree of freedom within the constraints imposed by the total pattern. The way Coghill puts it is that the organism

*...grows according to its own intrinsic pattern. Within the limitation of this intrinsic pattern of growth it is autonomous both in its reaction to its environment and its action upon its environment; and in this autonomy is the natural source of initiative or freedom in behaviour...*¹⁰

28. This is fairly deep stuff. Coghill is saying that freedom emerges from the process of growth. The neurological system develops in advance of the muscular capacity for action but as the muscular system itself develops, the overgrowth in the nervous system provides it with an expanded possibility for action.

⁹ Ibid. p92

¹⁰ Herrick (1949)222

29. Coghill goes on to talk of this as a dynamic system in which in which

...may be found, I believe, a natural basis for the interpretation of reflexes and instincts, and for that individual initiative, autonomy or freedom which appears to be essential to psychology and sociology as sciences.

30. Elsewhere, he says

...man is, indeed, a mechanism, but he is a mechanism which, within his limitations of life, sensitivity and growth, is creating and operating himself.¹¹

31. Coming a bit more down to earth, more the engineering than the philosophical level, Coghill has some very interesting things to say about how a neuromuscular organism, whether amblystoma or a human being, manages to do the things it does. He is particularly interesting on the question of inhibition.

32. Taking the example of when we use a particular part of the body, say the arm, to do something. He says

The major division of the total pattern must be under inhibition when a part acquires independence of action, and the same part can be inhibited while the major segment of the total pattern acts. So that the whole individual probably acts in every response, either in an excitatory or inhibitory way.¹²

33. This takes us back into Sherrington territory, in which he said that *inhibition is co-equally with excitation a nervous activity*. So when we are doing something with a part of the body, we are sending excitatory signals to the muscles which are doing something, while at the same time sending inhibitory signals to the rest of the body.

34. It basically means that if you are going to wave your arm about, the neuromuscular system needs to inhibit the bits of the body which are not part of the arm movement. In the extreme case, if this does not happen, the whole of the body simply flops about in a completely uncoordinated way as can happen in various muscular or nervous disorders.

¹¹ Ibid. p222

¹² Ibid. p121

35. We often explore this in our games – making sure when we do something simple like lifting an arm or going into monkey that we are inhibiting any unnecessary use of the various other groups of muscles not involved in the action. I think somebody called it “conscious control”.

36. This is why Sherrington says

*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.*¹³

37. So from the AT perspective, we find a perfect link-up between Coghill who was looking at the early development of behaviour and Sherrington and Magnus who were looking at behaviour in mature animals. One might say that they take over the analysis where Coghill leaves it off.

38. But coming back to Coghill, the important thing is that he had fully grasped what Alexander was about and was deeply impressed. This is something else Coghill wrote to a colleague about Alexander

*Mr Matthias Alexander owes me nothing in regard to the principle of the “total pattern” for he and I worked in total ignorance of each other until the last year or two. That he should discover the principle in the human organism is marvellous, and he deserves all the credit that the medical profession and humanity can give him.*¹⁴

39. So given that Coghill was a major scientist who understood and had experienced the AT, I think it is well worth looking seriously at the Appreciation he wrote at the beginning of UCL.

40. He begins it by saying that the Technique is based on

...three well established biological principles: the integration of the whole organism in the performance of particular functions; proprioceptive sensitivity as a factor in determining posture; and the primary importance of posture in determining muscular action. These principles I have established through forty years

¹³ Sherrington (1946)p89

¹⁴ Alexander (1946)p114

*in anatomical study of Amblystoma in embryonic and larval stages, and they appear to hold good for other vertebrates as well.*¹⁵

41. Towards the end of his Appreciation he says something extremely interesting

It is my opinion that the habitual use of improper reflex mechanisms in sitting, standing and walking introduces conflict in the nervous system, and that this conflict is the cause of fatigue and nervous strain, which bring many ills in their train.

42. Here, he is obviously using “reflex” in the sense of a cultivated or acquired habit which has become automatic, rather than the innate response meaning which Sherrington gives it.

43. What Coghill basically means is that when we get into habits of using ourselves which are in conflict with the innate total pattern this brings about fatigue and nervous strain.

44. Coghill then goes on to say

Mr Alexander, by relieving this conflict between the total pattern which is hereditary and innate and the reflex mechanisms which are individually cultivated conserves the energies of the nervous system, and by so doing corrects not only postural difficulties but also many other pathological conditions that are not ordinarily recognized as postural...

45. He goes on to say

*Mr Alexander's method lays hold of the individual as a whole, a self-vitalizing agent. He re-conditions and re-educates the reflex mechanisms, and. I regard his methods as thoroughly scientific and educationally sound.*¹⁶

46. So there is plenty of food for thought here. The total pattern and the organic unity which Coghill had identified from his experiments are scientific expressions of the psychophysical unity of the individual on which Alexander insisted throughout his teaching and in his writings.

47. When we look at the state of ourselves and our pupils, it is easy to get drawn into looking at the specific things that are

¹⁵ Ibid. p xix

¹⁶ Ibid. p xxiv

wrong – a frozen shoulder, a tension headache, a chronic habit of tightening the throat, a lower back pain. We look for cures: six Alexander lessons for lower back pain.

48. What Coghill is saying is that we need to look to the total pattern. If we are misusing our back, we need to bring its use back into its proper or normal relation with the functions of organism as a whole.
49. This is what lies behind much of Alexander's criticism of the conventional medical approach. Doctors do not, of course, deny that the body is a unity but in practice, they usually act as though we composed of bits which can be looked upon in isolation.
50. We have the same thing with exercise programmes which are devoted to strengthening various muscle groups without making sure the overall musculature is functioning as effectively as it should. We find people going to the gym and strengthening the very muscles which are causing them lower back pain or preventing them breathing easily or using their voices properly.
51. As I said last time, Coghill has been a somewhat neglected figure in AT thinking but the fact that Alexander got him to write the Appreciation, and that Walter put so much work into studying him and writing about him makes me feel he is well worth thinking about seriously.
52. Finally, a little anecdote from Walter's *A time to remember* in which he recounts that when Coghill was talking to Alexander he compared their two lives. Coghill said that he as a healthy young man had devoted his life to science and had ruined his health peering through a microscope to find out the principles which Alexander as an unhealthy youth had discovered by looking in a mirror and used them to improve himself and live to be the healthy 72 year old that Coghill had got to know.¹⁷

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¹⁷ Carrington (1996)p50

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