

## *General prologue: time travel and signal processing*

---

It's a well-known but normally ignored paradox that the senses do not confront the phenomena they apparently receive at the time these inputs 'actually' occur. For most practical purposes of course, given the speeds of light and sound, the gap between occurrence and perception is so short as to be invisible. But consider for instance the case of lightning and thunder, where the disparity is patent. As it may be, even more strikingly, if one were shot at a sufficient distance. In that case the victim would first perceive the muzzle-flash, then the impact of a supersonic bullet, and finally (*ceteris paribus*) hear the shot. Not that most people in such circumstances would be likely to reflect on these matters, but there it is. The scholar can afford an apparently callous displacement.

In other cases however the disparity is so enormous that we habitually suppress it by certain kinds of counterfactual conventions, in order to be able to talk sensibly or retain our sanity. We speak of 'visible' celestial objects thousands of light-years away as if we thought we were seeing them as they are; yet if we are contemplating something 10,000 light-years away, this is a measure not just of distance but of real time; any photon reaching us from this object has taken 10,000 years to get here, so we are in fact seeing something that 'happened' 10,000 years ago, literally looking into the past. In principle the object could have ceased to exist 9,000 years ago, and we would still be seeing it for a millennium; just like the muzzle-flash, which no longer 'exists' as such by the time we perceive it as a signal (in fact it has gone already by the time it reaches the retina; there is yet more time consumed in afferent and efferent processing). So the fact that sensory inputs take real time to arrive from their sources (not to mention the further time consumed in on-line processing of these signals) means that our 'present' is in some respects (not all of them important, but some very interesting) a web of undigested and unreflected-on illusion.

In historical linguistics at least a certain class of the signals we take as indexes of the past appear to come to us without a first-order time lag. That

## 2 *General prologue*

is, documentary material. A text may be 1,000 years old, and we know that perfectly well, but we look at it in the present as a survivor, and recognize that even though it 'is', the proper verb really is 'was'. We are simply being granted in an obvious way (unlike the case of the celestial object, which requires reflection) the privilege of looking as it were paradoxically back into time. But this is only a rather small part of what we actually do as historical linguists, and it is not surprising that this should be so.

Even in the physical (or better technological) world of the present, however, there are classes of 'percepts' that are normally mediated via what is now commonly known as 'signal processing': what we see is not actually what we (or our instruments) got, but the result of what's happened afterwards. But we often accept such objects as 'real' (or at least don't bother to reflect on the precise ways in which they are unreal): e.g. satellite images showing temperature gradients or greenhouse gas emissions or whatever in different colours. In such cases the clarity with which we see them and even the distinctions that we (think we) see are conventional(ized) illusions. It's not really the case that hot regions are red and cool ones blue or green when seen from a satellite in orbit; the digitized images are manipulated so as to re-interpret (invisible) temperature in another sensory modality.

In other instances, signals may be selectively manipulated, in order to create some kind of image out of a mass of relatively hard to perceive data. In particular, since the signals we get from the linguistic (or any) past are highly degraded, we may require extensive processing operations, in some cases even to allow us to make judgements about what sorts of objects they represent (see §§2.5.2–2.7).

In a way the bulk of this book is actually about signal processing (for an accessible discussion in the context of geology see Cutler 1995). Such procedures can be used both for 'filtering noise, smoothing images' (Cutler 1995: 38) and for the opposite, sharpening images or adding occult detail. As I will indicate later (especially in chapters 1–3, 5–6), the craft of the historical linguist is largely concerned with signal processing of various kinds: in particular with what are known as 'convolution' and 'deconvolution'.

In convolution, the problem is to extract a useful picture showing trends, overall shapes, etc. from an overcomplex image (a familiar example would be a low-pass filter, which screens out fine grain in a photograph or hiss on a tape, and produces a clearer image or recording than would have been available with the original noise left in). To take a more detailed example, we might use an algorithm that processes an image on a computer screen pixel by pixel, applying some instruction like 'average the grey-scale value

of any pixel with that of its  $n$  closest neighbours'. The result would be lacking in original detail, but by taking some kind of weighted 'norm' would create a more easily interpretable picture.

Using the same input, say we found that the picture was too foggy, and wanted to display not general trends or shapes, but fine detail. In this case we could 'deconvolve', e.g. by amplifying the tonal differences between adjacent pixels. Such formal manipulation is familiar in video and audio technology; it is only rather recently that it has been used as a historical tool, particularly in palaeontology (see Cutler's discussion of recent work which applies both techniques to deep-ocean sediments).

Actually of course unformalized versions of such procedures have for a long time been the stock in trade of historical linguists (or any other historians). The standard process of extrapolating trends or 'shapes' of historical trajectories or 'drifts' (see §6.3) is in fact informal convolution; conversely, the invention of detailed etymologies on the basis of often scanty and difficult evidence is deconvolution. One kind of processing suppresses detail in the interests of the Big Picture, the other decomposes the Big Picture in the interests of discovering the details that made it in the first place (see §6.2).

So as time-travellers we manipulate our landscape, and we do it in different ways depending on the kind of pictures we happen to be interested in seeing. This book in a sense is about just these two things: the adventure of linguistic time-travel, and the manipulations we perform on the scenery to make it 'scenery' rather than just confused images whizzing by.

# 1 *The past, the present and the historian*

---

Remembrance and Reflection how ally'd;  
 What thin partitions Sense from Thought divide  
 (Alexander Pope, *An essay on man*, I.225–6)

## 1.1 The historian as mythmaker

I use the word *myth* here in a non-pejorative, or at least neutral, way. For the late Romans and most of the postclassical world, Greek *múthos* and its derivatives have had senses like ‘fabulous’, ‘naive’, ‘erroneous’ (late L *mýthos* = *fabula*). There is an older interpretation too: myth is *vera narratio*, universal truth in allegorical disguise. I have in mind something less tendentious, more modern: a myth in the widest sense is a story or image that structures some epistemic field (knowledge, thought, belief) in a particular culture.

Myths come in many forms. Some are large-scale origin-stories, like (neo-)Darwinism or ‘scientific creationism’. Others are shorter, more local: acne may be caused by youthful onanism, or infection of the sebaceous glands; thunder by electrical discharge or the borborygmus of Zeus. There are non-narrative or static myths as well, powerful images of things now existing or that once existed: the abyss over which the Spirit of God broods dovelike in Genesis 1, or the singularity preceding the Big Bang.

These paired examples make a fundamental point: given an agreed framework, mythical ‘truth’ is decidable. But the function of the myth, as a structuring device giving some piece of empirical or conceptual chaos an architecture, filling a void, is in principle independent of its truth value. Its utility derives from its perceived truth or explanatory or gap-filling efficacy. Any device that mitigates the *horror vacui* is, under certain conditions, as good as any other. ‘Goodness’ is framework-relative, defined by local standards specifying acceptable myth-types or myth-components. These can be explicit, or (as is more usual) implicit.

1.1 *The historian as mythmaker* 5

This is not advocating a flabby postmodern relativism. The key issue is the nature of these standards: a (non-religious) mythology<sup>1</sup> has to meet criteria of empirical responsibility and rationality not binding on mythologies serving different purposes.<sup>2</sup> Standards – their nature and the problems that can arise from their relativity – are one of the underlying themes of this book. What standards are or ought to be adopted in historiographical activities like reconstructing or explaining? How does our current historical linguistic mythology stand up when measured against them? And indeed, where does our mythology come from, what (implicit or explicit) arguments and insights and dogmas underpin it?

The histories of languages (as objects available to or made by linguists) are, like all histories, myths. We do have documents for portions of many of our histories; but even these are subject, like scripture, to exegesis: we don't *know* what they mean (the less, the older they are). We do however tell (and believe) stories about them, not just the documents but the languages they supposedly reflect; the reality (phonic, grammatical, semantic, etc.) the symbols in these documents represent, what might have been happening in the holes between documents, or in periods when texts seem not to change, why particular changes (and not others, or none at all) occurred . . . and so on. We in the trade obviously think the mythology overall is pretty good, or we wouldn't (unless most of us are more cynical than seems likely) keep on teaching it and writing about it.

But a venerable rational mythology, apparently grounded in argument and extrapolation from putative evidence, can pose a major problem: the longer it exists, the less succeeding generations or practitioners tend to know or remember (if they ever knew) or even care about how it came into being, or what supports its main tenets. Indeed, judging from my own previous experience, I'd hazard the claim that many of us do not know exactly

<sup>1</sup> That is, a 'single-stranded' or epistemically dedicated mythology, arising from division of labour: (proto-)scientific pursuits are severed from collective cultural concerns (religion, solidarity, etc.). For discussion of the evolution of this kind of split ('social' vs. 'scientific') worldview see Gellner (1991).

<sup>2</sup> On some definitions, (quasi-)scientific discourses might seem not to qualify as mythic. For Peter du Preez (1991: 81ff.), myths are 'an attempt to search sacred texts for the real names of events in the world'. But it could be argued that once concepts (from whatever source) are 'ideologized', and unobservables given an axiomatic or dogmatic status, even a discipline with a rational infrastructure becomes mythic. In classical mythical thinking (du Preez, 82), discovery of the 'real names' of things allows us to recognize them in the world, and achieve, in contemplating the supposed realizations of these underlying entities, a 'zero-displacement' from reality, i.e. the illusion of direct contemplation of *realia*. Du Preez gives examples of 'sacred names' in the social sciences, like 'class', 'proletariat', 'democracy'; in our own discipline we might instance 'morpheme', 'underlying form', 'phoneme', etc.

## 6 *Past, present and the historian*

which parts of the whole belief structure (historical linguistic praxis<sup>3</sup> in general, or the received wisdom about the histories of particular languages or families) are really founded on good argument, or what the arguments are, or even if there are any. At least this tends to be so outside one's own specialist terrain. After twenty-odd years of work on the Great Vowel Shift and related matters I have (so I say) a pretty good idea of the rights and the wrongs of it all, what 'really happened', why *X* said *p*, and so on. But until recently, for instance, I had no evidence for the belief that the graph ⟨h⟩ in Old English represented [h] initially (as in *hand*), and either [x] (*dāh* 'dough') or [ç] (*niht* 'night') after vowels (see §2.2.4 below). Yet for more than two decades I've taught this to my students, and shown them where to find handbook references that tell them it's true. In many important cases we may be passing on, as precious and firmly held beliefs, replicas of assertions that someone somewhere once made, transformed into Articles of Faith.

As historical linguists, both within our own discipline and as purveyors of its content to others, we generally accept certain propositions about the earlier stages of some language, or its ancestors, as true, or as close as makes no difference. And we believe that certain standard techniques (comparative and internal reconstruction, for instance) deliver sound and trustworthy knowledge, and use them unreflectingly in our ritual transactions. But even those admitted to the Arcana ('trained', as we say) may not always know in detail just why they believe such things, whether rationally, or through having been gently brainwashed by the tradition they grew up in. It turns out, I think, that in many ways the edifice under discussion is a good one, if in need of repairs; but much of our knowledge of the geography of the house is rather poor. Most practitioners have neither the inclination nor the temperament to rediscover it. The basic assumptions and procedures are traditions, and we tend, unless pushed, to take them on faith.<sup>4</sup>

To substantiate this, I propose a little test for any professional historical linguist reader, or general linguist with some historical interests. Imagine yourself asked by a reasonably tough-minded student or linguist from some

<sup>3</sup> Myths are of course usually associated with rituals: the praxis (reconstruction, traditional modes of data-processing, interpretation, etc.) is ritual enabled by and reflecting the foundational myths.

<sup>4</sup> This is a bit of a caricature: Hoenigswald (1960), Haas (1969), Anttila (1989), Hock (1991) and others have indeed explored the foundations, often brilliantly. But it is still true for many practitioners, I suspect, other than those with a particular interest in 'rational reconstruction' or in the history of the discipline.

### 1.1 The historian as mythmaker 7

other field (or even worse, an intelligent non-linguist academic) what the evidence is for the following propositions:

- 1 Comparative method can yield reliable ancestral forms for given attested ones, so that we can for instance rationally believe that the Indo-European root meaning 'turn' was at least \*/wVr-/ , or 'foot' was \*/pVd-/.
- 2 Internal reconstruction can yield historical information as well, but of a somewhat different sort; certain configurations of merger are in principle inaccessible to it, and require comparative backup.
- 3 The graphs ⟨p⟩ in Latin, ⟨π⟩ in Greek represented labial stops, and Gr ⟨φ, θ, χ⟩ represented aspirated stops, respectively labial, dental and velar.
- 4 The vowels of *meat* and *meet* were once distinct; and this distinction is parallel to the one between those of *boat* and *boot*.
- 5 Verner's Law must have been later than Grimm's Law, and its outputs were voiced fricatives.
- 6 One crucial 'proof' that Hittite is Indo-European is the morphology of its word for 'water'.
- 7 Indo-European had at least one 'laryngeal' consonant, and maybe as many as three.
- 8 There is just possibly a genetic relation between Uralic and Indo-European, but not the same kind as between Germanic and Italic, and it can't be argued for in the same way.
- 9 A full vowel-harmony system of the kind found in Modern Hungarian and Finnish is not reconstructable for Proto-Uralic.
- 10 Finnish *sata* '100', *vesi* 'water' are old Indo-European loans which must be from Baltic rather than any other group; but *ranta* 'bank', *ruhtinas* 'prince' are Germanic.

These are just odd examples, 1 and 2 for generalists, the others for various kinds of specialists, but all one basic type. They raise the same question: how easily (if at all) could you construct an argument, marshalling the various kinds of evidence for (or against, for that matter) each of these generally well-accepted beliefs? My guess is that unless you happened to have worked specifically on or taught one of these issues at a fairly advanced level, preferably fairly recently, it would be hard to be both coherent and convincing. Anybody can forget data, of course; but we rarely engage in what Hockett (1987) calls 'refurbishing our foundations'. We tend not to feel the need for it; typically we all started out in our student

## 8 *Past, present and the historian*

days with highly theory-based propositions as givens, and learned how to find 'support' in the handbooks. I certainly only discovered the main (often enormously complex and partly indirect) justifying arguments for comparative reconstruction long after I'd learned the fine details of Grimm's and Verner's Laws, and after I'd begun teaching them.

The first part of this book (chapters 1–5) is a kind of metamythology, looking at some of our central myths and rituals. In particular, 'golden age' reconstructions: the notion 'protolanguage' and what we mean by it, the evidence for filiation, the relation between assertions about very distant ancestors and the properties of their descendants. And behind all this, general problems of method and argument, and the claims of our primary techniques for reconstruction and the interpretation of older linguistic data to yield reliable knowledge. The idea is to see what really underwrites some of our beliefs, and how well they stand up under scrutiny. In some cases I will even introduce some counter-myths that I think we ought to be living by, and indicate where there seem to be genuine indeterminacies or issues that (whatever people may have thought) are in principle undecidable.

The aim is not to demythologize, though I will attempt to demystify, i.e. somewhat tediously dissect masses of evidence and argument not usually brought out into daylight. In many cases I don't know, or can't recover, the actual (intellectual–historical) foundation arguments; but I'm less interested in rediscovering what arguments the pioneers built their beliefs on, than in unpacking the kind of evidential structures that must underwrite rational belief in certain propositions. In a pseudo-naive way I will ask from time to time if the emperor is naked, and suggest how one might tell.

So despite an interest in the (historical) motivations for traditional beliefs, this is not primarily or even largely a work of intellectual history. My concern is with what we ought to believe now, and why. Not all the evidence that supported (or for some continues to support) traditional beliefs is well founded, or even generally believed any more. If  $X$  in 1890 believed (the true) proposition  $p$  on grounds  $G$  that are now untenable, then my belief in  $p$  is best served by raking up the good arguments and discarding  $G$ . An argument is (often) known by the company it keeps, and guilt by association is not unheard of even in ivory towers.

The naked factual claims of historical disciplines are always shakier than they seem; historiography is both conventionalist and constructivist. Even the notion 'truth' in history is different from what it is in other kinds of subjects. This chapter will deal with some historiographical fundamentals, and



*1.2 Messages from the past* 9

the constraints that ideally operate to curb historians' more baroque fantasies; it will try to set linguistic historiography in a context where it can be compared to (and maybe learn from) some of its congeners, especially evolutionary biology. But I begin with the most basic and difficult problem of all: why there should be any such thing as linguistic history (as opposed to linguistic structure), and whether either of these notions is coherent. My answer may be surprising to some.

### 1.2 Messages from the past: historical understanding and the problem of 'synchrony'

Anyone obsessed with one pole of a dipolar subject tends (subtly or not) to devalue the other. In the usual intolerant discourse of our trade anything that doesn't reflect your own obsession is 'uninteresting'. I suggest, somewhat perversely perhaps, but for the sake of the clarity that extreme positions can induce, that synchronic structure in the conventional sense may be less 'interesting' than the central dogma<sup>5</sup> of contemporary linguistic theory suggests it might be. This section is a critical reflection on whether the ambiguous benefits of one of our field-defining dichotomies are really worth retaining. I think that the current mainstream view of what 'synchrony' might really be is insufficiently subtle and wide ranging. Perhaps, to quote an apparently off-the-cuff but telling remark of Elizabeth Traugott's, synchronic linguistic structure, far from being the central concern of linguistic theory, ought rather to be treated as 'a kind of way-station along the path of history'.<sup>6</sup>

For the better part of a century, linguists have traditionally made a sharp distinction between two branches of their subject: synchronic (the study of particular language states as they exist at particular times), and diachronic

<sup>5</sup> This phrase (apparently due to Francis Crick) refers to the claim in molecular biology that the nucleotide/protein relation is unidirectional: DNA makes RNA and RNA codes for protein (now falsified by retroviruses like HIV that use their own RNA as templates for producing new DNA in host cells: cf. Eigen 1992: part II, chs. 7–8). It has also been co-opted for evolutionary genetics, as the fundamental assertion that genes influence phenotypes, but never the reverse (acquired characters are not inherited, etc.: Dawkins 1989a, b). I refer here not to content (language history in a sense is nothing but the 'inheritance of acquired characters'), but to the ideological role of a particular dogma, which I outline below.

<sup>6</sup> Comment made in the course of a lecture at the Deutsche Gesellschaft für Sprachwissenschaft summer school, Göttingen 1992. A similar view animates much of Anttila (1989): 'Existence is change' (398), 'theoretical linguistics is genetic linguistics' (411); but my point of departure is very different (see chapter 7 below for details).

## 10 *Past, present and the historian*

(the study of linguistic change or linguistic history).<sup>7</sup> In a sense this distinction is well taken; intelligent study of the linguistic past relies on an understanding of the linguistic present, under the assumption that all the past language states we study are in principle the same kind of animal as present-day ones (see §1.5). But methodologically the study of given language states ‘in snapshot’ as it were is clearly distinct in principle (or so it would seem) from the study of changes over time.

Like all hard dichotomies this obscures as much as it clarifies. The underlying claim appears to be that ‘the structure of a language’ is nothing more than an aspect of speakers’ knowledge. (Or more cautiously, of linguists’ abstractions over actual and potential speaker behaviour, and attribution of the source of this behaviour to speakers’ knowledge of a linguistic system.) Structure therefore must be independent of history. This view arises from the position, sketched somewhat unclearly in Saussure, but now strongly encouraged by ‘the Chomskyan turn’ (Kasher 1991), that a language is (nothing but, only) ‘a system of knowledge’ or a ‘mental content’ (even a ‘mental organ’) of a speaker. And that therefore the appropriate perspective for the linguist must coincide with some idealization of the speaker’s own. Linguistics ought to be mentalist and cognitivist, since language is an aspect of mind and cognition. (A similar focus is apparent in the work of non-generative scholars of a semiotic or hermeneutic cast of mind, e.g. Andersen 1973, 1989, Anttila 1989.) In fact the most radical statement I know of this position comes not from the hard-line ‘mainstream’ camp, but from two scholars of a quite different persuasion (Joseph & Janda 1988: 207). It is so beautifully explicit, and so wrong-headed, that it deserves quotation.

Since speakers do not have, they say, ‘notebooks full of charts and tables’ for performing morphological and general grammatical analysis, it follows that ‘linguists should at least think twice about proposing descriptions and theories arrived at through a heavy reliance on the aforementioned tools’. In a note they remark further that ‘if speakers . . . cannot consider more than a limited window of data, then linguists’ deviation from speakers in this regard is not only methodologically ill-conceived but also analytically and theoretically so’. If children, unlike linguists, cannot consider all avail-

<sup>7</sup> The classical source of the distinction (and the terms) is Saussure (1916), and it is traditionally called the ‘Saussurean dichotomy’. Taken with all of Saussure’s doctrinal baggage, it ends up making historical linguistics in the usual sense incoherent, since only states, not transitions, are a defined object of study (cf. Weinreich *et al.* 1968: §1, Harris 1977). But this is not the locus of the more important recent attacks and discussion, nor of this one.