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PHONOLOGY is the branch of linguistics concerned with the articulatory and auditory domain of grammar, that is, with the theory of what Austin called phonetic acts. Its subject-matter links with, but is distinct from that of syntax, semantics, and pragmatics. It covers the forms in which the sound of words are kept in memory and the manner in which the motions of speech organs are shaped by grammar.

Unlike syntax, semantics, or pragmatics, (but like closely related morphology) phonology has been largely ignored by philosophers. Philosophers, on the whole, consider the fact that natural languages are primarily spoken rather than written as of little interest for what Dummett calls a "philosophical explanation" of language. This attitude stems largely from the mistaken but widely held view that spoken signs are arbitrary sounds whose individuating traits are those of noises. On that view, utterances contemplated apart from their semantic and syntactic features are merely tokens of acoustical types, bereft of grammatical properties, fully described by the physics of noises, and available for human communication simply because humans can perceive and produce them; there is nothing intrinsically linguistic about them. Nor is this attitude an accident. Historically, philosophers have had little incentive to reflect on the sound aspect of language. Most belong to traditions that admit no crucial differences (except perhaps those that pertain to pragmatics) between natural languages on the

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one hand and, on the other, notational systems developed by scientists, by mathematicians, or by philosophers for the elaboration of their theories. Such notational systems have a syntax and a semantics of sorts, but they have no phonology. Their constituent elements are typically spatial ideographs that share little with the phonological structures of natural languages. Studying language with such a bias offers few reasons, if any, to focus on what is spoken rather than written. It can, however, entrap one into a false conception of linguistic signs, so false, in fact, as to seriously weaken philosophic doctrines built on it.

Phonology rests on a series of presumptions — each supported by a vast body of observations — which together entail that the sounds of natural languages are not arbitrary human noises, on a par with grunts or snorts, whose individuating attributes lie entirely outside the domain of grammar.

The first such presumption is that when people acquire a word they memorize the underlying phonological representation of that word, a representation which defines — but often only partially — how the word is pronounced. These representations have the structure of linearly arrayed discrete timing positions that are assigned pointers to articulatory organs (lips, blade of tongue, dorsum of tongue, root of tongue, velum, vocal cords) implicated in the pronunciation of the word, and pointers to actions these organs

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execute during speech. The first timing position for the English 'pin', for instance, points to the lips, the vocal cords, the velum, full closure of the first, stiffening of the second, and non-lowering of the third.

A second presumption is that these pointers (called phonological features) on timing positions are drawn from a finite repertoire, common to all languages, and that they are combined within and across timing positions in rule-governed ways. Some rules are common to all languages and reflect innate linguistic endowments, others are language-specific, and reflect the influence of linguistic exposure. No language, for instance, avails itself of nasal snorts. French admits rounding of the lips in combinations of features that English excludes (thus the sound *ü* in French but not in English). Korean, unlike English (except for *h*), admits aspiration in underlying phonological representations. German, unlike English, admits initial sequences corresponding to sounded *k* followed by sounded *n*. All languages assemble features in similar (three-dimensional-like) structures.

A third presumption is that underlying phonological representations, in isolation or when compounded in complex words, are subject to rule-governed processes which add, subtract, or modify phonological features, which group them into syllables, feet, and prosodic words, which assign stresses and (in some languages)

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tones, and which ultimately yield ~~final~~ articulatory instructions, so-called surface phonological representations related to, but often very different from, the underlying representations in memory. Processes of this sort account for the fact that e.g. 'leaf' occurs as 'leavz' (with v instead of f) in the plural, or that 'serene' is pronounced differently when alone than when a constituent of 'serenity', or that 'p' gets aspirated in 'pin' though not in 'spin'. The details of these rules, the manner of their application, the universality of their formats, and the options fixed by different languages, are all objects of intense research and controversies. But the evidence in behalf of their reality seems irrefutable.

Phonology is of philosophic interest not only because it brings into question analogies between contrived notational systems and natural languages but also because it raises conceptual issues of its own. Two can be mentioned here.

First. Individual spoken utterances are analyzable in both acoustical and phonological terms. No generalizable exact correspondences between these two analyses are known. None may be forthcoming. For instance, nothing acoustical corresponds to word division. How can this dualism be reconciled? Is there a cogent sense in which the objects of speech production are the same (or belong to the same types) as those of speech perception? Offhand

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the problem resembles that raised by other events amenable to multiple descriptions. But in this case, solutions must be attuned to much that is already understood about both phonology and acoustics. It is not a simple task.

Second. Phonological theory associates multiple representations with each utterance — including an underlying representation and a surface one — and it describes them all in the same notation. Surface representations can be conceptualized as instructions (or intentions) to move articulators in certain ways; their ontological status, though unclear, is at least comparable to that of other familiar cases. Not so the other phonological representations. They don't have familiar analogues. The semantic domain of phonological notation therefore can't be ontologically homogeneous. Furthermore, part of that domain is deeply perplexing.

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Bibliography

For a complete bibliography as well as an introduction to the field consult Kenstowicz, Michael, Phonology in Generative Grammar, Cambridge MA 1994. For recent history consult Anderson, Stephen R., Phonology in the Twentieth Century, Chicago 1985. There is little philosophic literature on the topic. See however Quine, Willard Van Orman, Word and Object, Chapter III, 18, and Bromberger, Sylvain and Halle, Morris "The Ontology of Phonology" reprinted in Sylvain Bromberger, On What We Know We Don't Know, Chicago and Stanford 1992.

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