**Adapting our Language: The Problem (?) of Teleological Language in the Philosophy of Biology [[1]](#footnote-1)**

I take the problem of teleological language in Biology to be twofold. Firstly it can make problematic communication between those who are (broadly speaking) experts in biology, and those who are not. In order to explain the theories they aim to the expert must take one of two approaches; neither of which is foolproof. Either they must describe their theory in layman’s terms only or else do their best to make the language they use comprehensible to an audience with no prior experience of it. In this second case, whilst the *words* that the expert employs may be familiar, their particular *use* in this context is likely not to be. This is the root of our first problem.

Secondly, the use of teleological language within Biology proves problematic if it is assumed that this necessarily brings with it certain theoretical as well as linguistic baggage and that we must take steps to counter any embodiment of teleological thinking. I am going to suggest today that some of the disagreements we encounter in the Philosophy of Biology can be resolved by accepting that we are not engaged in a competition for the prize of establishing the *true* meaning of the words we use. This competition falls foul of the fallacy that there is (and must be) something to which expressions such as ‘the meaning of the word x’ refer.[[2]](#footnote-2) This is the root of our second problem.

I believe that the way forward suggested here both addresses and crucially can help to dissolve *both* of these problems. Turning from the meaning to the use of words allows us to see that there are various legitimate technical and non-technical uses of the one word each of which should be taken to carry with it only its particular baggage. Once we do this we can share the responsibility of making clear which use is in play and spend our time on genuine philosophical and biological problems instead of either identifying and resolving linguistic confusions or boxing at shadows.[[3]](#footnote-3)

**Problem 1 – The problem without**

We tend to assume that the danger for most technical subjects is not of their terms of art being used differently in non-technical spheres but of their being misunderstood whist subject to correction. For example imagine a scenario where the scientist, surprised by a non-scientific use of ‘photosynthesis’, is thus obliged to turn to the way the word is used in everyday conversation in order to find out what is *really* meant by the term or to check his theories against this use of the word.[[4]](#footnote-4) In the case of obviously technical language the absurdity of this seems clear enough. However not all scientific language *is* obviously technical and this is one of the causes of our first problem with the use of teleological language in Biology.

Biologists know that adaptation may be conceived in a variety of ways. They also know and can take for granted that

i) those who work in this area make several different uses of ‘design’ and design- and/or function-based descriptions and examples in their work

and

ii) that these various uses may or may not depend upon or reflect a prior adoption of a particular understanding of adaptation.

Experienced readers can read these *in* to a text as well as reading them *out* of it.

The existence of these various potential readings is thus not a problem in and of itself; it becomes a serious problem if an audience is not aware of these distinctly technical uses and reads those words in any article as if they were used in an entirely ordinary way where that is not the intention of the author.[[5]](#footnote-5)

This is particularly bothersome as non-technical language is basic to technical language.[[6]](#footnote-6) We constantly rely on language which we are likely to have acquired a long time prior to our acquiring our technical vocabulary(/ies); this may make it especially hard for us not to import some of these non-technical aspects of the words we use into our technical use, consciously or not, even when we are aware of these differences. It can also be hard not to fall back in to the comfortable assumption that what people generally mean by x is what technicians (even in their various stripes) must generally mean.

Where we add to this unfamiliar short-hand, non-obvious metaphorical uses[[7]](#footnote-7), and analogies which can be meant either descriptively or diagnostically[[8]](#footnote-8) it should be no small wonder that sometimes the use of teleological language in Biological texts is misunderstood by non-Biologists.

This need not be seen as an *entirely* linguistic problem. One explanation for some of these misunderstandings may be the tendency to think of biology as simply one ‘part of’ science amongst similar others. Here science is conceived of as a particular task with particular goals; the only difference between the branches being that they aim to ‘do’ science on different topics. This suggests that ultimately the physicist’s task is the same as the chemists is the same as the biologists; the only difference between them is their particular area of interest. This is, of course, not simply the case and there are good reasons to be sceptical of this characterisation particularly when it comes to biology.

This characterisation of science may lead audiences to lower their guards and read uncritically as it reflects a belief that the task of science is to tell us straightforwardly what is (or what is not) the case.[[9]](#footnote-9) Thus the existence of non-literal language and the use of models and representations as such can all too easily be forgotten.

We can, for example, forget that to move from the ‘cooperation’ of genes to the ‘cooperation’ of people is not simply an unproblematic case of scaling up from the genetic to the social level. Rather ‘co-operate’ may be used, perfectly legitimately, in both a mechanistic and a social-interactive sense. An opposite conclusion from a similar misunderstanding occurs when genetic determinism and the impossibility of altruism is read, and readily accepted, from a glancing acquaintance with the spine of *The Selfish Gene*.

When we make the move away from seeing ‘science’ as a whole with rules and methods which necessarily operate across the distinct disciplines as parts of a whole we can perhaps more easily accept that not only do the different disciplines have not only their own technical terms and technical uses of non-technical words but that the sub-disciplines within these make their own particular demands upon the language they use.

**Problem 2 – The problem within**

Perhaps, then, we now have the beginnings of a response to our first problem. We haven’t however considered our second yet, though I think in the above we also have the beginnings of our response to this too.

Why is the use of such everyday words as ‘design’, ‘for’ and ‘function’ considered problematic within biology? It seems that these words carry with them, even for those aware of their particular technical uses, the double shadow of their everyday uses and the history of teleological thinking in biology. As Young states ‘…we remain men and not supermen: we must use the natures and habits that we inherit, including those of language.’[[10]](#footnote-10) In the case of the biologist the habits of language include the pre-technical as well as the technical uses of the words they employ and encounter. They also include the habits of history.

Where the technical and non-technical uses of words seem to be in conflict we may seem to have only two alternatives available to us, either

i) we must remove the technical use as the conflict shows it must be wrong

or

ii) we conclude that what we are lacking is a *true* or *good* definition of the word.

These are the lines along which battle is usually drawn in this debate.

These are then the possible conclusions for those who want to retain teleological language as it is thought particularly apt for dealing with the particular problems the biologist tackles

i) though it may be strictly speaking wrong we should keep it as is and do our best to minimise the confusion it may cause

or

ii) the teleological language we use now is in need of refining to better reflect the fact that it does not necessarily imply teleological thinking.

In the final section of this paper I will argue that these are not the only options available to us, as they are what we have to hand now however let us see what merits they may have.

Solution i. is simple but problematic; these problems are perhaps best drawn out in contrast with the solution I want to offer in what follows so we will put this on the back-burner for now.

As an example of solution ii. Ernst Mayr[[11]](#footnote-11) attempts to negotiate[[12]](#footnote-12) the ‘problem’ of teleology in Biology by identifying and analysing ‘five different meanings of the highly heterogeneous term teleological.’[[13]](#footnote-13) This is certainly one way around the problem. If the language we use causes confusion then we can introduce new terms which are supposed not to carry with them the unfortunate baggage of the old. In doing so we can bring to light the disparate concepts previously, and erroneously, lumped together. In this way, it is argued, we can keep the useful elements of teleological language without ‘being vulnerable to the traditional objections’ that this language is necessarily (if sometimes covertly) intentional.[[14]](#footnote-14)

Scientists and Philosophers do seem to have a particular freedom in coining new technical terms compared to some disciplines, such as the law, which cannot throw off the long history of the terms they employ.[[15]](#footnote-15) It is then possibly remiss of them not to exercise this freedom where it will reduce confusion. Even perhaps if this is only the confusion of an audience they do not always intend to address.

However, whilst Mayr’s analysis is a nice piece of clarificatory work and may produce some more helpful terms for biologists it is not obvious that this move will be successful in satisfactorily answering critics of teleological language or removing the problem of potential miscommunication.[[16]](#footnote-16)

Though the umbrella terms are altered individual instances of ‘teleonomic’ language (for example) will be identical to the teleological. Therefore the words we use will remain those whose seeming familiarity causes confusion. Whilst we may stumble over, and right ourselves after, coming across obviously technical terms such as ‘teleonomic’ (and indeed ‘teleological’) we do not so stumble over words like ‘designed’ or ‘programmed.’ Furthermore, the problem for those who object to teleological language was never with the ‘logos’ and always with the ‘telos’; which is retained here.

In this case, we also have the complication of Williams and others adopting the term ‘teleonomic’ from the same source as Mayr (in Pittendrigh) and using it in different ways, some rather more in keeping with the original than others.[[17]](#footnote-17) This opens the door to those who may want to say that this shows some or all of these authors must be wrong in their use of teleological language.

This course seems even less favourable when we are aware that there exists a simpler way to reconcile the concerns of those who oppose any and all uses of teleological language on both the traditional grounds that it is necessarily intentional and is likely to lead to confusion with the concerns of the biologist and that is for us to accept that there can be various ordinary uses of even the most everyday terms. Some of these ordinary uses are technical uses.

**A way to dissolve (some of?) the problem**

In order to explore how we can avoid some of the problems which arise with the varying uses of teleological language I want to borrow from and build upon Ryle’s work. Ryle shows that concepts such as ‘warmth’ and ‘thermometer temperature’ are not rivals in order to examine the relation between the scientific and the everyday view of the world.[[18]](#footnote-18) The important message for us to take from this is that these two concepts, though different, are not rivals.[[19]](#footnote-19) We can operate perfectly legitimately with either of these, which we do use will depend upon context.

Ryle also shows that there may be ‘non-stock’ but, in their own way, perfectly ordinary uses of everyday words.[[20]](#footnote-20) ‘Non-Stock uses of a word are, e.g., metaphorical, hyperbolical, poetical, stretched and deliberately restricted uses of it.’[[21]](#footnote-21) These non-stock uses of the word are not in conflict with the stock. My using my hammer to smash a plate does not rival my use of it at another time to hammer in nails.

We could object here that in potentially describing teleological language in biology as a ‘stretched’, ‘poetical’ or ‘metaphorical’ use we are stating exactly why this should not be used and doing our opponents work for them. This objection will only be well received by an audience unwilling to think of scientific writing as anything but literal. Which, we have already seen, we have good reason to doubt as wrong-headed. We can thus conceive of the varying uses of teleological language within and with-out biological literatures in much the same way we think of these non-rival concepts and non-rival uses.

Ryle (ever fond of card game analogies) uses the various properties of the Queen of Hearts to illustrate his point in *Dilemmas*.[[22]](#footnote-22) The Queen of Hearts has different properties dependent on the game underway.[[23]](#footnote-23) The Poker player and the Bridge player use this same card differently. This does not mean that either the poker or the bridge player has a greater knowledge of the properties of the card. Nor importantly does one use the card correctly whilst the other misuses it for the purpose of their game.[[24]](#footnote-24) What they each do is imbue the card with the properties relevant to the game they are playing.[[25]](#footnote-25)

We can of course be ignorant of the rules of bridge and/or poker and thus miss the various properties a card may have whilst recognising the card as a Queen of Hearts, or even simply recognise it as a playing card whilst being unable to identify the suit or the value of a ‘Queen’ as compared to a Jack or King.[[26]](#footnote-26) This is in common with the fact that we may recognise teleological language when we come across it in biology whilst not realising that such language has particular uses or properties in this context, as it also has in, for example, the context of various philosophical sub-disciplines.[[27]](#footnote-27) If we get to grips with the terms used and the conventions for their use then we are no longer in the position of the aspirant but ignorant card player.

Teleological language is then like the Queen of Hearts in this respect: how we may use it and how we should understand it depends upon the context in which it is used. Teleological language may be ‘biology-laden’, ‘philosophy-laden’ or laden with the conventions of any other area in which it is used. It is not ‘laden’ with one meaning which it must carry with all and every usage.[[28]](#footnote-28)

In order to show how differing uses need not be rivals in a more directly relevant case we can turn to Dupré’s work on ordinary language and taxonomic classifications in biology. These two are contrasted by the functions they serve,[[29]](#footnote-29)and not by any deep rivalry between them. Ordinary language classifications tend to occur because they are useful for us.[[30]](#footnote-30) We should not expect to find that these distinctions echo those of scientific taxonomy as these activities are not of interest to the scientific taxonomist as such.[[31]](#footnote-31) The same goes for scientific taxonomies for those operating with ordinary language classifications.[[32]](#footnote-32) Further distinctions are made by those whose specific tasks require them to have such distinctions at hand. These distinctions need not coincide with either the ordinary or the scientific classifications nor need be thought of as in any way in competition with them.[[33]](#footnote-33) The language of the timber merchant is suited to their tasks as the language of the biologist is suited to their tasks. They should not be taken as suited to each other’s tasks.

This brings us to the place where it is useful to draw our contrast between the solution offered here and that suggested in solution i. that we keep teleological language as, though strictly speaking mistaken, it is useful to biologists. In our solution, the use is *different* not mistaken. This is important as, whilst a word may be misused in many ways, there are limits to how it may be used successfully.[[34]](#footnote-34)

If we adopt the solution offered here we do not lose the ability to see that conventions of use exist and are adhered to as we must in adopting solution i. The timber merchant needs to use the terms specific to their trade correctly in order to trade successfully. The rules of bridge are conventional; that these and only these rules apply once the game is under way is not.[[35]](#footnote-35) We can go wrong in technical uses of seemingly non-technical words just as we can in using straightforwardly technical and non-technical language.

Here we encounter an obvious problem. Though we can easily go to a rule book to familiarise ourselves with the rules of various codified card games, we cannot always do this for technical uses.[[36]](#footnote-36) Often we will ‘have to read the unwritten codes of their conduct out of their conduct.’[[37]](#footnote-37) Unless uses are made explicit we have no way of checking that our reading is correct other than through ensuring internal consistency and having some grasp of the field in which a particular piece is located.[[38]](#footnote-38) Only once we are aware of the rules that should be being followed can we be prepared to spot genuine novelty and innovation as well as mis-uses.

Therefore, when Dawkins claims that he does not talk about ‘genes for’ in a particular, determining causal sense[[39]](#footnote-39) and E. O. Wilson claims that biologists ‘...do not, except in laboratory shorthand, speak of a gene “causing” a particular behaviour, and they never mean it literally’ we should take them at their words and read what they have to say accordingly.[[40]](#footnote-40) If in doing so we discover that their claims are not realised in fact then we have ample grounds to criticise them for not playing by the rules they should.[[41]](#footnote-41) What we should be interested in at this point is, to repeat, internal consistency, not checking that the ‘one true meaning’ is in play.

To say all of the foregoing is not, of course to say that ordinary uses are fixed.[[42]](#footnote-42) Indeed Ryle singles out the technical terms of genetics as an example of the way that the ‘special terms of a science’ (and note the ‘a’ here) are theory-laden. This not only means that they come with ‘the luggage of genetic theory’ but also that ‘...their meanings change with changes in the theory.’[[43]](#footnote-43) It is important for us not only to know that technical terms exist but also to have some appreciation of the history of these and their fluid nature in some cases. Knowing the theoretical baggage of teleological language is then less a problem than a way to understand the history of biological terms and concepts. Knowing this history, and knowing it well, should help us to separate teleological language from teleological thinking in our minds.

‘Genes’ do indeed seem to be an ideal illustration of this fact and of the way technical terms operate over time.[[44]](#footnote-44) It is not simply the case that words fall out of use as theory changes. Some, of course do, ‘Phlogiston’ for well-rehearsed example. Some do not.[[45]](#footnote-45) The fact that phlogiston is such a standard example does perhaps hint that it is an illustration of the rare case.

Dupré seems to suggest something similar, stating that

Traditional philosophy of science sees central concepts as opening up the possibility of discovering laws of nature or, at any rate, general knowledge of nature. The example of genes suggests something quite different: the function of this concept is rather to allow us to talk about lots of different things. Such a concept facilitates communication between people with different but related concerns and facilitates continuity between successive historical inquiries. It may also provide the risk of serious misunderstanding. The risk is probably minimal in the case of working scientists communicating their results to one another, as far more specific, local interpretations of a word such as “gene” will be expected and provided. Misunderstanding arises rather as scientific results disseminate to different areas either of science or to other domains of human life, and such dangers may be exacerbated by obsolete philosophy of science.[[46]](#footnote-46)

The problem of teleological language may then have no one simple solution. It may also not be problematic in the simple ways it may have been thought to be. If this is the case then our two earlier solutions may well not be up to the job.

**Conclusion**

So, to conclude, I want briefly summarise my main points here. Firstly: understanding scientific terms and scientific uses of everyday language is not a simple case of having a definition of the term or knowing how to use that language in an everyday way. Rather it is knowing the relevant area of science and knowing the ordinary technical use of seemingly non-technical language. This is a lot to demand of any reader. Perhaps then we should worry less if our work is sometimes misunderstood whilst doing all we can to make it clear.

Rejecting the use of teleological language outright may not be practical as it is useful to biologists in asking their particular questions. Only giving this pragmatic reason to keep it is, however, not enough. A pragmatic response alone does not establish or recognise any conventions for use and thus seems to allow in too many possible uses of the language thus potentially increasing rather than resolving the problems caused by this. Accepting that there are perfectly ordinary, if not everyday, uses here does give us a viable alternative to rejecting the use of teleological language.

I say it gives us a viable alternative as I do not want to be taken as concluding that we should in fact keep teleological language. Indeed, it may on balance be better to avoid this where possible if it is likely to prove particularly problematic. To say that there is an ordinary use of a term is not to commend that use, it is purely descriptive.[[47]](#footnote-47)

What I do want to say is that teleological language does not *necessarily* reflect teleological thinking in the present and that we can have the former without having the latter.

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1. Dr Sarah Hitchen, Lancaster University. [↑](#footnote-ref-1)
2. Ryle, ‘Systematically Misleading Expressions’, *Collected Essays 1929-1968*, (Routledge, 2009),pp 41-65, pg. 59 [↑](#footnote-ref-2)
3. See for an example of heated debate of this kind the exchange between Richard Dawkins and Mary Midgley which took place in the early 80s at Dawkins R., ‘In Defence of Selfish Genes’, *Philosophy*, Vol. 56, No 218 (October 1981), pp 556-573, Dawkins R., Endnotes to chapter 4, *The Selfish Gene* (Oxford University Press, 1989 edition) pg. 278, Midgley M., ‘Gene-Juggling’, *Philosophy*, Vol.. 54, No 210 (Oct 1979), pp. 439-458 [↑](#footnote-ref-3)
4. Ryle makes a similar point in ‘Ordinary Language’ stating that ‘…the appeal from philosophical jargon to the expressions which we have all had to learn to use properly… is often one well-worth making; where a corresponding appeal to the vocabulary of Everyman from the official parlance of a science, of a game or of law would often, not always, be ridiculous.’, *Collected Essays 1929-1968*, (Routledge, 2009), pp314-331, pg. 329 [↑](#footnote-ref-4)
5. I use entirely here as, as we shall see, there is an ordinary use of such words in Biology, it just happens not to be an everyday-ordinary use [↑](#footnote-ref-5)
6. A point which Ryle makes in ‘Ordinary Language’, *The Philosophical Review*, Vol 62, No 2 (1953), pp 197-186 at pg. 170 [↑](#footnote-ref-6)
7. To show this we can borrow some simple examples from Searle (‘Metaphor’ in Ortony ed., *Metaphor and Thought,* (Cambridge University Press, 1979), pg. 92). If we say ‘Sally is a block of ice’ or ‘Sam is a pig’ we are very unlikely to miss these as non-literal statements even if we don’t know to apply the term ‘metaphor’. If instead someone says, and again Searle takes the credit here, ‘Sally is a prime number between 17 and 23’ then, though we may struggle to see exactly what they are getting at we are as unlikely in this case as in the ‘…block of ice’ case to take them as speaking literally. When we come to the case of metaphor in science non-literal statements may not jump out to the casual reader as such, especially if they are primed to read as-literal. ‘Worm hole’ may jump out at us as *obviously* non-literal once we have been asked to pause and think about this (though it may more normally be simply skipped over as simply a name, and if this case sees too obvious, what about Black Hole). ‘Electron cloud’ may not be so obvious. ‘Gene for’ is perhaps even less so. Worm hole and electron cloud from Boyd, ‘Metaphor and Theory Change’, in ibid, pg. 359 [↑](#footnote-ref-7)
8. as, for example, George C. Williams does in *Adaptation and Natural Selection.. A Critique of Some Current Evolutionary Thought*, (Princeton University Press, 1966) [↑](#footnote-ref-8)
9. In order to hold this view we don’t have to be committed to a Feyeraband-type understanding of science. Rather we can accept that science is not just a catalogue of facts but is a critical and investigative practice. See for example, Cartwright N., *The Dappled World. A Study of the Boundaries of Science*, (Cambridge University Press, 1999), Dupré J., *The Disorder of Things. Metaphysical Foundations of the Disunity of Science*, (Harvard University Press, 1993) and Haack S., Six Signs of Scientism, (October 17th, 2009) available at http://pervegalit.files.wordpress.com/2011/03/haack-six-signs-of-scientism-october-17-2009.pdf [↑](#footnote-ref-9)
10. Young J.Z., *Doubt and Certainty in Science. The B.B.C. Reith Lectures 1950*, (Clarendon Press, 1951), pg. 11 [↑](#footnote-ref-10)
11. From within biology [↑](#footnote-ref-11)
12. Or as Grene and Depew have adopting the term ‘teleonomy’ he ‘side steps’ the problem following in Pittendrigh’s footsteps, Greene M., Depew D., ‘Some Themes in Recent Philosophy of Biology’, *The Philosophy of Biology. An Episodic History,* (Cambridge University Press, 2004), pgs. 313-322 , pg. 315 [↑](#footnote-ref-12)
13. Mayr , ‘Teleology,’ *What makes Biology Unique? Considerations on the Autonomy of a Scientific Discipline*, (Cambridge University Press, 2004), pp 39-66, pg. 52 [↑](#footnote-ref-13)
14. Mayr, ‘The Multiple Meanings of Teleological’, *Toward a New Philosophy of Biology. Observations of an Evolutionist*, (Harvard University Press, 1988), pp 38-66, pg. 39 [↑](#footnote-ref-14)
15. Law does of course have its’ share of technical terms, however many of these did not begin their lives as such, see, for example Pollock and Maitland ‘Few, if any, of the terms of our legal vocabulary have always been technical terms. The licence that the man of science can allow himself of coining new words is one which by the nature of the case is denied to lawyers. They have to take their terms out of popular speech; gradually the words so taken are defined; sometimes a word continues to have both a technical meaning for lawyers and a different and vaguer meaning for laymen; sometimes the word that lawyers have adopted is abandoned by the laiety.’ Pollock F., Maitland F.W., *The History of English Law Before the Time of Edward I*,(Liberty Fund, 2010), pg. 32 [↑](#footnote-ref-15)
16. See for example Greene M., Depew D., ‘Some Themes in Recent Philosophy of Biology’, *The Philosophy of Biology. An Episodic History,* (Cambridge University Press, 2004), pgs. 313-322, pg. 315 [↑](#footnote-ref-16)
17. That same source being Pittendrigh (Pittendrigh, C.S., ‘Adaptation, Natural Selection and Behaviour’ in Roe A., Simpson G.G. eds., *Behaviour and Evolution*, (Yale University Press, 1958), pp. 390-416). See Williams Williams George C., *Adaptation and Natural Selection. A Critique of some Current Evolutionary Thought*, (Princeton University Press, 1966), pg. 258and Mayr E., ‘The Multiple Meanings of Teleological’, *Toward a New Philosophy of Biology. Observations of an Evolutionist*, (Harvard University Press, 1988) pp38-66, pg. 47. Mayr uses teleonomic to describe his system based upon information and programmes whilst Williams retains an Aristotelian approach with natural selection taking the place of the Aristotelian final cause [↑](#footnote-ref-17)
18. ‘The World of Science and the Everyday World’ and ‘Technical and Untechnical Concepts’ in Ryle, *Dilemmas*, (Cambridge University Press, 2002) [↑](#footnote-ref-18)
19. ibid, pg. 85 [↑](#footnote-ref-19)
20. Ryle G, Ordinary Language, *Collected Essays 1929-1968*, (Routledge, 2009), pp.314-331, pgs. 314-8 [↑](#footnote-ref-20)
21. ibid, pg. 315-6 [↑](#footnote-ref-21)
22. And remember this is a deliberately simplified illustration, the suggestion here is not that the language case is as straightforward as this [↑](#footnote-ref-22)
23. Ryle G, ‘Ordinary Language’, *Collected Essays 1929-1968*, (Routledge, 2009), pp.314-331

    85-92 [↑](#footnote-ref-23)
24. ibid pg 85-6 [↑](#footnote-ref-24)
25. As Ryle puts it ‘The question whether this Queen of Hearts is, at a particular moment, a trump-card or not depends on the prior question whether four people are playing Bridge with the pack containing this card; and what makes Hearts, or some other suit, trumps is nothing occult or latent behind the glossy faces of the cards, but simply the general nature of the game of Bridge and the particular turn the bidding has taken during a particular stretch of the game.’ ‘Technical and Untechnical Concepts’, *Dilemmas*, (Cambridge University Press, 2002) pp 82-92, pg. 86 [↑](#footnote-ref-25)
26. ibid pg. 87 [↑](#footnote-ref-26)
27. In particular in philosophy of mind [↑](#footnote-ref-27)
28. It would seem very odd to imagine that we could not stand up from the Poker table and move to the Bridge table without having to carry with us the poker-attributes of the cards we use. For a start this would make it impossible for us ever to play more than one card game as, once we have played Poker, we can never play Bridge. Our cards would simply possess the wrong ‘attributes’ to allow us to do so. In contrast, it may seem natural to expect that we can carry the terms we are familiar with across disciplines and have them retain their familiar [↑](#footnote-ref-28)
29. Ryle, *Dilemmas*, (Cambridge University Press, 2002) and Dupré John, ‘Natural Kinds and Biological Taxa’, *Humans and Other Animals*, (Oxford University Press, 2002) pp. 19-41, pg 31 [↑](#footnote-ref-29)
30. Austin J.L., *Philosophical Papers*, (Oxford University Press, 3rd ed, 2007) Ordinary language includes technical and non-technical uses the distinction here is not between ‘everyday’ and technical, there are both ordinary and non-ordinary technical uses, see Ryle G, ‘Ordinary Language’, *Collected Essays 1929-1968*, (Routledge, 2009), pp.314-331 [↑](#footnote-ref-30)
31. Dupré, ‘Natural Kinds and Biological Taxa’, *Humans and Other Animals* (Oxford University Press, 2002), pp 42-55, pg. 31 [↑](#footnote-ref-31)
32. though these latter are vulnerable to mistaken revision under the assumption of science-as-greater-truth. See ibid [↑](#footnote-ref-32)
33. Dupré names here ‘...the timber merchant, the furrier... the herbalist’ as examples Dupré, ‘Natural Kinds and Biological Taxa’, *Humans and Other Animals*, (Oxford University Press, 2002), pp 19-41, pg. 32 [↑](#footnote-ref-33)
34. Thinking in terms of use rather than meaning here is particularly helpful as, as Ryle states, ‘There is another merit in this idiom [use]. Where we can speak of managing handling and employing we can speak of mismanaging, mishandling and misemploying. There are rules to keep or break, codes to observe or flout. Learning to use expressions, like learning to use coins, stamps, cheques and hockey-sticks, involves learning to do certain things with them and not others; when to do certain things with them, and when not to do them.’, Ryle G, ‘Ordinary Language’, *Collected Essays 1929-1968*, (Routledge, 2009), pp.314-331, pg. 320 [↑](#footnote-ref-34)
35. Ryle G., ‘Technical and Untechnical Concepts’, *Dilemmas*, (Cambridge University Press, 2002) pp 82-92, pg. 87 [↑](#footnote-ref-35)
36. Sometimes uses are defined, for example in the case of ‘planet’, but this is not always possible or desirable [↑](#footnote-ref-36)
37. Ryle,ibid, pg. 90 [↑](#footnote-ref-37)
38. This latter condition will often exclude the interested non-biologist who does not have the time available to grasp the field and revise their various readings in light of their expanding knowledge. This is one reason why we cannot perhaps fully dissolve problem one, however, it seems this may be a problem which is particularly obvious in the case of teleological language but which is particular to the communication of any subject between experts and non-experts [↑](#footnote-ref-38)
39. Interview with Richard Dawkins, originally published in *The Philosophers Magazine*, republished as ’Genes and Determinism’ in Baggini J., Stangroom J., eds. *What Philosophers Think*, (Continuum, 2003) pg. 42-52 [↑](#footnote-ref-39)
40. Interview with E. O Wilson, originally published in The Philosopher’s Magazine, republished as ‘Science as the New Philosophy’ in *What Philosophers Think*, pg. 66 [↑](#footnote-ref-40)
41. I am not, of course, claiming that we will discover this to be the case. [↑](#footnote-ref-41)
42. The rules of the games we play may change over time just as the meanings which attach to particular uses may [↑](#footnote-ref-42)
43. Ryle G., ‘Technical and Untechnical Concepts’, *Dilemmas*, (Cambridge University Press, 2002) pp 82-92, pg. 90 [↑](#footnote-ref-43)
44. See for example Dupré J., Understanding Contemporary Genomics, *Perspectives on Science*, vo12, no3 (2004) pp. 320- 338 [↑](#footnote-ref-44)
45. Those which are useful remain? [↑](#footnote-ref-45)
46. Dupré J., Understanding Contemporary Genomics, *Perspectives on Science*, vo12, no3 (2004) pp. 320- 338, pg. 325 [↑](#footnote-ref-46)
47. See Ryle G, ‘Ordinary Language’, *Collected Essays 1929-1968*, (Routledge, 2009), pp.314-331, pg. 316 [↑](#footnote-ref-47)