LINGUISTICS, PHONETICS, AND FIELD-WORK

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The present, rather loosely structured and causerie-like paper is an attempt to summarize some of the reflections, expectations, and frustrations which have marred the author during several years of pend-ling between instrumental phonetics and theoretical and descriptive linguistics, and during many years of practical field-work. The main emphasis is on the - possibly futile - question: is field-work data likely ever to be of any interest to instrumental phonetics, or vice-versa? No attempt is made to deal systematically with general methodological aspects of field-work (for this reason also, refer-ences to the literature on field-work techniques are totally omitted). Moreover, what is said below about conditions to be met in connection with instrumental analysis, will be trivial to most readers. Never-theless, it may be worth while spelling out what it is that causes field-work activities and instrumental phonetic research to exhibit little or no mutual interaction in contemporary language study.

I. LINGUISTICS VERSUS PHONETICS

What are the goals of linguistic research? What are the goals of phonetic research? At times the issue is stated as if those interested in language come in two totally different species: Linguists and Phoneticians, the assumption being that the re-search paradigms and interests of these two species of mankind overlap so little that there are limited possibilities of fruit-ful interaction. Admittedly, it is not difficult to establish a polarization between two extremes: the linguist who is de-voted to abstract formalism and considers phonetic detail ir-relevant, and the phonetician who is totally absorbed in phys-ical or physiological measurements. Researchers in the two

camps (henceforth referred to as "linguists" and "phoneticians",
although the present writer, like many others, does not see
this as a real dichotomy) may feel that their research inter-
ests overlap only (if at all) in the very general sense that
it may be considered a common research objective of theoretical
linguistics and instrumental phonetics to contribute to our
understanding of the basic principles and constraints under-
lying human language. Some linguists and phoneticians may also
agree on searching for explanations of why there are non-
trivial universal constraints on what is a possible language,
or a possible linguistic performance, but they may find that
they differ profoundly in their assumptions about where to
look for such explanations, and in their understanding of the
very concept of Explanation. (The difference of opinion may
extend also to the criteria to be met in order for a general
feature of languages to count as a universal.)

The possible polarization referred to here has to do with a
parameter of abstractness, this term being understood here in
a very general sense. Phoneticians anchor their research in
physically observable and hopefully quantifiable phenomena.
Some linguists would claim that what counts in their analysis
of raw data is discreteness from the point of view of semiotic
function, viz. on the one hand syntagmatic discreteness (seg-
mentability in one or several hierarchical layers) and, on the
other hand, paradigmatic discreteness (distinctness and member-
ship of paradigms). And then there are theoretical linguists
whose real object of study is constituted by highly generalized
and highly abstract relationships between abstract entities,
and to whom the observable "surface" data are only marginally
interesting in that they reflect these abstract structures.
(This characterization of "abstractness" in linguistics is,
of course, grossly over-simplified in that it refers solely
to the relationship between linguistic form and phonetic sub-
stance and totally disregards related issues in semantics and
pragmatics. Moreover, discreteness is only one among several
possible components in the semiotic functioning of linguistic
entities. Hopefully, this over-simplification may be tolerated
for the sake of the argument.)

Needless to say, it is not generally true that phoneticians
and linguists fall into totally separate categories in terms
of "abstractness": there are phoneticians who take an interest in
taxonomies and sometimes quite abstract formalizations of
phonetic findings, and there are linguists who want to "hug
the phonetic ground closely" (Ch.F.Hockett), also cf. the recent
controversies about abstract versus "concrete" or "natural"
trends in phonology. Nevertheless, it is widely held that
there is a deep abstractness schisma between (much of) modern
linguistics and phonetics.

There are other parameters than "abstractness" which are es-
sential to a taxonomy of research activities in the universe
of language study (parameters which are not necessarily orthog-
onal to each other or to that of "abstractness", but which
nevertheless merit separate mentioning). One such parameter

has to do with the question of language specific versus universal phenomena, and there is another, closely related distinction to be made between descriptive statement and general theory. It should be noted that on these issues there is no categorial difference between the full-fledged linguistic theoretician and the full-fledged phonetic experimenter: it is not possible to characterize the work of the latter as being generally less theoretically oriented than that of the former. The phonetician who works in the framework of certain (possibly rather speculative) assumptions about the temporal organization of speech in the central and peripheral nervous system of the speaker, or about the mechanisms underlying speech perception, is in a sense theorizing just as much as the linguist who posits universal principles of markedness, prosodic hierarchization, or rule application.

It is true, however, that the hypothesis-forming phonetician and the linguist may differ in the kind of corroborative evidence they look for. The experimenting phonetician shares the concepts of natural sciences and of experimental psychology as to what constitutes empirical evidence for or against a hypothesis. The theoretical linguist may take a stand anywhere between this strictly empiricist attitude and another extreme, viz. that of substituting labels and definitions for real evidence. In actual practice most linguists working with spoken language place themselves in between these extremes, drawing more or less on the speaker-listener's (possibly their own) intuition about the language as primary empirical data. Other linguists programmatically look for substantive evidence for universal and language specific structurings, searching in areas such as language acquisition, language change, slips of the tongue, pathological speech disturbances, and psychological testing of normal language behaviour. However, there is so far no generally recognized paradigm for integrating such studies into theoretical linguistics, and this is one reason why the study of language is as far from Unity of Science as ever.

Purely descriptive studies of languages by necessity furnish the main input to the formation of interesting hypotheses. This is equally true inside and outside of phonetics proper. Linguists may perhaps think that instrumentally oriented phoneticians tend to take delight in the very craftmanship of recording and processing physical or physiological data, and that they do not always bother enough about the relevance of their meticulous measurements in the wider context of language sciences. Phoneticians, on the other hand, may perhaps think that linguists prefer to recede into a sphere of abstraction in which the awkward and conflicting evidence furnished by real and unbiased data sometimes presents more of a nuisance than of a welcome challenge. Of course, neither of these two prejudices is fair (although they may reflect a real enough tendency toward a difference in scientific temperament). And more interestingly, the attitudes of linguists and phoneticians toward the use of real data from real language use is in fact not at all in line with the hypothetical contention one might be tempted to forward on the basis of the above-mentioned

characterizations of linguists as abstractionalists and of phoneticians as empiricists, viz. the contention that phoneticians are necessarily more interested in such <u>real</u> data than are linguists.

The hypothetical contention might run as follows: Phoneticians deal with language performance and should hence prefer raw data reflecting the unconstrained use (production and perception) of language. Linguists are in the first place concerned with linguistic competence (performance phenomena being a secondary object of study which is derivable from the study of competence), and hence are better off with idealized data without interference from communicative situation contexts or from variability in speaker (or listener) performance. - Off-hand this may perhaps seem a meaningful contention, and even a legitimate difference of research strategy, but clearly that is not the truth of the matter. Anyone working seriously and responsibly on syntax, for example, must realize that one does not get very far - if the statements are to represent a reasonable degree of adequacy - unless one looks (also) at genuine, non-monitored and non-idealized data (be it real texts in written language or real specimens of spoken language). Concoction of sample sentences serving to reassure the linguist of the correctness of his assumptions is convenient and useful for restricted purposes, but it is not <u>enough</u>, not even if the assumptions are derived from the most fashionable general theory of syntax. There may be linguists who prefer to remain in the belief that the language they have chosen to study (read: chosen to use for illustration of some general point) is the way it should be according to theory, rather than try to find out how it really is, but this cannot possibly constitute a legitimate research strategy, and probably all linguists would emphatically deny that they take such an attitude toward their data. And indeed, in descriptive syntax as much as in any other field of language study (and indeed much more than in phonology, for example) extensive study of real texts has always been the norm. Moreover, there has been a rapidly increasing interest in the study of texts as a component of communicative situations, the study of text coherence, and so on. Unfortunately, this trend has, so far, not manifested itself equally strongly in phonology, with the result that the study of prosodic phenomena is sadly lagging behind, because linguistic theory has not been developed sufficiently to cope with the intricate interplay between pragmatics, semantics, syntax, and phonology-phonetics which is so characteristic of prosodic phenomena at the sentence level.

So much in order to underline the inadequacy of idealized data as the only input to linguistic study. What then about the phonetician and his data? Phoneticians are of course basically interested in the issues mentioned above, and when dealing with prosodic phenomena, for instance, the instrumental researcher tries to take the complex scenario into consideration in the design of his techniques. However, there is a very serious difficulty which is rooted in the very nature of instrumental research: with the use of quantitative methods it is hard to come to grips with data varying

in very complex fashions and involving factors which are in part inaccessible to quantitative treatment with present-day techniques. How is one to present quantitative data on sentence intonation and sentence rhythm, for instance, if the input sentences vary in segmental composition, in focal stress placements, in the use of intonation perturbations or hesitation phenomena to indicate speaker's attitude, and so on? Even at the level of segmental studies such factors as sentence length, sentence rhythm, and expressive lengthening may totally change the picture, and the same is true of differences in the distinctness level aimed at by the speaker (which may even be rapidly varying within an utterance, some items being enhanced and others slurred for the purpose of effective communication). On this background it is no wonder that, paradoxically, the phonetician - more than the explicitly data-oriented syntactician - tends to work on idealized data such as stereotype series of words, phrases or utterances spoken in suitable (invariant) contexts and designed to be as devoid af variable pragmatic factors as possible. The enormous popularity which nonsense words enjoy in phonetic research is witness of this trend. This restrictive research strategy is certainly legitimate as long as the issue is defined in terms of parameters (of sound production, acoustics, or perception) such as tongue root advancement, VOT, vowel duration, intrinsic pitch of vowels, or difference limens for formant frequencies, but obviously one has not said all there is to be said about the physical aspect of aspiration or vowel length in a language by measuring test words of certain types in stereotype utterances. Similarly, by making identification and discrimination tests on specially designed stimuli one certainly has not said all there is to be said about the perceptual categorization of consonants with varying amounts of aspiration or vowels with varying durations in real speech situations. One has, in fact, said rather little, and the experimenting phonetician knows this, but nevertheless he feels it is necessary to stick to the type of data he can handle with rigid methods, viz. data with few and well-known variables.

It should be emphasized also that the discovery and description of physiological and auditory mechanisms and constraints operating in speech production and perception, which is a major goal in general phonetics, can proceed quite far on limited types of data and rather require that the sampling of data be rich enough to permit satisfactory statistical treatment. It is, moreover, important to be able to distinguish between properties of speech production and perception which are strictly universal and organically conditioned, and properties which are sensitive to differences in linguistic patterning (some phoneticians tend to make too little of this distinction, perhaps). But in order to study the role of linguistic patterning it is often more immediately rewarding to take a narrowly defined type of data and study what happens with comparable data across a variety of languages than to study what happens across all kinds of contexts within one language.

One potential danger of the approach described above is that in narrowing his scope the phonetician may suppress his sense of proportions vis-à-vis natural language or, put differently, may define the goals of phonetics in a self-assuring way, so that phonetic research tends to circle around a limited set of standing issues forming their own closed universe without the researchers being sufficiently responsive to challenges from linguists who take a different approach and therefore raise quite different issues which <u>also</u> belong within the sphere of interest of phonetics in a broader sense. (It should not be overlooked, however, that this very tendency to keep circling around a set of highly specific, live issues is - at least equally if not more - characteristic of modern theoretical linguistics.) More generally speaking the phonetician has to face the fact that he is caught in a situation which is not very inviting from the point of view of sentence level phonetics: there is a kind of trading relationship so that one can either study some (artificially) limited aspects of linguistic performance by exact methods, or one can make relatively loose qualitative statements on the basis of observations of linguistic performance in a more realistic setting.

As stated earlier, <u>linguistic</u> research may suffer even more if its input is restricted to sentences or wordforms which have been filtered through the analyst's prejudices, but it is not all that simple to take in "unretouched" data in linguistics either. Non-monitored spoken texts are difficult to handle, especially if they stem from a complex communicative situation, and it is no wonder that the vast majority of syntactic studies have been done, and still are done, on written rather than spoken language. (Needless to say, both kinds of studies are necessary, and one cannot ever substitute totally for the other.)

II. FIELD-WORK DATA

Now, what kinds of input do linguists actually use? It is essential to distinguish here between <u>first-hand data</u> (data gathered by the researcher himself) and <u>second-hand data</u> (data gathered by somebody else). Along another parameter it is essential to distinguish between <u>non-monitored</u> and <u>monitored</u> data gathering, the former being what happens if, for example, the researcher taps telephone conversations or takes literary texts as data for a study of written language, and the latter being what happens if the researcher works with an informant. Along a related parameter there is a highly significant distinction between <u>reproductive</u> performance (e.g. when retelling a piece of oral tradition whose style is fixed by convention or, at the extreme, when reading a written text aloud) and <u>creative</u> performance (ranging from the restricted creativity involved in giving equivalents to sentences put in another language to the unlimited creativity involved in spontaneous speech). Monitored data, moreover, may represent <u>non-interactive</u> data gathering, e.g. if the informant is asked to render a narrative text or engage in a conversation with somebody else,

or it may be a case of <u>interactive</u> data gathering, viz. if the
researcher directly enters the process by which the linguistic
material is generated, e.g. by putting questions to the in-
formant, asking about his acceptance or non-acceptance of cer-
tain data, or having him record specimens worked out in advance.
- Strictly speaking the user of field-work data should be con-
scious about the implications of using one or another kind of
data.

Many linguists take much less interest in data gathering than
in linguistic generalizations and, consequently, tend to use
second-hand rather than first-hand data. In phonology this may
be practically hopeless unless the source one consults already
represents a systematic linguistic analysis using consistent
criteria such as distinctness. In syntax it may be the other
way round: a source rich in raw data with little or no system-
atization being forced upon the data may often be less mis-
leading than a selective and fully formalized presentation, if
the purpose is to make a "more insightful" <u>restatement</u>. Often
enough, such analyses involving sweeping <u>generalizations</u> on
the basis of very limited material may eventually turn out not
to be warranted by the language as it really is, apparent new
insights being artifacts of the accumulation of skewnesses
caused by repeated restatement on the basis of the same primary
material. Needless to say, the danger is imminent if the source
consulted is itself a case of highly selective use of data
stemming from interactive gathering. Such accumulation of
errors may, of course, happen in all fields of linguistic re-
search, and it certainly happens also in phonology (this is
one reason why it is necessary to be somewhat cautious in using
typological reference manuals, impressive and immediately use-
ful as these may be).

It would help if it were always clearly stated in papers deal-
ing with phenomena in specific languages on what kinds of data
(in terms of parameters such as those mentioned above) the
statements are based and, if the paper contains illustrative
data, what is the status of the data included in the paper.
Nevertheless, it cannot be refuted that the use of second-hand
data is always somewhat problematic whenever the data must be
sought in a presentation <u>of the same kind</u> as one's own study,
as when one takes a specimen of phonological or syntactic ana-
lysis and restates it into a phonological or syntactic analysis
of the second order. Second-hand data is less controversial
(though certainly not unproblematic) in case it is drawn from
a <u>different</u> kind of source (as when items from dictionaries
are used in comparative studies), and indeed, real progress in
linguistics would be impossible without such use of the work
of one's predecessors or colleagues in other linguistic fields.
It goes without saying that it is <u>always</u> preferable to have a
first-hand knowledge of the language under study, and also the
use of other linguists' materials is greatly facilitated if one
has done field-work - including interactive gathering - oneself.
The importance of this is sadly under-estimated by many an
eminent representative of contemporary linguistics.

Linguistic field-work is typically predominantly interactive,
the process of gathering going hand in hand with systematic
analysis involving (preliminary) categorization and formula-
tion of tentative generalizations. Linguists and phoneticians
with little or no interest in field-work should realize that
this is indeed the most crucial phase in linguistic research.
This is where decisions are made which have consequences for
all following steps in the analytical treatment of the data
and for the generalizations based on the processed data. It
is in the very first phase, when the field-worker sits face to
face with his informant, that all kinds of errors may be made,
and hopefully may be cleared up. Unnoticed errors made at
this stage are the most fatal ones since the process of faulty
decision-making at the stage of data gathering is irreversible
if there is no independent evidence showing that one went wrong.
This may not seem so serious if it is an easily accessible and
perhaps well-known language, but with less easily accessible -
but typologically or genetically highly interesting - languages
there is a heavy burden of responsibility both on the field-
worker and on the linguist who squeezes the available second-
hand material in order to get answers to questions which the
material may not really live up to. New insights may - and
often do - emerge from reconsideration of earlier language
descriptions, but basically, it is irresponsible to claim that
one is making generalizations about a language if in fact one
is making generalizations about some particular description
of that language.

As emphasized already, the professional linguist doing field-
work may go wrong, and he cannot be sure that he always dis-
covers (even grave) errors. Neither can those who draw on his
presentation. It is often very difficult to do field-work.
There are many reasons for this, also reasons which are beyond
the control of even the most well-trained linguist or phoneti-
cian. What then if anthropologists or missionaries with little
or no linguistic training furnish the data? What can the lin-
guist do if a field-worker with no linguistic background re-
turns from visits to a remote and perhaps nearly inaccessible
area, carrying with him unique specimens of a language which
is of crucial interest to the linguist in question?

In a sense this situation is rather transparent, though cer-
tainly most frustrating: we know that from a linguistic point
of view the data gathering was not done professionally (just
as the anthropologist may find that linguists do not always
ask the right questions in their data gathering!), we have no
illusions as to the adequacy of phonetic transcriptions, and
our attitude is to try to make the best of the data with all
its shortcomings. And then there is one possible virtue of
the material: since the field-worker did not start out with
any theoretical linguistic bias (or at least not with the
same biases as the linguists using his data), there is a
genuine chance that his data may be a less deceptive specimen
of the language than data gathered with specific purposes in
mind by a trained linguist. The linguist's data may be in-

comparably better in all other respects, and provided that the
linguistic field-worker is sensible enough to supplement his
strongly monitored data (obtained through steady interaction)
with specimens of narrative or fully spontaneous speech one is
of course on immensely much safer ground with such data. But
the basic problems of how to do proper field-work remain.

Whoever has done field-work himself is at least painfully aware
of the shortcomings of his own data, and of the extent to which
the interactive approach may distort the data. Probably many
researchers have, on some occasion, suddenly come to realize
that they were forcing the informant into a narrow scheme of
linguistic performance which seemed so artificial to him that
he either revolted or resigned, in the latter case suppressing
his own intuitive judgment of appropriateness, acceptability
or grammaticality (whatever that means) of sentences presented
to him. Or - if the issue was a phonological one - the in-
formant was perhaps losing interest in keeping track of what
is "same" and "different", or getting confused as to what
"same" and "different" means (sameness of sound?,of meaning?).

Interactive data gathering may at times be an extremely success-
ful undertaking. At other times everything may go wrong: the
researcher may be persistently on the wrong track on some vital
point, he may overlook crucial bits of data, make errors out
of sloppiness, and so on. - Many a breakdown in the researcher -
informant interaction is caused by differences of expectation.
The "naive" informant may expect the researcher to behave like
any sensible person who is more interested in the information
conveyed by speech than in the medium of communication as such.
Some informants can be taught to take the professionalist's
attitude toward their own language, others may come to find
it funny that they speak the way they do, and take the whole
thing as a game. Still others may not ever become "good" in-
formants in any sense of the word.

The worst danger encountered in field-work is the generation
of artifacts by informants being confused by leading and too
persistent questions. It is, indeed, very unpleasant to dis-
cover, in the middle of a field-work session, that the in-
formant is taking more efforts to please the linguist who is
pestering him than to perform correctly and consistently in
his own language, and that maybe some of the items one care-
fully recorded are gibberish to the informant when they are
read (or played back) to him later. This is painful for the
linguist, and it may be detrimental to his work if it happens
too often and perhaps passes unnoticed at times. But it may
be no less embarrassing to the informant.

The field-worker must be aware all the time that he is dealing
with a human being, and he should not only do his best to make
his informant "function" properly but certainly also pay due
respect to the integrity of this other person. It must be re-
membered that the field-work situation may be utterly strange
and perhaps a little unpleasant to the informant, and that in
spite of this strangeness and unpleasantness the informant is

- at least part of the time - doing his best to assist in the
documentation of his own language. He may not see the point
of the task, but he may be very interested in his own language
and conscious about his own linguistic usage. It may appeal
to him that his language is important enough for people to
come from far away to learn about it. Then again some inform-
ants are extremely aware of the fact that in getting involved
in field-work they cause something to happen to their language.
If the researcher is not careful and responsible enough in his
attitude toward the target language the informant may feel
compelled to revolt on behalf of his language ("We do not say
such things to each other!", "You twist my language!", etc.).
Many a syntactician suggesting phrases which are pragmatically
silly or totally artificial must have experienced this. There
most certainly is an ethical aspect of field-work, and it is
not only a question of decent behaviour: it may also be crucial
to ultimate success if one really wants genuine language data.
In short: good field-work is a demanding task.

III. FIELD-WORK DATA AND
PHONETIC ANALYSIS

Where does all this leave phonetics? The practical phonetician
has an indisputable role in field-work involving phonetic tran-
scription and preliminary phonological analysis on the basis
of accurate impressionistic assessment of the sounds and sound
sequences heard. So any field-worker should at least be well
trained in practical phonetics. But what about the instrumen-
tal phonetic aspect?

It should appear from what has been said above that there is
a kind of incompatibility between field-work and instrumental
phonetics. Thus the issue may seem a pseudo-issue, the most
reasonable answer being that field-work data should not be
considered relevant input to instrumental study. To the lin-
guist this may not be too much of a disappointment: he probab-
ly did not expect instrumental phonetics to facilitate or
corroborate his phonological analysis anyway. The devoted
laboratory phonetician may be equally at ease since he has
interesting challenges enough and moreover feels at ease only
with data generated and processed under ideal laboratory con-
ditions. Why, indeed, bother about instrumental approaches
to the analysis of field-work data?

Although there is much to be said in favour of this total
segregation of field-work and instrumental phonetics one should
not overlook the possibility of getting stimulating suggestions
by combining the two approaches. In spite of the misfit be-
tween field-work data and research methods in instrumental
phonetics it may well be the case that careful phonetic study
of whatever data is available may help to sort out what is
going on in areas which are not easily accessible to a con-
sistent phonemic analysis, in particular certain aspects of
prosodic patterning (such as complex interplay between tonemes
and sentence intonation). Trivial types of phonetic speci-

fication, such as formant frequencies of vowels, or presence
versus absence of vocal fold vibrations in a stop consonant,
may also help to put the field-worker's qualitative descrip-
tion on safer ground, because of the experience we have as to
the normal relationship between impressionistic and physical
or physiological parameters. In particular, it should not be
overlooked that an optimum of phonetic specification may be
desirable if the linguistic data are used in the context of com-
parative studies and linguistic reconstruction.

In connection with hypotheses about sound change it is essen-
tial to know exactly what is the phonetic reality in the pres-
ent state of one or several related languages; if such in-
formation is not available it seems rather futile to speculate
about the phonetics of reconstructed phoneme systems. In the
study of tonogenesis, for example, one should know what typi-
cally happens in the larynx, and how the fundamental frequency
is typically perturbated under specific articulatory conditions,
in thoroughly studied languages, and in addition one should
know as much as possible about these physiological and physical
aspects of the pertinent syllables in the particular languages
under consideration. Otherwise it may be that crucial parts
of the linguistic argumentation are based on pseudo-phonetic
evidence, which is indeed worse than no evidence.

As for phonetic documentation the ideal situation is, of course,
if informants can be brought to a place with laboratory facil-
ities (be it a phonetic laboratory proper or a hospital with
relevant equipment). To a limited extent, articulatory phenom-
ena can also be studied instrumentally in the field if the
phonetician is ingenious enough in selecting portable though
adequate equipment. Altogether, however, it is not very
common that phoneticians endeavour to create such a happy
symbiosis of linguistic field-work and instrumental research
as has been done by Peter Ladefoged in his study of African
languages. It must be conceded that there are field-work si-
tuations which are not very favourable to instrumental research.
In working with a tribe of very shy people living in a remote
area one faces several difficulties in addition to the remote-
ness: the informants may be afraid of instruments, there may
be severe difficulties in communicating, which adds to the
awkwardness of the whole situation, and so on. Even taking
a photograph may not be entirely unproblematic. Otherwise,
it is self-evident that general visual inspection, corrobo-
rated by photography, must be the basic approach used to
supplement the auditory impression (and its source of
corroboration: the tape). Otherwise, instrumental techniques
may come in later, viz. in making acoustic analyses of the
tapes brought home from the field sessions. Strangely enough,
this may turn out to be the most controversial issue.

To the phonetician such instrumental processing of material
which is ill designed for the purpose and perhaps technically
rather imperfect may turn out to be a most unrewarding task.
However, it should not be overlooked that it may so happen

that one can get a first notion of some highly interesting
feature whose articulatory nature may be tentatively inferred
from the acoustic signal. Limited and perhaps non-quantifiable
observations on remote languages may well trigger off a burst
of research activity on some hitherto neglected phonetic
mechanism. And ideally, it would seem natural to strive for an
all-round linguistic documentation of the language under study,
comprising also phonetic detail to the extent that it can be
at all specified. There are significant phonetic contributions
of this kind for some language areas (such as Peter Ladefoged's
study of African languages), but it is certainly not the norm
in descriptive studies. More often than not the field-work is
taken care of by non-phoneticians, and it is a source of
enormous frustration to the phonetician who is called upon to
assist in getting something out of bad tape recordings, let
alone to provide data on physical parameters of sounds on the
basis of such tapes, and who has to explain that it is really
not worth while. This is so much more unfortunate since it
would be desirable if the linguistic field-worker, even if he
is not a phonetician, were stimulated to ensure good data for
preliminary phonetic observations rather than getting the im-
pression that this is not worth while anyhow. What can be
done to make the a posteriori task of extracting phonetic in-
formation from tape recordings a less forbidding one?

IV. REQUIREMENTS ON FIELD-WORK RECORDINGS

Let us assume that the field-work is done under the most ad-
verse conditions in some remote village. There is then little
that can be done as far as primary observation of speech pro-
duction is concerned. Perceptual studies, in turn, are large-
ly confined to simple playback experiments serving as an aid
to phonemic decisions. We are, then, left with impressionistic
transcription and acoustic recording, the latter being always
designed to make it possible to listen to the language on
later occasions and sometimes also designed to permit some
instrumental processing. Needless to say, it is essential
that the recordings are both technically good and appropri-
ately edited.

Before going into the subject-matter of good tape recording
it must be emphasized that for the purpose of phonetic tran-
scription even the best tape recordings can never wholly sub-
stitute for the first-hand impression which the field-worker
gets out in the wilderness, or wherever the work takes place.
This should be understood by field-workers such as anthro-
pologists who perhaps feel that they have imperfect training
in phonetic transcription and therefore tend to scrap their
own notes as soon as something more authoritative is available.
The field-work situation is unique in that it offers three
enormous advantages, viz. (1) that the researcher can hear
the speech sounds without any kind of distortion (except for
extraneous noise, which, however, is normally much less dis-
turbing in the field-work session than it is afterwards on
the tape!), (2) that he can observe the person's mouth and

whole appearance during speech, and (3) that he can ask the informant to repeat as much as necessary (the variability occurring in such repetitions being often more illuminating than the exact repetition of each token one gets from playing a tape over and over again). For such (and other) reasons transcriptions made during the field-work sessions should never be by-passed in favour of transcriptions made afterwards on the basis of tapes alone, no matter how careful the latter may be. The field-work notes may be faulty and should be used with much caution, but they often contain information (e.g. on the place of articulation of unreleased final stops) which may be virtually impossible to retrieve from a tape, especially if the researcher does not know exactly what to listen for.

In line with what has been said above it seems strongly advisable always to make dual documentation, viz. by supplementing transcriptions made in the field with (simultaneous or subsequent) tape recordings including the same types of data, which can then be transcribed at leisure afterwards. - In the most recent field-work project in which the present writer was engaged, we were three linguists/phoneticians working together, each taking down all data in phonetic transcription, and each monitoring a separate tape recorder (so as to make sure that at least one recording was reasonably satisfactory for each piece of data). We did not feel any undesirable redundancy in this approach, which was highly interactive in the sense that transcriptions could be compared throughout the sessions, and decisions could be checked over again and perhaps revised.

The ultimate question, then, is what is required in order for tape recordings from such "primitive" field-work to be reasonably satisfactory to the phonetician. Obviously there are requirements both on the quality of recording and the type of data recorded.

    Quality of recording is a deplorable chapter in the history of field-work. First of all, much field-work has been done over the decades by researchers who did not realize how bad their recordings were, and how much better they might have been if certain precautions had been made. It is a sad experience when somebody proudly plays samples of a language he or she has recorded far from civilization, with people whose language is near extinction, and it then turns out to be very hard for others to hear what is going on on the tape (the situation may be reminiscent of that in which a phonetician demonstrates synthetic speech to his colleagues, who are utterly incapable of hearing what the machine is supposed to say).

There is an incredible amount of variation in the equipment used, ranging from professional reel recorders equipped with studio microphones down to low-grade cassette recorders equipped with the poorest of microphones. Then the equipment may be fine in terms of maintenance, or it may be on the point of breaking down after the field-worker has dropped it a couple of times when carrying his recorder across rocky paths or

slippery ice, or after weeks in incredible humidity and ex-
treme ambient temperatures. It may seem easy to warn the
field-worker that he should always use decent equipment, since
the technical expenses will probably be a modest entry in the
total budget anyway. But it is not always that simple. The
present author has been doing field-work with high-quality
equipment in some cases but has been forced on other occasions
to borrow or hire dubious equipment, sometimes with distinctly
unsatisfactory results. And even the best and most well
checked equipment may at times go on strike; there may be
trivial problems such as running out of good quality tapes
and having to buy the poor quality tapes available, running
low on batteries way out in the jungle, or finding that con-
trary to expectations there is no electricity generator run-
ning to supply the bulky mains operated tape recorder which
one has strived hard to bring along.

Then there is the acoustic environment! Maybe recordings take
place inside a small room with disturbing reverberations or
tinkling noise from the kitchen or the workshop. Maybe it
takes place in open air under potentially ideal circumstances
but with occasional or even constant disturbance from domestic
animals, from cicadas or sea-gulls, or from the soft but in-
credibly penetrating hiss or drumming sound that accompanies
field-work done in the rainy season. Such constant sound is
apt to be ignored during the field-work session, but it has
a terrible effect when mixing with speech on the tape. -
Finally, in all likelihood there will be a lot of disturbance
from curious spectators, or worse: a hopeless mixture of eager
voices blending beyond recognition on the tape. This, of
course, does not happen all the time (if it did, there would
indeed be no point in recording), but it tends to occur at
crucial points in the recordings, and it is only when listen-
ing to the tape afterwards that one realizes how bad the dis-
turbance was.

Often the field-worker has to make an unpleasant compromise
between getting two kinds of noise on the tape: he may be
forced to place the microphone quite close to the informant's
mouth in order to reduce the level of background noise pro-
portionally, but then again it may cause severe distortion
and spurious noise if the microphone is too close. Most
microphones used for phonetic recording are not of the type
used by pop-singers, who seem to almost swallow the microphone
during their singing; on the contrary, the typical recording
microphones react spuriously to such treatment. Occasionally
a forcefully aspirated stop consonant may sound like a hurri-
cane because of the airstream hitting the microphone grid,
unless the field-worker has been ingenious enough to place a
sock or the like around the microphone.

Finally, we have the informant himself. Often, what is lin-
guistically most appealing is to work with an elderly in-
formant who still remembers a good deal of the once so rich
vocabulary of the language under study, and whose morpho-
syntax is less corrupt than that of his younger tribesmen

(who perhaps have gone to school and learned about the higher prestige of other languages). The elderly informant may, however, have a very bad voice, and he may have very few - if any - teeth left (which would be just wonderful if it were a matter of doing X-ray of tongue positions but is most discouraging in the case of tape recording). In addition he may perform less satisfactory in the sense that he does not speak up clearly and produces too many hesitation sounds.

Unfortunately it is often so that the more relaxed and confident the informant is, the worse are the acoustic conditions for recording. The informant may be absorbed in smoking his pipe or eating candy sugar with his coffee, making terrible noises in between or, worse, on top of the words he is uttering, and the field-worker may hesitate to interfere in an otherwise perfect and genuine linguistic performance in order to deprive his informant of these symbols of ease of mind and self-assurance. Furthermore, the good informant may take such interest in the topic of his talking that he moves his head violently, while the field-worker is trying desperately to keep the microphone somewhere in the vicinity of his mouth.

Problems associated with speaker performance are so numerous that they cannot be listed here. In working with tribal informants who have had little or no contact with Westerners one may have a very hard time persuading the informants to speak up loud, and if they finally do, the result may be an unnatural and exaggerated performance. It goes without saying that rhythm (including absolute durations of vowels and consonants) and intonation, in particular, are vulnerable to such exaggerated speech.

On the other hand, field-work does not just consist in recording what informants choose to say in casual conversation. The existence of various levels of distinctness is a genuine feature of language, and so is the scale of possibilities of marking differences in syntactical structure or in the morphophonemic status of wordforms by various phonetic signals (boundary signals, presence or absence of coarticulation phenomena, etc.). The linguist never arrives at a deeper understanding of the functioning of the language without exploring this scale of possibilities. It is necessary to have words and phrases said at "normal" speed (whatever that means), but it is also necessary to have access to maximally distinct renderings of the wordforms to be sure what is going on. There is nothing wrong in asking the informant to repeat a wordform or phrase over and over again, perhaps slowly and loudly, if only one is sure to get also the more casual rendering occurring in normal conversation. One must pay attention to the possibly differential use of distinctness levels within one discourse unit, the speaker slowing down on focal points and slurring other parts of the utterance in order to ensure optimum communication. To the researcher who is striving with his pencil and eraser to get the transcription right this variability may be rather a nuisance, but it is indeed an extremely important characteristic of languages.

The problem is that the transcription of certain sounds or syllables may remain controversial (perhaps causing vehement disagreement among the field-workers, if there is more than one) even after numerous repetitions, and perhaps after the informant has been shouting right into one's ear. The informant may wonder about the field-worker's mental abilities, and the field-worker himself may also begin to wonder (if he has not wondered all along) about his own poor performance in transcribing (How do other people always arrive at consistent transcriptions so easily, if I have such difficulties?). Under such circumstances it is, of course, an enormous help to have high quality recordings which can be studied afterwards.

A digression on the processing of recordings may be in order here (although it takes up issues which have in part been dealt with already). Even with the best of equipment one should not ever permit oneself to be less attentive during the field-work session on the assumption that it is better and easier to listen carefully at home. Minute quality differences in consonants, in particular, are often heard more distinctly in the presence of the speaker than on the tape, and this may be true especially of consonant clusters. On the other hand, there are several kinds of phenomena which are more easily and safely assessed when listening repeatedly to a tape, and here the supplementary use of instrumental analysis immediately comes in very useful. One such feature is tonal manifestation; another feature is voicing. Pitch is perceived, of course, but by using pitch meter recordings one can get extremely detailed and accurate displays of even microprosodic phenomena; the difficulty is that it takes some phonetic expertise to interpret such raw curves in terms of what the listener actually may perceive. The analyst must know, for example, to what extent perception involves an integration of tonal movements over a certain span of time (physically changing Fo being perceived as steady pitch); to what extent the "tail" of decaying fundamental frequency vibrations tapering off at the end of an utterance (possibly an isolated wordform) should be included in the specification of pitch, and so on. The instrumental analysis may give extremely interesting information of tonal phenomena, and the like, but obviously the information is of a different kind than the impressionistic appreciation of tone, and even though the two descriptions complement each other significantly they should not be mixed up. As for voicing it is very easy to set up a filtering system and to produce an oscillogram enhancing the fundamental frequency oscillations so as to serve as a voicing indicator (or a more sophisticated data processing approach may be used, based on an analog-to-digital conversion of the raw speech signal). In this fashion one can get detailed information as to the actual presence or absence of periodicity in various phases of stop consonants, for example. The problem again is that one gets too much information for the correlation with one's auditory impression (such as weak oscillations which are in fact inaudible) and even spurious information (such as periodicity due to reverberation in the room in which

the recording took place, or extraneous periodic noise occur-
ring intermittently), disturbances which are perhaps easily
"filtered out" by the ear but not equally easily detected in
the oscillogram. The analyst must be able to see this in the
oscillogram. Still, the present author has found that such
voicing registration is useful not only in its own right, i.e.
as a component of an acoustic analysis, but also sometimes as
a practical help for the purpose of checking one's auditory
impression. Needless to say, the transcription should not just
be changed to agree with physical measurements, that would
corrupt the whole idea of transcription on an impressionistic
basis, but glaring discrepancies may perhaps stimulate the
analyst to listen more carefully or to take in more or better
material. - In passing, the present author wishes to mention
that he has, on the whole, found the two approaches to be in
reasonably good agreement. That is, if there is serious doubt
(for the trained ear) about the transcription of a particular
segment in a particular token as voiced or voiceless the curves
typically show some relatively weak oscillations (often only
during a minor part of the total segment duration). Thus the
problem remains but perhaps its nature is better understood,
which may be comforting or even useful to the person struggling
with transcription. Above all, however, such sporadic informa-
tion on the acoustics of speech in one's target language may be
enormously suggestive of instrumental investigations which it
may be worth while to perform.

V. CHOICE OF DATA TO BE RECORDED

Maybe the most important issue is: out of the mass of talking
that occurs during a field-work session, what kinds of data
should one record? It is not very practical just to let the
tape recorder run all the time, since the subsequent job of
sorting out what is going on on the tape is quite frustrating.
On the other hand, if one does not ever press the switch until
one has prepared a list of items to be recorded, or until some-
thing exciting is going on, there is a great risk of missing
some of the most valuable instances of spontaneous linguistic
performance, which it may be difficult or impossible to re-
create afterwards. There is a bargain here. Often the most
manageable approach to the recording of narrative texts is to
work over the texts first and then make a recording, but the
naturalness of the original version may to some extent be lost
in the final version that is recorded. If the field-worker is
interested in rhythm, and the like, he must calculate the risk
that the version entering the tape is spoken in a pedantic,
dictation-like fashion - or perhaps with a trace of boredom
in the voice - which makes it less than ideal as a specimen of
narrative style, although it may be very useful from the point
of view of getting vowel and consonant qualities right in the
phonetic transcription, and also useful for demonstration of
how sentences are designed in this language. If the informant
is at all talkative the obvious solution is to try to get
both: monitored texts and totally spontaneous speech. As for
the latter, one may then have to stop the informant if he

starts to tell something interesting and to have him start over again while the tape recorder is running. This requires some tact, and it is successful only with some informants (and especially if the field-worker has cared to establish good enough social relations with his informant); others may lose all inspiration once stopped. And then there are potential informants whose linguistic performance is heavenly music to the field-worker, but who flatly deny to perform in a field-work session because they do not consider themselves bright enough to say something intelligent on tape, or consider their own speech too vulgar. In such a situation it is hard to face the fact that one may have to resign.

Now, to what extent are recordings of free narration and conversation useful to phonetic-phonemic analysis in particular? It may be very difficult to approach a systematic treatment of such data: its immediate value will be rather that there may be a random occurrence of crucially important sounds, sound combinations, sandhi phenomena, and the like, which perhaps escaped the analyst in the first systematic elicitation of information. And then, of course, natural connected speech is enormously suggestive in the context of rhythm and intonation studies. But altogether the immediate value of such data is that it is suggestive rather than being directly amenable to systematic treatment and generalized statements.

It is different with connected speech emerging from the interactive field-work situation as such. The linguist may prepare a text together with the informant and may see to it that the text is interesting not only in terms of its contents, lexical information, morphosyntax, etc., but also - and perhaps above all - in terms of the phonetic-phonemic phenomena it illustrates. In the early stages of field-work on a new language the first practical requirements are (1) to get a certain basic lexicon, and (2) to get a reasonably firm basis for consistent transcription, so for quite a while the phonetic-phonemic illustrativeness of the texts recorded must in fact be given first priority.

Often the analyst will find (or at least believe) that he is better off in his endeavours to get the patterns clear if he concentrates on short sentences and/or single-word utterances in which he has stripped off whatever can be dispensed with without totally losing the structural distinctions to be investigated. In the initial stages of the analysis it is indeed a delightful simplification, and at least for phonetics-phonemics it certainly holds true that one gets quite far with one-word utterances in the analysis of vowel and consonant systems, and with one-clause utterances in dealing with basic stress and tone patterns (whereas focal accent and most of the interesting aspects of sentence intonation require a larger domain of study, of course).

A too reductive approach may create difficulties, however.
Let us assume that we are dealing with a tone language. In
the initial stage of "discovery" of the tonal system it may
seem expedient to concentrate on short single words in order
to avoid complications stemming from tonal sandhi or uncertain-
ty about the actual number of consecutive tones occurring on
longer stretches of syllables. This is quite all-right, and
similarly it may seem useful to take such isolated words
forming minimal sets and record them for measurement and de-
scription of the acoustic correlates of tone in this language.
However, it is strongly advisable to take also such words in
a larger context in order to see what happens when the word is
not bearer of the whole sentence intonation contour (on top of
the toneme, as it were), and when it is not subject to final
lengthening, as it probably is in isolation (words in isola-
tion being a special case of utterance final position). One
solution, then, is to have a stereotype frame containing
material both before and after the test word and designed so
that the word has full stress (impressionalistically speaking)
and exhibits a minimum of tonal interference with the context.

For the study of vowels and consonants it is always crucial
to have the items in several different positions. Often, it
is most essential to look at word initial, word internal and
word final position (there may also be more specific positions
associated with consonant clusters, of course). Here again,
one should be somewhat cautious with isolated words. Especial-
ly if the data may come to serve as input to instrumental in-
vestigation it must be realized that initial and final position
posit severe problems of delimitation. If an isolated word
starts with a voiceless stop it is totally impossible to meas-
ure where it begins, and if the final segment is a vowel it may
be difficult to make a principled decision as to where the
vowel ends (in some languages the oscillations may die out
quite gradually). It is much better if the test word is placed
in a neutral, stereotype frame (occurring before or after or
on both sides of the word, depending on the items to be
examined). The difficulty is that the segment of the frame
which is immediately adjacent to the initial or final segment
of the test word should be chosen so that there is a minimum
of articulatory interaction (or possibly phonological alterna-
tion triggered by the frame), and also so that the boundary
between frame and word comes out clearly in acoustic curves.
This makes the choice of frame somewhat difficult since the
differences within a list of test words may be such that there
is no one frame which is equally suitable for all test words
(a frame ending in a stop consonant is, for example, a bad
choice if the test word begins with a stop consonant, whereas
it may be an excellent choice if the test word begins with a
continuant). Thus one may have to permit small variations in
the segmental composition of the frame.

The above may seem a small technicality, but it must be empha-
sized that much material which was specifically arranged for
the purpose of acoustic phonetic analysis turned out eventually
to be very difficult or in part impossible to work with because

the frame was not well chosen. It takes phonetic experience
to foresee these difficulties, and even the experienced
phonetician may make the silliest errors in the design of his
data, which he then bitterly regrets afterwards.

VI. FINAL REMARKS

Hopefully, the random reflections communicated in this paper
may serve two purposes: (1) To urge the field-work linguist
to be as careful as possible with his tape recordings, both
because of the inherent importance of phonetic documentation,
and because his tapes may perhaps - with all their inescapable
limitations - help phoneticians to get the scent of some inter-
esting phenomenon, whose acoustic properties can at least be
guessed about on the basis of acoustic analysis of selected
items. (2) To urge phoneticians to take a wider interest in
field-work and to put some of their practical and theoretical
expertise to use in this context. But above all: too few
young and healthy linguists and phoneticians (at least in these
quarters of the world) seem to be willing to realize - or at
least to take the consequences of realizing - that gathering
information on neglected languages is an obligation for our
generation, considering how rapidly languages are disappearing
of which no satisfactory record is available. It should be
realized also that field-work is an important entry to new
insights, that it is indefensible to pursue typological studies
if we do not do our best to widen the scope and create a safer
basis for typological statements and sweeping generalizations
about language universals. There is so much we (still) do not
know about languages, and studying Language without bothering
about the proliferance of virtually unknown languages (or
poorly understood phenomena in otherwise well-known languages)
surrounding us on all sides, cannot in the long run lead to
real progress.