

At the Feast of Lambda the Ultimate – a letter to Jonathan Swift 1

Here is a curious letter that I came across the other day. There are a few points that not everyone will understand, so I've added a footnote or two. It seems to be addressed to Jonathan Swift. I've never heard of the author, who signs himself Apocryphus Scrope (Phd).

Dear Dean Swift,

I thought you might like to hear how things continue a bit after your time. I had the good fortune the other day to be present at a great ceremony in the high temple of Computational Linguistics to see them celebrate the feast of Lambda the Ultimate.

Clouds of incense filled the air, but as I had secured a good position, I was able to see very clearly the elaborate insignia which adorn the high altar – the ineffable *f*, *x*, *epsilon* and all the rest of them. The triptych itself is a masterpiece in which diaphanous flights of Monads sing hymns to great Lambda, while the symbols *S*, *K* and *I* hover always close in attendance.

Then as expectant quiet settled on the great congregation, a distant murmur, the ancient chant of professors processing - '*alienum eheu amice mihi ...*'¹ - as the first of them filtered into the aisle, each wearing his or her own elaborate variation of the traditional costume.

In your day I think things were much simpler, so you may never have seen even the basic professorial robes, let alone the elaborate headgear, which has developed so far in recent times. The deep symbolism of it all is quite moving.

As you know, it is an absolute dogma for science that minds should be open to new ideas, while at the same time the fiercely competitive yet sensitive character of the modern professor finds this quite hard, as it leaves him or her exposed to a great potential for embarrassment and hesitation. So the headgear has evolved to resolve this conflict and to appease the great Lambda, while preserving the professor from risk of embarrassment. The first essential is to incorporate some kind of enclosure – 'the closure' – which can be clearly shown to be open – 'unbound' is the technical term. The second is to combine the protective comfort of focus with a due deference to the ideals of curiosity and openness.

Out of these formal requirements a basic model of headgear emerged: it quickly appeared that mere blinkers were inadequate, somehow old-fashioned and 'not philosophical' – despite your great writings my dear Dean, horses are even now not frequently seen in our places of learning - so they evolved into extended binocular tubes, which have proved very effective and can be elaborated to give a powerfully scientific and modern appearance. These tubes can easily be attached to a structure, essentially a simple box, although this can clearly be seen only in the costumes of the most radical professors of the newest kind for whom direct expression is all. This forms the 'closure', and it always has a lid that nowadays is constructed so that it is fixed in the open position, with merely ritual and vestigial but obligatory elements to imply that

1 "not my field, I'm afraid, old chap ..."

it could easily be closed, and that it is only by the great virtue of the wearer that it is in fact open.

These elements provide the fixed basis for individual creativity – but of course there are common themes. So typically the whole thing is encrusted with decorations, emblems and other devices. Some are painted all over with eyes to suggest omnidirectional vision, while others combine a few eyes with numerous mirrors – this arrangement gives its wearer an exotic appearance which increases with the brilliance of the surrounding regalia.

There are of course also a few maverick professors who look about with naked and shameless eyes, but we try not to gratify their vanity by noticing them.

So perhaps you can now imagine the scene as the professors arrive and take their seats in the choir – the strange gait of recursive descent favoured by some contrasting sharply with the plainer but still sometimes surprising 'left-right-brackets-kay' or 'bottom-up' style that others prefer.

Immediately behind the massed ranks of professors, there enters the Professor for the Public Understanding of Stuff himself. A deep hush settles as he launches into a seductive and sinuous chant – the moving verses that are by immemorial tradition reserved to him and all his successors: '*Quid? Nimis hoc Domine nescio ...*'² - the '*gaudelpus*'. He takes his place as his colleagues respectfully greet him – quick exchanges of 'memetic' and 'ah yes, shift-reset monadic '.

But immediately behind him came the Symbols – Terminal Symbol and Nonterminal Symbol, each with his own 'Cadmus' bag³, and then Preferred Symbol himself, holding his eponymous Symbol before him on a fine tasselled cushion.

And so at last the Black Boxes are brought in on a kind of palanquin with six bearers. The Black Box you will recognise - your friend Mr. Lemuel Gulliver saw something very like in his visit to Lagado⁴ - it is a kind of oracular engine. Inside it there is a collection of Rewriting Rules, and these, with the two different kinds of Symbols and the Preferred Symbol are said to 'generate' the Utterances of Language. There are four Black Boxes in all, which I will quickly describe – they are said to contain the whole secret of Language.

The first contains Unrestricted Rewriting Rules - it is decorated with emblems that represent the Original Turing Machine, and it is said to generate a sacred language that nobody can possibly ever understand – it has no handle, and they say that it has never been opened.

The second is decorated with sensitive plants in honour of the so-called Context-Sensitive Rules. They say that the few who have ever looked into this box were almost immediately struck dumb – so of course not much can be said about the language that belongs to it.

The third is decorated with every kind of tree – it contains the Context-Free

2 "What? Oh Lord I don't know too much about that ..."

3 Perhaps a memory of the bag in which Cadmus brought writing from Tyre to Boeotian Thebes

4 See Part III Chapter V in *Gulliver's Travels* by Jonathan Swift – the original generative engine?

Rules (blessings be upon them) and produces the kind of language that is suitable for ordinary people. Unfortunately it does not allow you know anything about the meaning of any of these languages, so the trees that are its emblem are always represented as having no fruit.

The fourth Black Box is decorated with a strange motif – a cluster of globular objects (in some ways reminiscent of the famous statue of Diana at Ephesus). Some say that this is a cluster of pearls, but to me it looks more like a raspberry.

Finally the Parse Tree itself is brought in at the tail of the procession, just behind the palanquin. As the sermon explained, the Parse Tree is intended as a reminder to all of us of the power and importance of hierarchical structure.

I find that it is very good for my soul to believe almost everything that I am told about these things – the Symbols, the Rewriting Rules, and the comforting simplicity of the Parse Tree. Of course I pride myself (as all of us do) on the independence and originality of my mind, but I find adequate scope for that in imagining the different ways in which a Parse Tree can be produced by applying the Context-Free Rules (blessings be upon them) to the Symbols. If I am tempted to go much beyond that I restrain myself by quietly singing the verses I learnt as a child:

*Double your grammar, double your bluff
With Van Wijngaarden W-stuff!*

But I did hear the other day about a heretical question that some renegade outsider had asked. It seems that he wanted to know in far too much detail exactly how the Rewriting Rules actually worked.

In fact it is much worse than that. He says that he has found out how they work in an 'online' algorithm that goes at it Symbol by Symbol. He says that he has made a system of that kind, and that you can apply it directly to the Utterances, and it helps you to understand their structure and even their meaning. He says that if you do this, you don't need to think about generating the Utterances from the Symbols. In effect he accepts only the Symbols and his own heretical version of the Rewriting Rules. He says he has a whole series of pictures that show how they work – but I am not sure if it would be proper to look at them, as he even says that his system contains the great Lambda.

On top of all that he says that we can make do with merely 'the ghost of a Parse Tree' – a phrase that gives me great pain. Not only does he say that his kind of Rewriting Rules can be constructed to recognise any of the Utterances, but also that they could even be used to generate the Utterances – although he doesn't seem to think that anyone would actually want to do that.

But I think they gave him pretty short shrift, and I do find that a great comfort. I know that we have not always in all things seen eye-to-eye, but I flatter myself that on this point we would surely agree.

I remain yours etc

Apocryphus Scrope (PhD)