I

Preliminaries: what is phonology?
And some related matters

1.1 The domain

Phonology, broadly speaking, is that subdiscipline within linguistics concerned with ‘the sounds of language’. More narrowly, phonology proper is concerned with the function, behaviour, and organization of sounds as linguistic items; as opposed to phonetics, which is a rather more ‘neutral’ study of the sounds themselves as phenomena in the physical world, and the physiological, anatomical, neurological, and psychological properties of the human beings that make them. Phonology, that is, is ‘linguistic’, in the sense that syntax, morphology, and to a large extent semantics are; while phonetics shades off at various points into neurophysiology, perceptual psychology, acoustics, and so on.

Really clearcut distinctions between related branches of the same subject are of course excessive; the lines aren’t really that sharp, as we will see. But we do need some initial partitioning of our subject-matter into manageable chunks. We must however be aware of potential points of contact, and even of areas where one sub-field shades off into another; so one might talk about ‘linguistic phonetics’, ‘experimental phonology’, and the like. (Chapters 5–6 are really about linguistic phonetics, and experimental phonology of a sort comes up in ch. 9.) We cannot, for instance, study the function of sounds in language without reference to their articulatory and/or acoustic properties (cf. terms like ‘dental stop’, ‘dark l’) – if only to use them as labels to tell us what we’re talking about. And similarly, we cannot study ‘sounds’ in a vacuum, with no reference to their linguistic function. Or rather, we can do these things for the sake of attacking individual, highly specialized problems; but not in terms of linguistics as a general and unified field of inquiry. For that we need cross-reference and connection.
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In the long run, neither a totally ‘abstract’ (i.e. non-phonetic) phonology nor a totally ‘concrete’ (i.e. non-linguistic) phonetics is likely to be of much interest. So, although the emphasis in this book will be on the ‘grammatical’ (in the widest sense) behaviour of sounds, I will always try to maintain – as indeed most serious theories of phonology have done – connection with the phonic properties of the material. Indeed, I will try to stress throughout that phonology is a very phonetic field: one might define it as the combination of universal phonetics (see especially chapters 5 and 6) and language-specific phonetics, with an emphasis on the interaction of these two areas with linguistic structure in general.

How does phonology relate to the whole of linguistics? Or, to narrow it a bit, how does the phonological side of language relate to the rest of it (semantics, syntax, morphology)? And how do all these linguistic descriptions capture this connection?

We might introduce the relation rather sketchily in terms of an important distinction made by Saussure (1916 [1959]: 122) between form and substance. A language in one sense is an abstract, formal set of relations (somehow, perhaps, represented in the brains of its speakers). But it is manifested in use as ‘substance’, as sounds, marks on paper, etc. To put it another way, still using Saussurian terms, every linguistic symbol (signe, ‘sign’) is a conjunction of two elements: a signified ‘concept’ (signifié) like ‘dog’ or ‘third person singular’, and a ‘vehicle’ embodying or carrying it, a ‘signifier’ (signifiant). The union of these is a ‘word’ or other formative. Thus (crudely) the concept ‘dog’ in a language is carried by a string of phonetic segments: [dɒg] in English, [hʊnt] in German, [fjɛ] in French.

Further, language is characterized by what some scholars have called a double articulation: at one level, we have essentially ‘meaningless’ elements (e.g. phonetic segments), with their particular rules of combination and other non-semantic properties. And at another, we have ‘meaningful’ combinations of these meaningless elements. But the relation between the meaningful and the meaningless is essentially arbitrary (Saussurian doctrine of l’arbitraire du signe): there is no particular reason why ‘dog’ should be [dɒg], as [hʊnt] etc. indicate. It is this essentially arbitrary relation that guarantees to phonology, as a ‘structural’ study, a considerable if not total autonomy: though, as we will see, the extent of this autonomy – the independence of phonology from semantics, and especially from
1.2 Areas of agreement

morphology and syntax – is one of the central debating points in theoretical discussion (see especially chs. 4, 9).

To go a step further, a language may be defined from one point of view as a set of sound–meaning correspondences; and a description or ‘grammar’ of a language is a formal object that states these correspondences. The particular range of items that go into the description, and the total set of phenomena that it can be held accountable for, are, again, matters of debate. Different theoretical frameworks suggest different versions of what an ‘adequate’ description is. In essence, though, we can say that phonology has a twofold task: (a) to explore the nature of the substantial (phonetic) realization or representation of the formal core of language, both in general and for specific languages; and (b) to relate this substantial representation to the form itself, i.e. determine its place in and relation to other aspects of a total description. I would see (b) as a subsidiary goal, though others would not (see ch. 9 in particular).

1.2 Areas of agreement

For as long as the structure of language has been seriously studied, there seems to have been general agreement about certain properties of the phonic medium it is realized in. Notably:

(i) Sounds in themselves are meaningless (see ‘double articulation’ above). There is no point to the question (independent of some particular language) ‘what does [v] mean?’

(ii) But within the structure of a language, either alone or in combination with others, sounds can carry meaning. Thus [v] means nothing in English, but is one form of the Polish preposition w ‘in’ ([yvarjave] ‘in Warsaw’).

(iii) Each language has an ‘inventory’ of sounds, selected from the whole range of possible human noises, which is (or may be) different from the inventories of other languages. Thus English doesn’t have voiceless lateral fricatives, but Welsh does, French has the vowels [y ø] but Swahili doesn’t, and so on.

(iv) There are patterns in the organization of phonic substance which vary from language to language: constraints on the distribution of sounds, predictability of certain sounds in certain positions, etc. Thus all final stops and fricatives are voiceless in German, Dutch, Russian, Polish; [ŋ] does not occur syllable-initially in English, but only after a vowel and before either pause, another vowel, or [k ġ];
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A voiceless uvular fricative [χ] occurs in French only after another voiceless segment ([kaχ] ‘four’); no syllable in Maori may end in a consonant.

(v) Two languages may have the same sound types, but use them differently with respect to semantic distinctiveness: both English and Hindi have voiceless aspirated and voiceless unaspirated stops, but this difference is not information-bearing in English, while it is in Hindi. So distinctions like those between Hindi [pʰə] ‘fruit’ and [pə] ‘moment’ are impossible in English, where aspiration is position-dependent, i.e. for most dialects with aspiration, stops are aspirated before stressed vowels unless [s] precedes (pit vs. spit), and often finally (pip, pit, pick), but unaspirated before unstressed vowels (upper): see §2.3.

(vi) There are also cases where sound distribution seems to be implicated in morphosyntactic structure. Thus in English the segments [æ]/[ɛ], [i]/[ε], [ε]/[ɛ] act as ‘sets’ or units in certain alternations: e.g. divine/divinity, sign/signify, crime/criminal; serene/serenity, clean/cleanliness; humane/humanity, grain/granary, etc. These alternations show certain similarities with those between (say) English aspirated and unaspirated stops, but differences as well; a linguistic description obviously has to cope with them, but precisely how, as we will see, is a problem.

Observations like (i–vi) above partly define the subject-matter of phonology; though careful examination leads to much more subtle and complex observations. And we can add some other points of general agreement:

(vii) There are limits to the number of sound types that can be used in human languages. For example, no language has consonants made with the tip of the tongue against the vocal folds, or vowels made with simultaneous spreading and rounding of the lips (for obvious reasons); but no language appears to have segments made with the tongue-tip against the left premolars, and the reasons for this are not obvious.

(viii) There exists a reasonable phonetic taxonomy (classification), including such items as places of articulation, airstreams, positions of the velum, states of the glottis, etc., which can be used to classify, nearly if not fully exhaustively, the sounds that occur in languages. And phonological descriptions ought to be responsive to this prior classification.
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(ix) Of the sounds that humans do make, only certain ones are ‘linguistic’: laughs, belches, grunts, shrieks are not linguistic items (even if their use can carry meaning of a sort). There is no direct mapping between a laugh and the proposition ‘I am amused’ of the kind that exists between the string of sounds [atemæmju:zd] and that proposition.

Given this preliminary sketch of our data-base and agreed matters to be accounted for, we can look at what aspects pose the most interesting descriptive problems, and how these problems have suggested theories about both the details and the overall organization of phonology. In particular, we will be concerned throughout this book with a number of basic questions:

(i) What are the units of phonology? Just ‘sounds’, or something else (larger or smaller)? Is there only one basic type of unit, or more? (chs. 2, 5–6, 10, 11.)

(ii) What are the principles of organization controlling the units in (i)? (chs. 6, 7, 8–10, 11.)

(iii) How much abstraction, idealization, etc. will be needed for adequate description? Are we to be content with simple listing of things we perceive, or are there ‘deeper’ principles involved, which may require fairly or highly abstract theoretical models? (chs. 2, 3, 4, 9.)

(iv) Given answers of some sort to (i–iii), where is the dividing line between what is ‘truly’ phonological and what is morphological, syntactic, or semantic? In particular, where do things like the divine/divinity alternation mentioned above fit in? (chs. 4, 9.)

(v) Given possible answers to any or all of (i–iv), what are the argument strategies for justifying them?

(vi) To what extent (if any) should phonological theory be tied in with psychological theory? Are the constructs of phonology intended to reflect ‘properties of mind’, or to be part of a larger-scale theory of human ‘mental structure’, cognition, etc.? Or is phonology ‘autonomous’, not necessarily or relevantly connected with anything outside itself, i.e. a study of ‘pure’ structure in a quasi-mathematical sense?

(vii) From (vi) arises the question of ‘external’ justification: to what extent (if any) is data from language change, language acquisition, language pathology relevant to phonological theory? Can internal issues (e.g. decisions as to which of two or more competing descriptions
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is ‘correct’ or at least ‘better’) be decided on the basis of external
evidence of this kind? (ch. 9.)

(viii) What do we want from a phonological theory/description
anyway?

I will not necessarily allude to all of these questions directly as the
discussion unfolds, but they will always be there in the background,
along with others that will arise from time to time. But they do
represent the key questions that animate current debate.

1.3 On facts, theories, and ‘truth’

This section may appear out of place in an introductory
textbook, as it deals with rather abstract matters of philosophy and
method. But I think it’s an error to expect students to be simple-
mindedly unaware of such things, even if they cause a bit of mental
indigestion. You can probably read this book quite successfully without
this section, but the material interests me, and the attitudes expressed
here show up in the way I look at the subject.

It’s a commonly held view that ‘facts’ are just lying about in the
world, and the way we make theories is by collecting these facts and
then seeing what theories they lead to. Nothing could be further from
the truth: in a way, there are no facts without theories. One might
even define a theory as – in part – a framework that tells you what
a fact is.

Let me clarify a bit. Even though the ‘theory-dependence of facts’
is a sound general principle (we will see it in operation as we go
along), certain facts are ‘privileged’: those determined by such low-
level and indispensable theories that we can take them as pre-
theoretical, i.e. ‘given’ by observation or perception. For instance:
it’s a fact (observational) that the further away an object is from the
eye, the smaller the image it casts on the retina. Hold your two hands
about six inches from your eyes, and then move your right hand a
foot further away. Are your two hands still the same size? If you
answer ‘yes’, as you probably will, you are making a theoretical
judgement. That is, the brain has a ‘theory’ that physical objects
retain constant size, and it disregards the actual evidence of the size
of the projected image. Size-constancy thus becomes a pretheoretical
fact for the user of a particular brain – even though some kind of
theoretical operation went into establishing it.
1.3 On facts, theories and ‘truth’

Consider three types of relatively pretheoretical facts about one variety of English:

(i) In pronouncing [f], the tongue is at rest on the floor of the mouth; for [v], it is somewhat raised towards the alveolar ridge.

(ii) The segment [pʰ] occurs before stressed vowels except after [s]; [p] occurs before unstressed vowels and before stressed vowels after [s].

(iii) The segments [k]/[s]/[ʃ] have a ‘special relationship’, in that they alternate in morphological paradigms: electric/electricity/electrician, critical/criticize, etc.

Virtually no phonological theory would take (i) as a genuine (phonological) fact, because there is no theory in which tongue position is ‘relevant’ for labiodental fricatives; but (ii) and (iii) involve variant distributions, under some apparent systematic control, of perceptually different items: the controls in (ii) are phonological, those in (iii) partly morphological. All phonologists would agree, I think, that (ii) and (iii) somehow ought to be accounted for in a description of English; and probably that there ought to be general principles to tell us how things like this should be treated in all languages; i.e. these phenomena are clearly of theoretical interest, and part of a theory of universal phonology – under the assumption that there are at least some properties that are invariant across languages (otherwise there would be no such discipline as phonology, but only ‘English phonology’, etc.).

But the question of how they ought to be treated is more complex, and here is where we get into debate: there is no general agreement as to whether things like (iii) are part of ‘phonology proper’, or belong to morphology, or come somewhere between (see chs. 4, 9). (Terms like ‘stressed’, ‘vowels’, ‘aspirated’ are of course also theoretical, but they belong to background knowledge, i.e. they come from a theory – phonetics – that is pretheoretical for phonology, not having to be justified within phonology itself. Phonology takes the classifications of phonetics as ‘factual’ input, part of what philosophers call its observation language.)

Throughout this book I will be looking at many different theories of phonological organization; most are in one way or another manifestly inadequate, and some may represent positions that nobody nowadays holds in their pure form. This may sound like a perfectly
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good reason for not considering them at all, but it isn’t, for two reasons: (a) no science is capable of giving final or ultimate answers to its questions, so that at any time it is not necessarily the case that all earlier answers and methods of getting them are superseded; and (b), because it is not possible to understand any body of evolving theory in isolation from its history.

So just because a particular theoretical stance seems at the moment to have been abandoned doesn’t mean that all its insights have been discarded. Even revolutionary developments in science don’t usually mean beginning again from the beginning; the history of any discipline involves a lot of old wine in new bottles (as well as new wine in old bottles, new wine in new bottles, and some old wine left in the old bottles). Even ideas that seem at the moment self-evidently true don’t arise out of nowhere, but are products of a long series of trial-and-error interim solutions to perennial problems, illuminated by occasional flashes of creative insight and inspired invention. Improvement or even radical restructuring of a theory doesn’t (or shouldn’t) imply the rejection of everything that went before.

As the philosopher of science Sir Karl Popper reminds us (1972), ‘progress’ in science or any other intellectual field is the result of ‘conjectures and refutations’. The story of phonology, like that of any other subject, is one of hypotheses proposed, subjected to criticism, defended, revised, rejected if need be, and so on. There are never any ‘decisive’ solutions, none that can with certainty be known to be right. The best we can ever know about a theory, and even this isn’t often attainable, is that it’s wrong: a theory that hasn’t yet been falsified or otherwise rejected has a certain claim on our confidence – until a better one comes along. As it will, given the boundlessness of human invention. I will therefore treat competing phonological theories in this light: the main difference between phonology (or any other branch of linguistics) and the ‘hard’ (natural) sciences is that a discipline concerned with human symbolic behaviour is so much more complicated than one dealing with inanimate nature, or non-human animate nature, that the opportunity for decisive refutation is much rarer. There are no episodes in the history of linguistics like the triumph of heliocentric over geocentric cosmology, and there aren’t likely to be.

This view affects the structure of this book as follows: since phonology is fluid and developing, it is not so much a set of facts
and ‘correct’ theories accounting for them as a set of problems and attempted solutions. In the present state of our knowledge, we are rather in the position of the blind men and the elephant in the old story: to the one who had hold of its tail, the elephant was ‘very like a rope’; to the one who had its leg, it was ‘very like a tree’, and so on. Since our elephant is very complex and elusive, it’s often necessary to approach a description of its overall organization by putting the reports of the blind men together – through detailed and intricate arguments about the structure of its individual parts. And since these structures are often not very obvious, we may have to approach them indirectly, and it will be impossible to give hard-and-fast precepts about how to analyse them, or even to give once-and-for-all definitions of what they are. Thus my approach will be based on particular problems, and the advantages and disadvantages of particular solutions that have been offered: above all, on arguments.

That is, since many of the things we will be talking about are unobservables, i.e. structural principles, hypothesized units, etc. that ‘lie behind’ the observable reality we are trying to fathom, we will have to talk in terms of whether particular systems of hypotheses do better or worse jobs of making sense of the data. If anything, that’s what the whole enterprise is about: making sense of things. This book will succeed if you come away with some idea of how difficult this is, and how interesting it can be.

NOTES AND REFERENCES

1.1 Arbitrariness: there are some marginal (relatively) non-arbitrary relations between sound and sense, e.g. onomatopoeia (imitation: moo, cluck, cuckoo), and various kinds of ‘sound symbolism’; but these are in no way central or basic.

Description: some theories claim that description isn’t enough, but that an adequate theory should ‘explain’ its observations. This is a contentious and difficult problem, which I will take up briefly in chs. 8–9. For discussion see Lass (1980) and the papers in Cohen (1974).

Phonic realization: I don’t imply that the form/substance relation means that phonic substance is the only direct realization of linguistic form. It’s a common error to assume that writing is merely an indirect manifestation of language, ‘secondary’ or ‘parasitic’, exclusively mediated through phonology. See McIntosh (1956), Householder (1971: ch. 13).

1.2 Phonology and psychology: for some schools of linguists the ‘repre-
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presentation of language in the brain’ is the central issue in linguistic theory. This is usually treated in the literature under the heading of ‘psychological reality’. For Chomsky and his followers this is what linguistics is about; for some of Chomsky’s opponents as well. For a committed Chomskyan view see Smith & Wilson (1979); for a critique of Chomsky see Derwing (1973), Linell (1979). For an elegant argument to the effect that psychology is no concern of linguistics proper, Matthews (1979). These are difficult issues, and you should probably not worry about them at this stage (especially as much of the literature requires a good deal of technical knowledge). I will return to these matters in §§6.1, 9.3ff.

1.3 ‘Science’: whether linguistics is a ‘science’ is much debated. My guess is that it isn’t, but I will occasionally use the term rather loosely. For literature on this difficult issue see Itkonen (1978), Lass (1976a: Epilogue), Ringen (1975). On progress in knowledge as a matter of conjectural solutions to problems, see Popper (1972, 1973); for an excellent introduction to such general problems of the philosophy of science see Chalmers (1978).