

CHAPTER TWENTY:

PHANEROSCOPY:

THROUGH THE SONIC PHANERON

"If the doors of perception were cleansed every thing would appear to man as it is, Infinite. For man has closed himself up, till he sees all things thro' narrow chinks of his cavern." Aldous Huxley (1954)

"Mind is First, Matter is Second, Evolution is Third." [from CP 6.31-4]

This chapter introduces Peirce's phaneroscopy (phenomenology) by means of a discussion of linguistic fieldwork (see also Sakel and Everett (2012) and Everett (2004), though the conclusions are intended to apply to any research of any kind. Phaneroscopy is the logic of perceptions. I have built the discussion that follows around linguistics field research because those perceptions are deeply embedded in my personality and life history. Perceptions' effects in our lives are seen in many different ways that most people find important and worth exploring, when they are exposed to them. In the 1960s, perception was explored by many of my generation via hallucinogenic drugs. In fact, I might have used hallucinogens myself in my (very) wayward teen years. I think I might have. In any case, the effect of drugs, LSD in particular for those of the 1960s, is to affect our perceptions - colors becoming tastes, musical notes becoming animate characters. I would say, in Peircean terminology, that drugs play especially with firstnesses. In that sense they are similar to new research. As I entered the world of Amazonian peoples nearly fifty years ago, my then-experiences were so unlike my previous experiences as a linguist and a human being that they fell outside of my expectations (based on my previous experiences, a.

Linguistics field research is a crash course in Peircean phaneroscopic (phenomenological) categories. In one early formulation, Peirce summarized his categories this way: "[M]y three categories, ... in their psychological aspect, appear as Feeling, Reaction, Thought ...The true nature of pragmatism cannot be understood without them." (CP 8.256). Peirce simplified the labels for his three categories at the same time that he was improving the logic behind them, eventually settling on the three categories as *firstness*, *secondness*, and *thirdness*.

Simply put, firstness links with Peirce's term *tone* and is associated with qualities of experience. When you first arrive in a new linguistic situation, hearing a language that you have never heard or cannot speak a word of, you will hear a lot of unrecognized sounds. No single sound comes before your consciousness, merely a cacaphony of strangeness and newness. Your hearing might be intermingled with your sense of the humidity or the heat or the cold or your own hunger or the sight of people from a culture very different from your own. All of this "bloomin, buzzin, confusion" bombards your senses. This is the firstness of field research - a liminal experience just below conscious focus of certainly qualities of sound, touch, smell, and so on. This is the category of abductive inference - guessing about what might solve your shock. Abduction is firstness, an iconic representation of your inference in a way that induction and deduction are not. Therefore, the first day of fieldwork is also the firstness day. But it is not the only one of the latter. Many times during the first days and weeks of field research, especially monolingual (no language in common) field research, there will be many qualities that you perceive below the level of intentional focus or consciousness.

If you are a trained linguist or an experienced field worker, however, you *will* soon turn to give your intentional, conscious focus to certain facets of your experience, a particular sound that you transcribe phonetically or, perhaps, a distinctive facial expression that marks the end of

a speech segment. These are *tokens*, not tones; secondnesses. There is a resistance in them or a relationship to them with either, say, the International Phonetic Alphabet or your own memories of facial expressions that provides an experience of secondness. You are now conscious of what you are considering, comparing and relating sounds. The inference associated with secondness is induction - relating one thing with another to get to another.

Finally, you might have an "a ha" moment and decide that several sounds you are hearing are aspirated and not limited to syllable-initial position as they would be in English. This means you are far along in analysis. Your generalization represents the thirdness of your current analysis. Deduction is the type of reasoning associated with thirdness. You have gone beyond tones and tokens and now are at the level of *types* (remembering that tones, tokens, and types are Peirce's terms, though most philosophers only use his terms token and type). One way of putting these categories and their relationship to field research is to say that they cover observation, discrimination, and generalization - the activities of all science, not merely field research.¹

At the same time that Peirce is, through such work, becoming the founder of a set of basic categories of perception (one thinks that Aldous Huxley might have read Peirce with considerable resonance), he is building these into both metaphysical and epistemological theories. Telling us what categories *are* (metaphysical) and how these categories correspond to our thinking (epistemological).

Let's try to summarize these categories in the context of Peirce's philosophy:²

¹ Atkins (2018) points out that Peirce alluded to another, never worked out, series of phenomenological categories, but I will ignore this possibility here.

² See Atkins 2018 for detailed study of these categories.

Category	Character	Experience	Numerosity	Technical Definition	Extension
Firstness	Quality, feeling	Possibility	Vagueness (appropriate quantifier "some")	Reference to a ground (which is an abstraction of quality)	Monadic
Secondness	Resistance, reaction, association	Brute reaction	Discrete, "this one"	Recognizing correlate	Dyadic
Thirdness	Representation, generalization, mediation	Habits, rules, laws, necessity	Generality, "all of these"	Requiring Interpretant	Triadic

The importance of Peirce's phenomenology to his pragmatism "determines the distinctive character of his pragmatism." (Ika 2002, p11) And as Ika also states (ibid), "His metaphysically and epistemologically grounded 'pragmatism' requires that determining meaning involves the ability to predict the "would-be" situation of events." Ika's statement here links semantics with phenomenology - what is meaning, what is interpreting? These are the core questions of pragmatism.

Like Hegel, Peirce rejected all forms of cognitive foundationalism which Descartes, to the contrary, embraced (see Burch 2012, p61). Also like Hegel, Peirce saw reasoning growing forever, gradually eliminating some imperfections while introducing others. But Peirce parted

ways with Hegel when Hegel equated what for Peirce were thirds with "invariant laws." The German idealists always spoke in grander terms. Peirce simply spoke of thirds as habits (and all laws, from gravity to parking tickets are habits). Peirce departed from Kant's system of categories at the age of sixteen when he, Peirce, decided that Kant's logic was "puerile." What Peirce did agree with was this modification of an insight of Kant's (Atkins 2018, p 9): "The phenomenological categories somehow are based on, are derived from, are generated by, or otherwise correspond to the logical forms of propositions as discovered in formal logic, which is a part of mathematics." The doors of our perception are never more challenged experimentally in my experience than in linguistic and anthropological field research. So let me give some examples from the Pirahãs.

The Pirahãs presented a challenging field experience to me when I first visited their community in the Amazon in December of 1977. By of this visit they had already worked with outside linguists for eighteen years. The first team of missionary-linguists with SIL International (the mission I belonged to) entered their community in 1959. The Pirahãs had more experience with linguistic field research than I did at that time. Still, I had the job of analyzing their language "in its entirety."³

Arlo Heinrichs (1933-2018) was the first missionary to work among the Pirahãs. When he arrived in 1959, at the age of 26 (same age I was when I arrived there in 1977), the Pirahãs had no experience nor interest in helping outsiders to learn their language. None of them spoke Portuguese (then or now). So Arlo could not explain what he was doing; he could not ask for help; he could not ask them what something meant.

³ This is discussed in detail in my book *Don't Sleep, There Are Snakes: Life and Language in the Amazonian Jungle*.

Is this hard? Well, assume that you are Arlo. Neither cassette, hand-held portable video, or MP3 recorders has been invented. No portable computers. Only pen, paper, and your five senses. Even more significantly, the Pirahãs will refuse to talk to you if they don't know you and you cannot speak their language. They want nothing to do with you, except for one thing - sweet coffee. So Arlo began the daily practice of placing two pots full of very sweet coffee on the fire by a well-worn path and kept the coffee coming to the degree that his supplies would hold up, all day long. Families would come sit by the fire and share coffee. Hunters on the way to and from the hunt. Fishermen on the path to the river. Arlo sat by the fire with notepad and pen and would point to things to get nouns. He would show interest in their actions, hoping that they would describe what was going on. Sometimes they would. He would transcribe their verbal exchanges as fast as he was able. In this way, he slowly, day-by-day, built a beginning knowledge of the language.

This phase of field research doesn't begin with tokens and end with types - although later phases can be accurately described this way. Rather, in the early days of field research, even with substantial linguistic training and ability, we are not sure what we are hearing, or seeing, or writing down. We are looking out from our ignorance-clouded doors of perception. There are many details of each individual sound to sort out - relative frequency, formant structure, phonetic effects of adjacent segments, and so on. We hear none of this. We cannot identify many sounds. We hear "tones" (in Peirce's sense), impressions of firstness.

And one can indeed hear a great many new sounds. Take for example the Pirahã word for "milk" [ʔiBoli].¹ This word has a tone on each vowel. The acute accent indicates that the vowel carries a high tone. No diacritic on the vowel indicates that it carries a low tone. The first sound in this word is the glottal stop, ʔ. This sound is actually a break in the sounds. It is produced by

closing the space between the vocal cords. It is found in English sequences such as "uh oh" where the "uh" the "oh" are both preceded by glottal stop. The next sound is the i-sound found in the English word "bit." This is followed by a voiced bilabial trill (with vibrating vocal cords it is pronounced like a normal b-sound, but with the lips vibrating as it is produced, a rare sound in the world's languages, but one that the average linguist would have encountered in their articulatory phonetics class.⁴ The next sound is a simple "o" sound, as in [bot] "boat" produced with the back of the tongue rising in the back of the mouth, the vocal cords vibrating, the lips rounded, and air coming from the lungs through the mouth, but not through the nose. Then we come to the incredibly strange symbol, l. This is produced beginning with the tongue in the place and position to form an 'l' sound, but moving quickly after the tip hits the roof of the mouth to form an 'l' out between the lips with the lower portion of the tongue hitting the bottom lip. It is found in no other language of the world. And it is not covered in any elementary phonetics class.

This is a hard word for a non-Pirahã speaker to learn. And since no one would be trained on sounds like it, they would be unable at first hearing to recognize it as any specific sound. It would be an impression, a Peircean tone, i.e. a first. Only by listening and mentally opposing it to sounds one does know (such as "l", or a Spanish-typical "flap r," or a "d", etc.) could one eventually make this sound a second - with knowledge of how the sound is formed in relation to other sounds. Finally, as one studies the entire phonological system of the Pirahã language, one would come to the conclusion that this weird sound is a token of the type or phoneme (or "underlying segment") /g/. There is a lot of analysis there and, pointedly for a Peircean theory of field research, the analysis of necessity takes us from the category of a first (a tone) to the category of a third (a type or phoneme).

⁴ A video description is found here: https://www.youtube.com/watch?v=0uGL-k_DyDY

This is a striking example, but still just one example, of the routine work of science, in this case the science of linguistics. All three of Peirce's phaneroscopic categories are essential to explaining how linguists do their work, whether in field research or in any other area of the field. We go from impressions to more distinct entities to generalizations.

To me a linguist is someone who can walk into any linguistic community, with only pen and paper, and emerge 6-12 months later with a relatively competent grammar of the language.⁵

Use whatever method you can. Alternatively, there is Quine's description of field linguistics:

"The recovery of a man's current language from his currently observed responses is the ask of the linguist who, unaided by an interpreter, is out to penetrate and translate a language hitherto unknown." Quine (1960, p28) One way to exemplify these statements is through a "monolingual demonstration," first pioneered by Kenneth Pike.⁶

And I interpret W.V.O. Quine's statement below as a typical experience of any field linguist: "A rabbit scurries by, the native says 'Gavagai', and the linguist notes down the sentence 'Rabbit' (or 'Lo, a rabbit') as tentative translation, subject to testing in further cases. The linguist will at first refrain from putting words into his informant's mouth, if only for lack of words to put. When he can, though, the linguist has to supply native sentences for his informant's approval, despite the risk of slanting the data by suggestion. .. How... is the linguist to perceive

⁵ John Goldsmith (p.c.) asks me to explain why I believe that people who spend their career studying one language should be able to jump right into any other language. The simple answer is practice in discriminating in the phaneron as well as practice in analyzing it. Languages are, in the words of Kenneth Pike (p.c.) "very, very different, but they are not *utterly* different" or we could never study them. Where does this similar come from? An innate UG? I think that this is undersupported by evidence, however popular the hypothesis is for some linguists. I believe that the limitations of the human vocal apparatus and the fact of co-evolution of that apparatus with our perceptual, especially hearing, abilities can account for this.

⁶ Here is an example of a monolingual demonstration, the present author performing:
<https://www.youtube.com/watch?v=sYpWp7g7XWU>

that the native would have been willing to assent to S_1 in all the situations where he happened to volunteer S_2 ?... " (Quine 1960, p29)

This is a hard question. How do we know what the native speaker knows? How would Peirce describe this activity phenomenologically? When a linguist arrives in a new field situation, hearing a language they do not speak or know much about, how do they begin aside from monolingually or bilingually? Well, they must be aware that although language is a semiotic system, and semiotic principles are logical and independent of any culture, the actual semiotics of a particular time and place emerge from a culture and society and thus cannot be studied independently of that culture and society. Peirce argued that signs are in a sense determined by their objects, along with their interpretants, the signs that are used to interpret (translate) them. Yet not everyone will understand the sign in the same way in a given community. To reach agreement on identity of meaning (i.e. identity of signs' interpretants) for Peirce requires interaction and inference until agreement is achieved. This is very much like Peirce's view of scientific progress towards the Truth.

The linguist is initially faced with the "barrage of stimulation" described: "The voluminous and intricately structured talk that comes out bears little evident correspondence to the past and present barrage of non-verbal stimulation; yet it is to such stimulation that we must look for whatever empirical content there may be." Quine (1960, p26) The research into all of this cognitive chaos has to start somewhere, though. So it standardly begins with sounds (as described roughly above) from the perspective of a non-native speaker, say, a physicist or linguist. The linguist will work out the phonetics of the sounds then move to the phonology then back to the phonetics, continuing this cycle until he or she or they believes they have reached some level of reliability or truth. Yet the phonetics is partially preceded by vague and unclear

perceptions of the language before the linguist begins to transcribe or analyze.⁷ For example, English speakers all hear one sound, /p/ in the words [park], [spark], and [carp], when in fact there are at least three sounds, all written as 'p' in these words, namely, [p], [p^h], and [p̄], respectively.⁸ Native speakers thus know less *explicitly* about the sounds of their language than they tacitly know about them, since speakers in general never perceive the separate etic (secondness) sounds but only the single emic sound that an etic sound is associated with. Yet they never confuse etic sounds in use. In just the same way, native speakers know how to use all the etic sounds of their language appropriately, e.g. the three separate manifestations (technically, *allophones*) of /p/ in this example: "Use [p] in syllable-medial positions, [p^h] in (some) syllable-initial positions, and [p̄] in phrase-final position."⁹

The distribution of sounds, just alluded to via the different manifestations of [p] in English raises its own phaneroscopic issues, in particular as regards *sequences of sounds*. At finer levels of granularity, the objects of sound systems can shift in natural-occurring sequences. So from the perspective of phonetics, the *phonology* (how speakers perceive their sounds) is the object. One could make the case that sounds of human languages represent icons and indexes. The different phonetic realizations of phonemes, e.g. aspiration of a syllable-initial consonants in English, serve as indexes of a particular language. Spanish, for example, lacks aspiration so when a native English speaker aspirates a consonant, e.g. the initial /t/ in [t^hodo], this is

⁷ These are both idealizations. Our understanding of "phonetics" seen, for example, in something so erstwhile objective or etic as the International Phonetic Alphabet, is shaped by our emic perspectives and most etic categories are already idealized in cultural ways. So there is no truly objective vantage point, just ones less contaminated in ways we know of.

⁸ The standard convention in linguistics is that //s are used to enclose phonemic sounds and []s to enclose phonetic sounds.

⁹ In Generative Phonology, phonemics is not a theoretically recognized level of analysis. Nothing hangs on this debate here, however. So where I have written "phonemics" one can read "phonology" without any change in intended meaning.

recognized immediately by any Spanish speaker (however vaguely, or in firstness) as "non-native." Audrey Hepburn's speech used to puzzle me until I became a linguist and realized that in many of her films she does not or barely does aspirate consonants in the appropriate positions. This is because her first language was Dutch, which lacks aspiration in such consonants. It indicated that she was not like me in some vague way. But the arrangement of phonemes linearly also is iconic and indexical. For example, in Portuguese final nasal /m/ is not pronounced, but is instead a mark of nasalization on the preceding vowel, as in "Belém" [belẽ]. The syllable shape is iconic of Portuguese and indexical of how phonemes can be arranged.

The study of sound sequences in natural languages is known as *phonotactics*. So we have sequences like [br] 'bright' or [bl] 'blight' in English, but not sequences such as [lb] or [rb]. Therefore English has no words like *lbight* or *rbight*.

Sometimes even after years of hard work, it is hard to pin down what belongs to the phonetics and what is in the phonology. That is, what is a second vs. what is a third (phonetics is, relative to phonology as a natural field research projection - though not relative to the science of phonetics proper - the study of seconds while phonology is the study of thirds).¹⁰ In my research on Pirahã, for example, although I classify [k] as a distinct phoneme of the language, I am unsatisfied with that view. It could be (as discussed in Everett (1979)) that [k] is simply the *portmanteau* of the sequence [h] plus either of the two high vowels of the language, [i] and [u]. Thus the word for "none" can be pronounced [hiaba] or [kaba] and the word "nevertheless" can be pronounced "hoaga" or [koga].

During phonetic analysis, the analyses of other components of language should be well under way. This is because the categories of one language component can affect the way the

¹⁰ In other words, phonology is the study, from its perspective, of the generalizations the linguist and the native speaker make relative to phonetic segments and sequences.

categories of other components are analyzed. The analysis of sound semiotics at the level of thirdness (phonology) is not primarily about the importance of use of articulatory or acoustic phonetics to check transcriptions. It is about coming up with theories of the categories of other languages.

Field research requires a talent for perception. What could such a talent be? It is phenomenological insight, based on apperceptual experience. Peirce preferred the term "phaneroscopic insight," perhaps to "phanerological" or "phenomenological" because he wanted to emphasize perception. This captures the field research requirement or talent for such insight. To see this better, perhaps, imagine that you are sitting alone on a log, on your first day in the jungle. Look around. What do you see? Listen with your eyes closed. What do you hear? Birds? People talking? Animals in the forest? How does your skin feel? What do you smell? Open your eyes and look at the faces you approach in the novel village you are in. What expressions do the faces take? How does age show in the people's hair and face? Are people naked or dressed? Is their skin smooth? What do you sense about the people's attitudes towards you?

The abductions and inductions such exercises lead you to may produce vagueness, ambiguity, or uncertainty. If the feeling is certainty about any of these questions, you are making a bad start. An unperceptive start. A non-pragmaticist start. You have begun in a state of firstness. But you must move on from there perceptually and interpretationally. The sounds you hear, the sights you see, the smells you smell, are all vague firstnesses.

You have inserted yourself into a new environment. You must learn it all simultaneously. Semiotic systems are intertwined with phenomenology, with actions, words, body postures, housing arrangements, questions to you that you are far from understanding. But you are there, let us say, as a linguist. You are not a tourist - which means that you cannot be lackadaisical in

answering these kinds of questions for yourself. The questions you came with and the questions that suggest themselves to you as you live in this new place, and the questions that are put to you by these new people, must all be answered.

Someone now sits down beside you on the log. You both smile. Lesson one: their smile corresponds experientially to your smile. It is a secondness moment. You compare smiles. You reach for a thirdness - an understanding of this exchange of smiles. An understanding of cross-cultural acceptance. Exploiting your good fortune and this new person's good will, you next point at the ground and utter "ground." The speaker at your side smiles again and says [mìgí] (low tone on first vowel, high tone on second). You write it down. Next, you point at the sky at say "sky." The speaker comes back to you by repeating the word [mìgí].

At the level of secondness, all is fine. You gave a stimulus and received the response portion of that antiphonal exchange. But in the "ground" - [mìgí] pair your attempt at thirdness was that [mìgí] is just the Pirahã word for "ground." But if you were correct, how can [mìgí] simultaneously serve as the sign for "sky?" What have you missed? What is not clear?

Back to the drawing board. Signs (objects, interpretants, and representamens) need not match across cultures, not any more than sounds do (though at a macro-level, sounds and signs are never "utterly different" across cultures. Understanding others requires some inferential bridge, that evolution appears to have provided. Different languages have different sets of sounds (usually, but not always, drawn from a simple universal set of sounds, based on human physiology)).

The sign [mìgí] in Pirahã, like the sound "ground" in English, emerges from a culture with its own classification of signs according to its own phenomenology. It turns out that [mìgí] means "natural vertical boundary of the world." There is a bottom boundary and a top boundary

and they are both called [mìgí]. The Pirahã view the world differently. There is no heaven. There are only barriers. And between those barriers, it turns out, we live in the ʔooí "jungle" or, more generally, "place of life."

From this example you might reasonably surmise that a semiotic thirdness is going to be hard to achieve. This is *always* the case. Linguists tend to apply a digital analogy to meaning, along with the assumption that signs and their interpretants come from a universal inventory, as speech sounds tend to. But technically speaking, this is incorrect in both cases. Although sounds are constrained by human hearing and sound-production ability, inventories of symbols (sounds are indexical and iconic legisigns most of the time, though they can also be symbols, as we will see). Inventories of sounds can be iconic, indexical, or symbolic. To see this, let's take an iconic perspective of the set of sounds you have transcribed so far. Pirahã can serve as an example.

When you first hear sounds and do not understand quite what you are hearing, this is, again firstness. This is the great mystery of the initial phase field research. Everything is new. Nothing is clear. Nothing is quite distinct. Nothing is quite a secondness. But as your training and ears focus your perception.

It is standard procedure in linguistic analysis to chart the sounds you are encountering (preanalytically we refer to these sounds as "phonetic segments" or "phones"). Each sound is plotted on a phonetics chart by place and mode of articulation. If you were working on Pirahã, your initial chart might look something like the following:

Consonantal phones

p	t	k	ʔ
b		g	
m	n		
ḃ	ḥ		
	s		h

Vowel phones

i		u
ɪ		o
	a	

What are these charts? They are icons of the mouth and the sounds distributed from the lips [p] to the pharynx [ʔ] and [h]. The icon of the chart as a whole is important for both corollarial and theorematic reasoning. The icon itself is a first, representing in some vague way the mouth and phonetic processes. But it allows us to display secondnesses (oppositions between sounds) and derive thirdness (generalizations, scientific conclusions). For example, secondness can be seen in the opposition between voiceless [p] and voiced [b] or bilabial [p] and alveolar [t]. Or [i] vs. [u] and so on.

How does this help with thirdness? To see this, consider the segments of the related language Mura, like Pirahã a member of the Mura family of languages (though only Pirahã is

still spoken, Mura word lists were taken by von Martius in about 1821 (von Martius (2009)) and then one hundred years later by Nimuendajú in 1921 (Nimuendajú (1948)).

Mura Consonants (from Nimuendajú)

p	t	k	(?)
b	d		
m	n		
	s		h

There are interesting things happening here. First, Mura has [d] and Pirahã does not. Instead, Pirahã has [g] and Mura does not. Further, the glottal is in ()s because Nimuendajú doesn't list it. However, he never seemed to hear glottal stops in his travels and word lists, perhaps (Aryon Rodrigues, personal communication) because in German (like English) the few glottal stops that occur are not phonemic (not thirds). He either could not hear them or ignored them. Also, the [k] sound, as discussed in Everett (1979) is dubious. It seems to be not a phoneme but a portmanteau realization of [h] + [i] or [h] + [u]. Thus [kaba] 'no' can also be pronounced [hiaba] and [huaga] 'nevertheless' can also be pronounced [kwaga].

But what is most interesting is that Pirahã has a velar stop [g], where Mura has an alveolar stop [d], even though in both languages the allophones of the non-bilabial voiced consonant are alveolar. How did Pirahã develop a [g] but keep the alveolar allophones of proto-Mura (discussed in Everett (1979)), [n] and [ŋ]. To answer this, it is necessary to employ theorematic and corollarial reasoning in relation to the phone charts.

Notice the large gap under [k] in Mura - no corresponding voiced velar, [g]. Reasoning corollarily from the the Pirahã and Mura charts, we are able to compare the different inventories and notice this gap, one that might not have otherwise stood out to us. In Mura there is a gap for a voiced velar. Below [k] there are no velars in fact. But in Pirahã the appearance of [g] - *with the retention of the alveolar phones* - fills in spaces in the chart relative to Mura. Pirahã now has velar and alveolar voiced phones. It has more fully occupied its consonantal space. And, as I discuss in Everett (1979) since the Mura phones are closer to proto-Mura, i.e. closer to the original inventory, there has been a shift towards a fuller consonantal chart in Pirahã. Seeing this and being able to better understand this shift is theorematic reasoning from the icon. Semiotic understanding of a phonological shift.

Diachronically, the shift was: *d --> g in Pirahã and *d --> d in Mura (i.e. no change).¹¹ Not only does the icon show us this, but it offers a possible motivation, thanks to both corollarial and theorematic reasoning from the chart (we return to this case below).

What kind of data does the scientist need to produce such charts? When are they done collecting data (if ever). Most field linguists recognize, via corollarial reasoning, that once new words stop producing new phones for the chart that, in terms of segmental phonetics, collecting more words is going to reveal little (but one keeps collecting new words, phrases, etc. for semantic, morphosyntactic, and many other reasons. Phonetics is just the beginning.)¹²

For example, what are the guiding principles in devising a word list for phonetics field work? The basic idea is quite simple: the linguist wants to construct examples for testing in

¹¹ For non-linguists, an "allophone" is an observed pronunciation of a phoneme. A phoneme is, roughly, what native speakers think that they are hearing and producing when, at least physically, they are producing all of the allophones according to rules of distribution that it is the task of the linguist to discover. In Pirahã, for example, /g/ is realized as [n] at the beginning of a phrase, as [ŋ] between [o] and [i], and [g] elsewhere.

¹² But get the phonetics wrong and the rest of the analysis will be off. See Sakel and Everett (2012) for more discussion.

which not only the dependent and independent variables are properly controlled, but also in order to achieve a valid thirdness or understanding of the language. That is, the linguist wants ensure that they are studying what they think they are studying. Consider how one might go about studying the difference between a voiced stop and a voiceless stop. First, assemble words with the sounds in minimal or near-minimal pairs. For example, suppose that you want to study the contrast between /g/ and /k/. Word lists will give you a reasonable start (where I assume that all words below differ in meaning).

gabi, bagi, gut, tug, grat

karg, garg, gark, kark, kãg, gãk, etc.

kabi, baki, kut, tuk, etc.

That is, each segment to be tested should be recorded preceding and following all vowels and all consonants and in word-medial, initial, and final positions. Once this is done, if the recordings are of adequate quality and quantity, then you have the basis for comparing spectrograms of the two segments. Likely, the most interesting distinctive phonetic process you will find in this case is Voice Onset Timing.¹³ However, perhaps you have reason to believe that the articulation of the sounds is also different in some way. You may want to make palatograms of each of them.¹⁴ You may want to film speakers or use ultrasound, etc., depending on where

¹³ Voice onset timing (VOT) is usually described as the length of time that passes between the release of a stop consonant and the onset of voicing or vibration of the vocal cords.

¹⁴ Ladefoged (1995) gives an excellent set of suggestions for field palatography. He suggests painting tongues or palates with either purified charcoal or the scrapings from burnt toast mixed with olive oil. These can be painted on the subject's palate (for linguography 'writing on the tongue') or tongue (for palatography 'writing on the palate') with a never before used or sterilized paintbrush, approximately 0.5 – 1.0 inches in width.

In my fieldmethods class at the University of Manchester, a couple of undergraduate students became enthusiastic about palatography and their fieldwork papers showed excellent palatograms. One of the students decided, however, that olive oil + burnt toast scrapings tasted 'yucky' so she used softened chocolate and butter. She got reasonable palatograms doing this. However, the disadvantage to tasty 'paint' is that it produces more salivation, smearing the palatogram and thus generally producing less useful results. So bad-tasting palatographic 'paint' may be better for science.

you are at and what kind of research budget you have. I turn now to consider technical aspects of phonetic and phonological studies.

Phonetics, because its domain is the vibrations emitted from a vocal apparatus, received by some signal-detection device (e.g. an ear) and assigned an interpretant by a mind, is at once a shared human capacity (our ears evolved to hear what our mouths utter) but for the phonetician also an acquired skill.

The phenomenological point of all of this is that the methods of field research are designed (largely unknowingly) to enable the linguist to move beyond the firstness of log-sitting and the secondness of phone recognition, to the thirdness of phonological analysis. Once again, Kenneth Pike recognized this to a limited degree with his intuitive and very pragmaticistic concepts of etic and emic. We train our ears and minds in the new environment to facilitate this phenomenological transformation.

It is interesting that Peirce in effect predicts the order of field research in his phenomenological categories. However, once again, in order to fully utilize his insights, linguists need to be aware not merely of his terms *type* and *token* but also of the preanalytic category, *tones*, that are a crucial part of Peirce's model, all of which correspond to Peirce's basic phenomenological categories of firstness (tones), secondness (tokens), and thirdness (types). Tones are "pre-etic" if translated to Pike's terms - they are elements sensed without being clearly, consciously perceived. Tones are the sights, sounds, smells, and feelings we have sitting on the log on our first day.

My definition of a linguist is not widely shared and when I say it in public it occasionally irritates some. Surely a theoretical syntactician who rarely leaves their air-conditioned office is also a linguist? The statement above doesn't say all linguists *do* that (it is generic, not universal).

But I do assume that most should be able to in principle. A syntactician who cannot do field research that is thus not a linguist by my generic definition (of course, people can research what they want and call themselves what they want. These are just my views). Peirce's phenomenology captures the necessary conditions and initial phases of linguistic field research presciently. Sakel and Everett (2011) offer a number of suggestions and guidelines for the conduct of linguistic field research.

Quine takes an unusual view with regard to meaning in field research. Like Peirce, he believes that in actual conversation no two people may mean precisely the same thing. Of course, this can be partially mitigated by inference, indexes, and further interaction. However, Quine, unlike Peirce, does not believe that there is any entity, meaning, for the linguist to concern themselves about. For Quine what we call meaning is the behavior of interlocutors, fluently engaged, expected and acceptable behaviors following from what is spoken. Nothing is added by a term designated "meaning." For Peirce meaning is crucial - it is the sign used to interpret another sign and it is the triadic relationship within each sign. There is an important point of agreement between Peirce and Quine regarding how we use language and understand it, however - inference. What we call meaning emerges from being able to infer what another is after, more or less. Quine summarizes his view of language as follows:

"Language is a social art. In acquiring it we have to depend entirely on intersubjectively available cues as to what to say and when. Hence there is no justification for collating linguistics meanings, unless in terms of men's dispositions to respond overtly to socially observable stimulations. An effect of recognizing this limitation is that the enterprise of translation is found to be involved in a certain systematic indeterminacy..." (Quine 1960, ix)

"The indeterminacy of translation invests even the question what objects to construe a term as true of. Studies of the semantics of reference consequently turn out to make sense only when directed upon substantially our language, from within." (ibid)

As a former Bible-translator, I regularly faced - but did not understand - the indeterminacy of translation.¹⁵ If one cannot be sure that one had elicited the word for 'rabbit' according to Quine, how on earth could I be sure that I had understood "frustrated initiation?"¹⁶ An interpretant is required to achieve semiotic thirdness, however. So unless one can find an accurate interpretant, one is doomed to semantic secondness - an inventory of signs without theoretical comprehension.

If the Pirahãs could speak English or Portuguese or Spanish, the only other languages I speak well at all, then I could ask them "How do you say **gabagai** in English?" A single answer would give me one datum for figuring out the meaning of the suffix (I would more likely ask in various ways and not merely request a single word translation). But would that datum, a translation of the term, or data, many translations of the term, be enough? Not really. Translation presupposes that two signs in Peirce's sense match up more or less exactly or that the Pirahã suffix and the English translation both have exactly the same objects and equivalent interpretants in each language. And since interpretants are recursive (every interpretant must be interpreted by another interpretant), all interpretants would have to match. And they will not.

Additionally, if Quine is right, a lot of typology and theoretical work in linguistics can be taken with a grain of salt. On the one hand, much of this work is predicated on the constancy of

¹⁵ See Everett (2008) for the story of my journey from Christian missionary to atheist anthropologist-linguist-philosopher.

¹⁶ The first time I read Quine's Word and Object, I was a first-year graduate student of the Universidade Estadual de Campinas, in São Paulo, Brazil. As I read his chapter on indeterminacy of translation and field research, I was struck not by the main arguments initially but by the word, **gavagai** "rabbit," because of its similarity to a nearly ubiquitous verb suffix in the Pirahã language, **-gabagai** "frustrated initiation."

terms' meanings or interpretants across speakers. But the meaning of any term at any time is only approximately fixed by inference, not by fiat or social decree. Quine underscored this in his criticisms of the analytic vs. synthetic contrast in his "Two Dogmas of Empiricism," Quine (1951). All speakers negotiate the meanings of terms (the triadic nature of the sign, to be more precise). What this means is that I can never take a term a priori and expect it to have meaning anywhere other than its original context of usage and community of speakers.¹⁷

Switching to a Peircean characterization of the issues, any term has three components - its form, its object, and the interpretant (sentence, word, hand signal, etc) that interprets it. The form (representamen) is easy to agree on. But is the object? Can we always be certain that the object being referred to is identical to the object that someone else is referring to? The object is, after all, the locus of cultural variation, as we saw with the Pirahã word /bigí/ (phonemically written). Can we be sure next that the interpretant we are using for a term is the same as someone else is using? If the signs' inner constituents don't match the terms certainly do not. In effect Quine says they never will in any way we can be certain of. Peirce says that we do not know until we work together and then only when we have achieved a hard-won inferential consensus.

For example, much has been made in formal linguistics about passive constructions (e.g. *Bill was seen by John*) and their relationship to active constructions (*John saw Bill*). But to say that a construction is a "passive," crosslinguistically will always require inferring that it is OK to omit some features and include others in the "definition" differently in distinct languages, because the features proposed rarely, if ever, match up exactly. How can we determine that we are all referring to the same object? Only by objects as generals, i.e. abstractions, or by the use of indexes, e.g. pointing. Thirdness can only be achieved analytically. As a second, a construction

¹⁷ A theory-internal analogous problem is c-command, which would apply to certain structures *in certain analyses* within certain theoretical communities, though even then modified as needed.

labeled "passive" tells us only that this construction is different from some other construction, e.g. those labeled "active." What are the practical consequences of the term in each language in which it is applied and then what are the consequences for the theory in question? The only exception to such indeterminacy is in that inferential differentiation wherein the "definition" is algorithmic. But typological and theoretical definitions are never narrowly mathematical (though they do use logical symbols or statistics often enough). So what is their function? The only function of terms like "small vp", "passivization," "antipassive," c-command, and the like are as "signs of alert" is to tell us to be on the lookout for things that might have a family resemblance. But assuming the *identity* of such concepts across different languages is misguided in a profoundly adverse sense. Only by a careful, inferentially-based study of sign-to-sign interpretants can we make any such claim. Even then, if Quine is correct, our interpretants in one language are not fully determined by the interpretants of another language. Caution and humility are the watchwords in field research.

So think about the phenomenological or pragmatic task is undertaken in the practice of linguistic field research. All the history of research in general and field research in particular, is a history of fallible humans, evolved creatures, struggling to understand nearly infinite complexity in an alien environment.¹⁸ No one person is up to the demands of fieldwork. This is why advances in understanding are ultimately a social enterprise. The outputs of our fieldwork will necessarily be incomplete records of our progress in understanding parts of wholes that exceed our abilities. Thus, our research reports, whether grammars or articles or talks or webpages are never more nor less than our efforts to communicate with interested interlocutors about the beliefs we have come to form and hold, based on our experiences and how these beliefs affect

¹⁸ This section is paraphrased from Everett (2004).

our actions in science and in life. This is our canopy of epistemic humility. Further, I am more and more convinced that the beliefs we have come to hold about a particular language or grammar are constrained and shaped by the totality of our experiences, not merely our linguistic training. If this is correct, one immediate consequence for fieldwork that emerges is that compartmentalization of knowledge and its isolation from application, the notions of 'pure' ideas, 'deep thoughts', and 'objectivity' are recast from normal expectations to ways of talking about interpretants and objects in our praxis. This way of stating things, though, is closer to James than to Peirce. And this is not what we are after. So to reconcile this with Peirce's phenomenology, we need only recognize that there are many unfocused qualities sensed in our new field work environment that affect us, usually without us knowing, even when working within a social enterprise. These can throw us off. We need to think and bring to consciousness the "tones of the background," the vague sensations that will become the signs of our analyses.

The pragmatist view of fieldwork which I advocate here has a philosophical pedigree to claim for its integration of life, research, and application, tracing back to the three concepts of *usefulness*, *radical empiricism*, and *coherence* urged by William James (see James (1896), among many others), as well as the philosophy of Peirce. It is based both in Pragmatism and Pragmaticism. Getting the semiotics of phenomenology right is one of the principal calibrators of research success in pragmatism. As such let us consider each in turn: Usefulness is just the idea that a theory need not be known to be true or even falsifiable to be a good theory (no theory is true for Peirce until the hypothesized end of inquiry). Rather it must move us towards our goals, finding truth at the end of inquiry, and, in the meantime, have some utility in society. Coherence is the idea that each researcher accept and acknowledge the role of her temperament in her science and, more importantly, her status as an evolving creature with an ability to learn limited

by tools provided by random mutations, natural selection, and perhaps a few other side effects of evolution. I say more about this below. Radical empiricism will be taken up directly. First, though, let us return to our fieldworker and some preliminary advice for her.

The first question the fieldworker must ask herself, before she applies for a research grant, packs her bags, or buys a plane ticket to some exotic place, is this: what do I plan to study? In other words, what is the exact object of my investigation and what is the theoretical basis for interpreting this object? This will affect all the signs I employ to describe that object. Am I studying a set of semiotic principles that I can formulate about observed signs or am I studying the characterization of a speaker's knowledge of their signs? Am I studying the theory of semiotics or its local applications? Am I studying the semiotics of a language, or the cognitive capacity behind language? Are the data drawn from speakers' judgments or a corpus of texts? The behaviour of native speakers when exposed to certain questions? The answers to a questionnaire? The emergent communicative behaviour of a particular culture? All of the above? None of the above? Once they have decided what their object of study is, they might ask what it is that justifies their choice. Could one ever prove that any of the questions above is the right question to ask, for example? Further, once one has studied an object, is there any way to quantify what it is that one purports to have come to know? The short answer is no. But the object selected will constrain the understanding, signs, and interpretants achieved.

To consider a concrete example, recall from above that I defined fieldwork as the activity of a researcher systematically analyzing parts of a language other than one's native language (usually one the researcher did not speak prior to beginning fieldwork), within a community of speakers of that language, prototypically in their native land, living out their existence in the milieu and mental currency of their native culture.

Why propose this definition? From a pragmatic perspective, could I ever prove that it is the best definition? Is there any truth to it? All I can do in fact is to state it clearly. It cannot be proven. Well, I can say that I believe this definition to be maximally useful in grasping the coherence between a language and its culture, which I in turn find useful for understanding language itself. It is no more proveable than the judgment that blue is prettier than orange. Still, it is a point of departure for coherent fieldwork, more useful than many alternatives, perhaps less useful than others, all applications of usefulness teleologically determined. And it will determine what I identify as seconds and thirds.

But can't we do better than James, i.e. to merely claim usefulness for our proposals? After all, many researchers I have spoken to over the years will say the quantifier of their findings is "Truth", that they are after the truth about one of the questions above. Here is the principal dividing line between James and Dewey on the one hand and Peirce's quite different view on the other. Peirce's truth is an output of scientific reasoning by a community of independent scholars each responsible for their own findings, though eventually recognizing a growing consensus. Linguists should be interested in truth if for no other reason than that this is how Chomsky (2002, 129ff) describes the goal of linguistics: "So, the first question that has to be met is TRUTH [emphasis mine, DLE] for every state of the language faculty.' (133) or "Minimalist questions are substantive: they ask whether TRUE THEORIES [emphasis mine, DLE] of states of the faculty of language satisfy the interface condition in an optimal way." (132)

But what would 'truth' or a 'true theory' look like and when or where would we find it? It is the social output of the end of inquiry. No researcher alone could or ever has discovered truth apart from a society (even if that social connection is in books alone). Would we ever be able to recognize either? Do we asymptotically approach it by ever-closer approximations to it? Or,

paraphrasing Rorty, is truth just a compliment we pay to ourselves when we have made a well-justified statement? If my statement about 'x' at time 't' in context 'c' is true, then this implies that that statement is never in need of revision. But suppose I in fact do need to revise my statement as a result of a new fact coming to light. Was my previous statement true? Maybe, you say, in the part of it that did not need revision. But how can we ever know, in principle, what part will not need revision? Peirce answers simply "we may never know!" This does not justify abandonment of the effort to reach the end of inquiry. But it is, once again, humbling. The world and its languages are 'out there', of course. The denial of truth for the individual is need not a denial of reality or truth at the end of inquiry, though it does imply that we can never claim to have apprehended reality. It is difficult to see how saying that we are looking for truth is any better than saying that we will do our best to be convincing. The average individual field worker experiences a receding individual truth-line. Insisting on individual truth is just insisting that one drink the water from a mirage.

Peirce states that pursuing truth is like finding all of the places of π/π to the right of the decimal. It could take a long time, but we know how to get there. James and Rorty on the other hand threw up their hands in despair. Chomsky believes any individual can discover it now. There are two applications of the explicit acceptance that truth is socially discovered, towards the end of inquiry, likely non-existent in my lifetime. First, lack of guilt and arrogance. Second, the healthy refusal to be locked in to a given solution. All statements about a language are subject to revision in principle. But this just means that no statement about a language is likely to be currently true. Let's consider these in turn.

There are advantages to both the Peircean and Jamesian concepts of truth. Both of these ideas of truth enable us to work guilt-free. They do so by freeing us to follow our own interests

with no sense of servitude to intellectual fashion. I can accept, say, a definition that above of my research enterprise, or some other, or even none. No one can say a priori that their view of what is true is either more useful or closer to the end of inquiry. If truth could be known now, a la Chomsky, I might feel that I should not work on false ideas when other ideas had been shown to be true. But since things cannot be shown to be true immediately, by and large, no such burden can be placed on us. And yet at the same time, just as I no longer feel inferior for my specific choice of goals, such as fieldwork over theory or theory x over theory y, I have no basis for feeling superior either. My choice, *ceteris paribus*, is no truer than any other's choice for the moment. It must be judged by its contribution in the larger context of social inquiry. Pragmatism would simply urge us to do what is most useful from our perspective and, best matches our careful inference and that of other seekers in our society. James would claim that our quest for truth must entail what coheres most usefully with our personal life experiences and goals. But this is unPeircean, in which the individual is less important than for James in this context. Neither Peirce nor James would say that theory plays no role research, or that I should work alone, or that I should ignore other linguists and their results. To the contrary, theory is part of the social context of inquiry. All field researchers should reflect on the role of theory in the enterprise of fieldwork. And all should endeavour to learn from the past. As I have stated and as reflection should inform any experienced linguist, our field research is inescapably and rightly constrained and motivated by our life experiences, including reading, thinking, and other engagements with linguistic theory. The field researcher without knowledge of linguistic theory, without an on-going reading program in modern linguistic theory, whether eclectic (which I recommend) or focused on a single theory, is severely handicapped. But I suspect that most linguists know this. The real question is not whether the field researcher (should) know(s)

linguistic theory but to what degree linguistic theory should constrain her fieldwork. I would say 'up to coherence', in the sense given. A semiotic perspective - our names start as indexes and end up as symbols we (and those who encounter us) have made them to be. And this works for any language on earth or in the universe. From a semiotic point of view, the nature of any semiotic system anywhere in the universe at any time, must follow the same *logical* principles and thus field research on alien languages is just as doable as on human languages.¹⁹

Beyond phonology, a question that is relevant to the fieldworker with regard to Peirce's epistemology and philosophy of science is what role the fieldworker plays in the development of linguistic theory. Should fieldworkers and theoreticians be different people or, ideally, should each fieldworker be a theoretician as well? The answer is surely that this ultimately depends on the tastes and preferences of the individual fieldworker. At the same time, I believe that linguistics benefits when fieldworkers are doing more than merely gathering data for a theoretician to interpret. They have felt the vague tone of data and have taken it through secondness (e.g. phonetic tokens) and thirdness (e.g. phonemes) before other linguists ever see it. This history of the data is unique to the field worker.

In his book, *Working*, and in the documentary, *Turn Every Page*, author Robert Caro describes his method of writing long biographical-historical studies (e.g. *The Power Broker* and his five-volume biography of Lyndon Baines Johnson). The first thing is years of research and note-taking, followed by outlining and, last but not least, writing. In other words, Caro says that writing is a form of field research. Other authors, such as those of the New Journalism school of

¹⁹ This type of field work has been written into movies, as in *Arrival* (and see comments by or about me in relation to this movie, e.g. <https://www.youtube.com/watch?v=mtisHuJPo0o>; <https://thetyee.ca/Culture/2016/11/17/Arrival-Film/>; <https://sg.news.yahoo.com/alien-interpreters-linguists-talk-e-t-134305245.html>) and in the novel *The Sparrow* (Russell 1996).

thought (Joan Didion, Tom Wolfe, Gay Talese, inter alia) held a similar view. The best writing - even of fiction - is empirically serious and entails field research.

This would place fieldworkers in the same position as Gideon Mantell in relation to Richard Owen in the study of the fossil record. Owen considered Mantell at best a collector of data for him, Owen, to interpret (see Deborah Cadbury's (2000) fascinating account of their relationship). Yet science suffered greatly because of Owen's ascendance over Mantell and his failure to accept Mantell as a theoretician of the first order. As for Mantell and his fossils, so with the fieldlinguists and their data - there is really no one better placed to interpret field data from a phaneroscopic perspective than the fieldworker who collected the data, given the theses of 'radical empiricism,' coherence, and Peircean phenomenology, so long as the fieldworker is hard on herself and develops the requisite *stringency of thought*. To get at the import of this, we return to a third component of James's pragmatism, viz., radical empiricism, another of James's ideas that find resonance in Peirce's work.

According to radical empiricism (James (1987 [1909])), 'reality is just the flux of pure experience' or 'reality consists in nothing but experience'. It is our experience with an object that gives that object reality. James is here claiming that our experience with reality moves experientially (not always logically) from vague impressions to generalizations (just as Peircean phaneroscopy would predict). But since no two experiences will be exactly the same, no object can be the same to two people (or for one person at two times). This includes grammars and the other outputs of fieldwork. James' thesis seems particularly useful to answering the questions posed above about the object of fieldwork. But to fully appreciate it, we need to make the connection between radical empiricism and coherence.

If experience is all there is, as it is according to Pragmatism (and as radical empiricism), then there is no 'Truth', for the individual because they haven't had all the possibly relevant experiences. No one has. Moreover, the experiences which have the greatest coherence with the rest of our lives will be those which are most useful to us. But radical empiricism differs from Pragmatism because it favors the specific experience over the less directly experienced reasoning behind 'big picture' theorization. Although James was by no means averse to generalizations, yet he advocated the view that most useful 'big picture' was the generalization that best coheres with one's life experiences.²⁰ Peirce would have said instead, perhaps, that our task is to discover generalizations that best fit the findings of the relevant scientific enterprise. This will require some exemplification. Let me first exemplify what coherence means for me in fieldwork and then exemplify what I think it means for my object of study.

Coherence for me personally means many things. But primarily it is controlling the flow of firstness in potentially contradictory signals from the environment. To put it another way, coherence begins for many with avoiding "bad vibes," allowing your previous studies and life experience to guide you, however unconsciously, not losing sight of who you are. Each individual fieldworker should understand themselves. What *object* are they? What representamen are they (what do they look like and how is that interpreted, for example)? What is their preferred interpretant (how do they want to be understood by others)? The fieldworker cannot objectify themselves, i.e. prevent their own history and person from interacting causally with their observations and conclusions.²¹ It might be useful to try, but at the same time one realizes

²⁰ Admittedly this was in part due to James's abhorrence of math (his famous evaluation of a 1903 lecture of Peirce's at Harvard was that it was as "flashes of brilliant light relieved against Cimmerian darkness." James uttered this cutting remark primarily because Peirce's mathematics was too advanced for James to follow. And then James skipped the next couple of lectures in the series Peirce was giving (Peirce 1903, Turrissi 1997).

²¹ Interestingly this is a conclusion that underlies much of the thinking in the Diversity, Equity, and Inclusion movement - eminently Peircean in this narrow sense.

that efforts in this regard, should one expend them, will always fall short. (Kenneth Pike (1967) recognized something like this in his many references to the role of the 'observer' in the scientific process.) A crucial Pragmaticist-Pragmatist insight on fieldwork for me is this: *If your fieldwork is coherent for you, useful to others, and fitting in with the norms and practice of scientific inquiry, then you must be on the right track.* Ascribing Truth to any part of the enterprise prematurely reduces the claim of truth to little than religious incantation.

The other side of coherence, at least in my interpretation of it, concerns full experience with my object of study, perceiving categories of firstness, secondness, and thirdness all at once. The firstness keeps it new and should never be overlooked in one's studies. That is, that whatever I say or might say about one aspect of my object should cohere with other statements I have made about the object, and the sum of my experience with the object. For example, as I reside in an Amazonian community, my understanding and reports of the language or grammar or phonology, etc. of the language of that community ought to cohere with what I know about the speakers of that language and, where possible, tell me something about the cultural matrix in which the language is embedded. In Appendix One, I give an example from the communities I know best, those of the Pirahã people scattered up and down the Maici River.

Moving from firstness to thirdness breeds this coherence. But though James's ideas offer wonderfully useful insights into the conduct of scientific field research, our concern here is with Peirce's views. As Peirce put it, we are each of us a sign. We will be interpreted by all of those other entities that we interact with, regardless of genus or species. One way to summarize the discussion to this point in question form is "How might Charley Peirce conduct field research among the Pirahãs in the Amazon?" Let's think about what would be required. One arrives in a new place and for the first time hears the target language of study.

One difficult linguistic feature in any language to analyze is whether that language is tonal or not and, if it is tonal, how many tones it has.²² Pirahã was analyzed by my predecessor, Steven Sheldon, as having three distinct tones - high, mid, and low.

The following are some examples used to support the previous analysis proposing three phonemic tone levels. These data are based on minimal pairs (surface tones given in letters. M = mid; L - low; H = high).

[ʔāòí] MLH ‘hand’

[ʔāōī] MMM ‘ear’

[ʔàòī] LLM ‘foreigner’

[ʔàòí] LLH ‘skin’

[ʔāòì] MLL ‘Brazil-nut shell’

[ʔāóī] MHM ‘basket’

In a theoretical framework which allows these types of “minimal pairs,” (see below) it is clear that the examples above argue strongly in favor of a three-tone analysis.²³

Closer phonetic reflection on this series, however, reveals that between the [o] and [i], in each of these examples a semivocalic glide [w] occurs. This is rather uninteresting phonetically since such a glide is expected in this position because it is a physically unavoidable vocalic transition. However, as any first-year linguistics student knows, such a glide has (at least) three possible interpretations: (i) it could be perceived as simply a trivial transition effect, needing

²² A tone language uses pitch to distinguish words (themes and rhemes), as consonants and vowels are used in this sense in all languages. Pitch at the level of the sentence is intonation.

²³ In phonology, minimal pairs are pairs of words or phrases in a particular language, that differ in only one phonological or signed element, such as a phonetic segment and have distinct meanings. They are used to demonstrate that two phones represent two distinct, native-speaker perceived sounds in the language, i.e. that they are allophones of separate phonemes.

nothing more than a footnote; (ii) the glide could be functioning as a consonant /w/ in the language; (iii) this [w] could in fact be a vowel in underlying representation.

The determination of which option is correct will have serious implications for the analysis of Pirahã. But note that this determination is not automatic. In my own analysis, option (iii) was selected. This not only allows for prediction of stress placement, but also reveals a new and simpler tonal analysis, wherein [w] carries tone because it is an underlyingly vowel, /o/.

[ʔáòóí] MLHH ‘hand’

[ʔàòòì] MMMM ‘ear’

[ʔàòòí] LLMM ‘foreigner’

[ʔàòóí] LLHH ‘skin’

[ʔáòòì] MLLL ‘Brazil-nut shell’

[ʔáóóì] MHHM ‘basket’

This new distribution of tones, based on my reanalysis, leads to a different view of the tones, supporting my conclusion that Pirahã has only two, not three tones (as discussed in Everett (1979, 54ff)):²⁴

High Tone --> Mid Tone/ (before) __ Low Tone or (following) Extra Low Tone __.

²⁴ The original wording in Portuguese was:

Por exemplo, vamos propor as seguin -

tes regras ordenadas:

(8) A → M / { — B }
 { BB — }

(9) A → M / — M

Phaneroscopic and epistemological problems abound in understanding the novel semiotic system of an unknown (to the linguist) language. A further example of the empirical consequences of a minimal pair analysis may be seen in languages which manifest what has been termed “tonal displacement.” For example, Richardson (1971) discusses a phenomenon which he calls displacement, whereby tonal contrasts are realized several syllables to the right of their original position. The words [ný-kòlò] ‘sheep’ and [ný-kòlò] ‘heart’ in Sukama should differ, in that ‘heart’ etymologically carried a high tone on the last syllable. Yet both are pronounced identically in isolation, however. Compare the following forms:

ný-kòlò ný-tàalè ‘big sheep’

ný-kòlò ný-tàalé ‘big heart’

The original tonal contrast is realized not on the root but on the adjective big (cf. Hyman and Schuh 1974:103). This means that although words may be identical in isolation, they can reveal hidden contrasts in a larger context. Chapter six argues that this is an essential difference in Peirce's ideas to those of formal linguistics.

One final example in support of the thesis that fieldwork is a semiotic, pragmatistic enterprise, is the phenomenon known as “portmanteau.” A discussion of this is found in E. V. Pike (1974:24). A portmanteau phone (caused by what Pike (1967) calls the “wave” characteristic of language) is one etic sound (secondness) which is emically (thirdness) two phonemes. A unique phone, the one not part of a symmetrical pattern, for example, might turn out to be a portmanteau phone. When the units which make up the portmanteau phone are recognized, their occurrence should help to make symmetrical one of the nonsymmetrical patterns, recalling the diagram of Pirahã segments given above.

Before citing Pike's examples, we might observe that minimal pairs represent a "static perspective" in Pike's model. His theory (Tagmemics) requires analysis to use minimal pairs. Pike gives the following examples (among others) of portmanteau: Harris (1951:92) discusses a flapped nasal which occurs in some environments in some dialects of American English (as in, for example, painting [ɪ̃]) as actualizing the sequence /nt/. In Quiotepec Chinantec, the sequence /mi/ is actualized as a syllabic bilabial nasal [m] (Robbins 1961:245).

How do minimal pairs, portmanteau, and tonal displacement inform our understanding of Peirce's ideas in the philosophy of linguistics? Minimal pairs, if seen as deductive rather than abductive procedures, assume a method for delivering truth quickly and individually, seen as a part of an algorithmic rather than a heuristic procedure. Peirce would predict that they cannot do any such thing. And in fact they cannot. All linguistic analyses could use rethinking and redoing. Not because linguists are incompetent, but because linguistics, unlike mathematics, never draws what Benjamin Peirce, Jr. called "necessary truths." Field research in particular is a phenomenological experience in which the linguist is immersed, intensifying the need for community. The misleading idea that a solitary individual could find truth is not a problem for linguistics only. For example, in astronomy, a researcher might criticize a colleague's theory by noting that light rays and planetary motion in a particular section of the galaxy do not conform to this colleague's theory. Then the colleague may simply respond by saying, "Well, there's this thing called a 'black hole' up there which, although invisible, exercises an effect."

That effect is the sign that justifies linking it to the object, black hole. So, let's get some money from NASA and send up a rocket to check out the story. No black hole! Now we've got him! But, when presented with this new evidence, the shameless fellow replies, "You didn't find

evidence of a black hole because your instruments were fouled up by magnetic clouds in the area."

This type of thing can go on and on unless colleague b gets fed up and says, "Listen—I have had it with your old fairytales. I have developed a theory which explains all of these phenomena, simply and satisfactorily without black holes, magnetic clouds, and so forth." So it is with minimal pairs or any other methodology. They are only acceptable as post-analytic evidence *within* a theory. The lack of a theory rules all of the data in the world irrelevant. The question of whether a linguist controls his data well enough in the initial (firstness and secondness) stages of their fieldwork to presume that they have eliminated all but one of the variables in a pair of lexical items is relevant but not crucial to my point. This does remind us however, that "minimal pair" is not a phonetic concept. Minimal pairs as a proof in early analysis, the way that they at least once were used by linguists, violate phaneroscopy.

Field research reveals many otherwise hidden semiotic and phenomenological facts. One of my favorites comes from Sapir. In his 1921 book *Language*, Sapir (p172) talks of the need to understand the 'genius' of each language. By this Sapir refers to that which makes each language unique, the essential core of a language, that part less subject to historical change (a sort of Heraclitus-inspired question of what changes and what remains). Judging by his intellectual output, Sapir was always concerned with coherent fieldwork. His concern was with difference, the *relative* value of a given language. This is Pragmatism. Proceeding to look at individual cases via general theory. One good example of what I mean is found in a study he undertook of Nootka (nowadays known as either Nuuchahnulth or "Westcoast people," Wakashan, Canada) consonant alternations. In this language, as Sapir (1915, 181) observes, there are extremely interesting consonantal alternations that cannot be explained grammar-internally.:

"It is possible and often customary in Nootka to imply in speech some physical characteristic of the person addressed or spoken of, partly by means of suffixed elements, partly by means of 'consonantal play'. Consonantal play consists either in altering certain consonants of a word, in this case sibilants, to other consonants that are phonetically related to them, or in inserting meaningless consonants or consonant clusters in the body of the word. The physical classes indicated by these methods are children, unusually fat or heavy people, unusually short adults, those suffering from some defect of the eye, hunchbacks, those that are lame, left-handed persons, and circumcised males."

Sapir exemplifies this 'consonantal play', concluding that to understand the grammar of a language, we must therefore understand the culture in which that grammar is found. Sapir's study of Nuu-chah-nulth is well-known, of course. But perhaps it has failed to exert modern influence because it is considered to be a marginal example. This is an interesting example for various phaneroscopic/phenomenological reasons. For one, formal theories of linguistics have no way to address this type of semiosis, reduced to statements like "this falls outside of core grammar" or "This is not essential to a formal model."

And yet here we see culture, individual cognition, and phenomenology come together in a semiotically interesting way. It is related to the use of intonation in English to indicate sarcasm. A Nuu-chah-nulth speaker is considering their object and adds connotative information about them, culturally sanctioned or there would be no sign to use here. This requires understanding a general process, cultural values, psychological values, and so on. It is not quite a semiotic nexus of culture-language creation, although this is how it had to come into being.

Another example already seen comes from Pirahã. An iconic legisign becomes a symbol of negativity. Mentioned earlier, Pirahã (Amazonian language isolate) has two rare sounds



pointed out in Everett (1982). These sounds are [ɓ] and [ɺ]. The former is a voiced bilabial trill and the latter is a lateral-apical double-flap. These sounds are allophones of /b/ and /g/, respectively and, according to Everett (1979) and above, derive historically from *b and *d. The special interest of these sounds for our present discussion is that they are not used in the presence of non- Pirahã -speaking outsiders. This means that (i) Pirahã speakers are able to control sub-phonemic elements (a bit problematic for traditional views of the phoneme since speakers are not supposed to be aware of them) and that (ii) Pirahã phonology cannot be fully described or understood without a knowledge of how it interacts with culture. There are other recursive semiotic examples from Pirahã phonology. Let me present two of the strongest, in ascending order of importance for coherence. These are recursive because a sign serves simultaneously as a sign for gender (and because all signs are interpreted by other signs).

Pirahã women have a different phonetics and phonemics from Pirahã men. Pirahã women manifest a smaller articulatory space than Pirahã men. In general females' points of articulation are retroflexed compared to men's and the 'guttural sound' one associates with their speech is the result of contracting the walls of their pharynx. Further, women's speech often has one phoneme less than men's: where men's speech has both /s/ and /h/, women's speech has only /h/, both in those places where men pronounce /s/ and where men pronounce /h/. A full statement of the phonetics and phonology of Pirahã must, therefore, include gender-based differences and would be seriously incomplete without this additional data. A formal phonology would not care about this, but semiotically, pragmatically coherent fieldwork does.

But, one could ask, aren't these first two Pirahã examples just run-of-the-mill sociolinguistics? There is no such thing. Sociolinguistics shows semiotics in stark relief, necessarily. If extragrammatical considerations could in principle play a causal role in

phonological structures (not merely selecting them but forming them, to use a distinction made in Everett 1994), how would our conception of phonology change? What would constitute a 'causal role' for these factors in the phonology?

Here is a possible scenario. Imagine that a language could have various systems or modalities of sound structure, beyond its phonetics and phonology. And then consider the possibility that one modality can affect another, but not necessarily via constraint-rankings or rules, the standard devices of phonological theory proper. If so, then to understand the sound system of language, *L*, at any level (e.g. 'what happens' or 'what native speakers know when they know the sound system of their language') we must look carefully at the semiotic modalities of expression made available via an ethnography of communication and not merely at a supposed universal formal apparatus. Corollaries of this scenario might include, e.g. the appearance of new roles for old constraints (e.g. mode-faithfulness of segments being highly ranked to mark syllable types; syllables are maintained, a form of prosodic faithfulness, in order to parse the larger speech stream, not merely to enhance the perception of segments; and thus arguments for syllables may go beyond phonotactics and segmental enhancement and the syllable may have roles not envisioned by the so-called 'phonological hierarchy'). If this were true, the coherent fieldwork would evolve from a curiosity or desideratum to an imperative. Is there such a case? Indeed. Consider the following facts about Pirahã phonology, beginning with a review of its phonemes. The table below adds new information to the earlier tables of Mura and Pirahã phones.

Pirahã Consonantal Phonemes

p	t	*k	ʔ
b		g	
	(s)		h

Pirahã Vowel Phonemes

i		o
	a	

Recall that Pirahã has allophonic sounds found in no other language, each subject to cultural constraints. The /s/ above is in (s) because it is not found regularly in women's speech, but mostly in men's speech (there is some individual variation that I have not yet studied).

How does one experience this initially, though? The experience is of long, nearly incomprehensible words (for the smaller the phonemic inventory, the longer the words. In other words, paradigmatic complexity is inversely proportionate to syntagmatic complexity. Though this is one of the simplest segmental phonemic inventories in the world (the women's inventory does seem to be the simplest known), we should juxtapose alongside this simplicity, the complexity of Pirahã's prosodies. Pirahã's stress rule is a good place to begin, since it is well-known.

This rule, from Everett & Everett (1984), is considered one of the more complex and unusual stress rules in the literature, mainly for its phonological consequences (rather than, say, any difficulty in stating or recognizing it):

Pirahã stress rule: stress the rightmost token of the heaviest syllable type in the last three syllables of the word. The phonetic basis of "heaviness" is just this: Voiceless consonants are

always longer than voiced consonants and there are five syllable weights based partially on this contrast:

Pirahã 's five syllable weights: CVV>GVV>VV>CV>GV

Pirahã is a tonal language, as we saw. But, unusually, stress, tone, and syllable weight vary independently in the language. To see this, I will just review one simple set of examples below, from Keren Everett (1998). In the examples below, tone is independent of stress. ´ = high tone; no mark over vowel = low tone. The stressed syllable is marked by !. There are no secondary stresses.

!tígí	'small parrot'
!pìgì	'swift'
!sàbí	'mean, wild'
!ʔábì	'to stay'
tí!híí	'bamboo'
ʔì!tì	'forehead'
tì!ʔí	'honey bee'
tí!hì	'tobacco'

Thus alongside Pirahã's simple segmental phonology, we find an extremely rich set of prosodies. This leads us to ask a reasonable question, namely, does the language exploit this differential complexity in any way? Indeed, as Everett (1985) describes it, Pirahã communication makes crucial use of the channels below, where Hymes (1974) defines a channel as 'sociolinguistically constrained physical medium used to carry the message from the source to the receiver'. I prefer, however, to refer to these as "semiotic domains" (or semiotic "keys"). These semiotic keys function as a final cause for the organization of Pirahã's sound system, though they themselves reflect *the final cause of cultural preferences and values*.

Though I have discussed these data elsewhere (Everett 1979; 1985; 2008) it is worth reviewing them here to round out the picture of the effects of culture and phenomenological categories in creating new semiotic systems. As pointed out in Everett (1979; 1982; 1985) Pirahã phonological semiotics cannot be fully described or understood without a knowledge of how it interacts with culture. Here is why I think this.

The four principal modalities or channels in Pirahã after 'normal' speech are:

CHANNEL

FUNCTIONS

a. **HUM SPEECH**

Disguise

Privacy

Intimacy

Talk when mouth is full

Child language acquisition relation

b. **YELL SPEECH**

Long distance

Rainy days

Most frequent use – between huts &

across river

c. **MUSICAL SPEECH** ('big jaw')

New information

Spiritual communication

Dancing, flirtation

Women produce this in informant sessions more naturally than men.

Women's musical speech shows much greater separation of high and low tones, greater volume.

d. **WHISTLE SPEECH** (sour or 'pucker' mouth'

– same root as 'to kiss' or shape of mouth after eating lemon)

Hunting

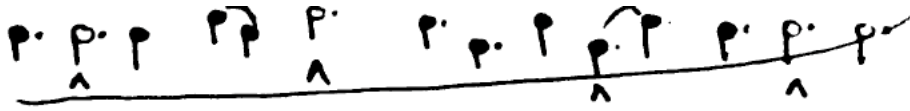
Men-only (as in ALL whistle speeches!)

One unusual melody used for aggressive play

The example below illustrates how prosodic signs in Pirahã are exploited to create these semiotic keys. The inventory in the tables above partially illustrate how little the segments contribute to the total set of phonological information in a given Pirahã word. In the example below we see that the phrase can be represented quasi-musically, as well as with consonants and vowels, which serves as the basis for the channels just summarized. In Everett (1984, 414) I illustrated this as follows:²⁵

²⁵ Some morpheme glosses have changed, since this early analysis, which I ignore here. This is to illustrate only the musical nature of Pirahã words.

kàp̀lìgà báàxáí xísìgíhíí xàhò}-sàí
 money good meat buy -nominalizer
 'Money's good for buying food.'



All channels must include the information in the second line above, though only the consonant and vowel channel needs to include the information in the first line. The notes represent syllables, with 'ties' indicating unbroken falls/rises in whistle speech.

In the musical form the tones are indicated by the pitch of the whistling, while syllable breaks are represented by breaks in the whistling. Moreover, stress (marked by ^ and ') is indicated in whistle speech by loudness, just as it is spoken speech). Thus, the syllable boundaries, stresses, and tones are clearly present in whistle (humming, and yelling) channels, even though the segments themselves are missing. The syllable in this case indicates length, offers an abstract context for tone placement, and the overall word is stressed according to syllable weight (see Everett (1988) for details). The syllable in these cases is a vital semiotic index for communication in differing channels - including the "normal" consonant-vowel channel, even in English. It plays a crucial role in parsing the input. It is now a semiotically-transformed syllable.

The evidence that these channels are connected to culture is based on the fact that they rely for their existence crucially on the syllable weights and stress rule above. The entire phonology of the language conspires to produce a system that relies more on prosodic channels and less on segments than many other sound systems in the languages of the world. These relationships are manifestations of the cultural choices for semiotic organization made by the Pirahãs at some point in their history (not conscious decisions, but emerging through cultural evolution). So, if nothing else, they help account for what is otherwise an anomalous level of complexity in the stress rule,

if we make the Peircean and Aristotelian assumptions that they serve as a final cause, constraining segments and prosody. This is itself interesting. The stress rule is a thirdness based on segments, but the very complexity of the rule in turn serves another semiotic function as an index in its own right, maintaining semiotic integrity across distinct semiotic domains. Yet the facts cut deeper than this. The simplicity of the segmental phonology merges with the complexity of the prosodic channels to create a unique set of semiotic keys, with the semiotics of the keys and communicative needs of this particular language-culture nexus serving as a final cause for the shaping of the system.

The following illustrate what Everett (1985) calls the 'sloppy phoneme effect' :

tí pái ~ kí pái ~ kí kíai ~ pí pái ~ ʔí pái ~ ʔí ʔai ~ tí pái, etc. (*tí tíai, * gí gíai, *bí bíai) 'me too'

ʔapapai ~kapapai ~papapai ~ʔaʔaʔai ~kakakai ~(*tapapai, * tatataí, * bababai, * gagagai) 'head'

ʔísihoái ~kísihoái ~písihoái ~píhihoái ~kíhihoái ~ (alternations with /t/s or involving different values for [continuant] or [voicing] are unattested) 'liquid fuel'

Pirahã allows a tremendous amount of variation among consonants, though not for the features [continuant] or [voice]. This can be accounted for, but only if we refer to Pirahã's semiotic domains. The ungrammatical examples above show that the features [continuant] and [voice] are linked in the sense that they may never vary in this way. Only place features may vary. With no reference to channels this is without explanation.²⁶ But in light of the variety of semiotic domains

²⁶ John Goldsmith, p.c., comments that: "your idea that the features continuant and voicing are special in several ways is remarkable---we need people to look for similar things in other languages." We don't have similar comments from other linguists in part, in my opinion, because people lack training in the sonic phaneron and those possibilities of it that extend beyond the accepted perimeters of common linguistic theories.

in Pirahã, this follows because [continuant] and [voice] are necessary for stress placement (Everett (1988)) which in turn must be preserved in every discourse channel, or the constraint below is violated:

Constraint on semiotic functional load and necessary semiotic contrast (Everett (1985)):

Greater Communicative Dependence on a Semiotic Channel → Greater Contrast

Required

Lesser Communicative Dependence on a Semiotic Channel → Less Contrast

Required

The claim is that without the study of semiotic functions, domains, and loads, and their role in a particular culture, not even an understanding of many language's segmental phonologies is possible.²⁷

The inventory above also partially shows how little the segments contribute to the total set of phonological information in a given Pirahã word. We see that the phrase 'There is a paca there' has a quasi-musical tonal representation (where an acute accent over a vowel represents high tone and no mark over the vowel means that the vowel has low tone), the basis for the channels just summarized.

kái?ihí?ao -?aagá gáihí

paca -poss/exist-be there

'There is a paca there.'

²⁷ A related example of semiosis and phonology in field work is the existence of a CVCVC reduplicative abstraction in Kamaiurá discussed below that has the same function as the syllable itself, as an icon and index of linguistic organization, but this abstraction is a mental index of a morpheme rather than merely segmental phonology. The syllable and the rules for arranging syllables in words, phonotactics, are types of indices, just as syntax is. They help us recover information.

All channels must include full prosodic information (stress, tone, length, intonation), though only the consonant and vowel channel or representamen series needs to include the vowels and consonants.

In the musical form there is a falling tone, followed by a short low, with a preceding break in the whistle (where the glottal stop, **ʔ**, would have been in **kaiʔhi**), followed by another short break (where the **h** would be) and a short high tone, and so on. Thus, the syllable boundaries are clearly present in whistle (humming, and yelling) channels, even though the segments themselves are missing. The syllable in this case indicates length, offers an abstract context for tone placement, and the overall word is stressed according to syllable weight (see Everett (1988) for details). The syllable in these cases is vital to communication in differing channels, primarily in parsing the input. Intonation is also important for delimiting the boundaries of sentences, paragraphs, and discourses. (see, inter alia, Everett (1979); Bolinger (1985; 1989))

But, once again, does the discovery of channels or alternating series of representamens like this imply any causal interaction between culture and grammar? Notice that these channels rely crucially on the indexes of syllable weights, tone, and the stress rule above. So, if nothing else, they help account for what is otherwise an anomalous level of complexity in the stress rule. Their function at one level is to serve as indexes for an interpretation of semiotic keys.

The lesson for the field researcher, semiotician, philosopher, and theoretical linguist to be drawn from these examples is just this: first, language and culture should be studied together as subsystems of semiotics; second, as a modality-dependent channel, phonology may be subject to constraints that are (i) language specific and (ii) grounded not only in the physical properties of the instantiating modality (the phonetics) but also on the culture-specific channels of discourse

employed. This is a very important result because it shows that the view that phonology is an interpretative component for the syntax (one of the "interface conditions" of the human computational system, in Chomsky's (1995) terms), are inadequate. This role fails to recognize the formal complexity of languages in context and the non-interpretational roles of the phonology; this semiotic behavior is not at any interface but shows a clearly independent semiotic role for the phonology. Such examples also show how coherent fieldwork can be useful for theory. Thus not only the fieldworker, but also the theoretical linguist must engage the language as forming a coherent whole with culture. And this in turn entails more culturally and semiotically informed fieldwork. In fact, these just *are* fieldwork.

The lesson is just this: as a modality-dependent semiotic domain, phonology is subject to constraints that are (i) language specific and (ii) grounded not only in the physical properties of the instantiating modality (the phonetics; the objects of the phonetic signs) but also or alternatively on the culture-specific semiotic domains contributing to each discourse.²⁸

It seems to me that such findings also provide some understanding for James's proposal that the study of 'Universals' is no more vital than the study of 'Particulars.' I reject this idea in its extreme form for a number of reasons, not least of which is that it seems to come from James's nominalism, in which particulars are real and universals are not. But it resonates with the nominalistic pragmatism of the Pirahã, as discussed in Appendix One.

²⁸ This is a very important result even for formal linguistics. It shows, for example, that the so-called 'interface conditions' of the "Human Computational System," in Chomsky's (1995) terms, may range beyond phonological and logical forms, if we define an interface system as a system setting bounds on interpretability for the "computational system" (one need not believe there is any system to be characterized in this way - I do not - to see the relevance). Such examples also show how coherent fieldwork can be useful for theory. Thus not only the fieldworker, but also the phonologist must engage the language as forming a coherent whole with culture. And this in turn means more fieldwork, the reconsideration of old phonological themes, new training for graduate students, new data-bases, and on and on.

Practically, James's view resonates because, among other things, the study of particulars leads to knowledge of the perimeters of language, setting the outer boundaries. This is also consistent with research by Ladefoged and Everett (1996), in which it is found that there are phonetic rarities, particulars, which are simultaneously violations of distinctive feature theory (phonology's theory of where segments come from) yet not ignorable nor solvable by that theory. That is, that these rarities are particulars with general theoretical import qua particulars. Let us move now to some practical considerations in fieldwork.

What this chapter has endeavored to show is that fieldwork is a prime testing and application ground for pragmaticist principles and that pragmatism serves as perhaps the ideal framework for field research.

