LIGHT FROM THE DARK AGES
OF CHOMSKY AND HALLE'S "ABSTRACT PHONOLOGY"

Wietze Baron

Summer Institute of Linguistics

The claim that its model constituted a hypothesis, somehow reflecting the linguistic organization of the mind, probably helped to bring fame to the Phonological Theory that found its most formal and explicit exposition in Chomsky and Halle's 'The Sound Pattern of English' (1968). It is interesting to see that this very claim of psychological reality is now being used against its standard formulation in a number of revisionist proposals. For example, Vennemann, although owing his "light" largely to articles written during the era (Postal 1968, Kiparsky 1968a&b) refers to it as the "dark ages" of Chomsky and Halle's "abstract phonology" and rejects analyses of the following type (taken from Schane 1974 and based on Flora, 1974). In Palauan the following forms are found:

(1)	Present Middle Verb	Future Participle (conservative)	Future Participle (innovative)	
	mə-danəb	dənob-l	dənəb-all	'cover opening
'	mə-te?əb	tə?ib-l	tə?əb-all	'pull out'

Stress placement is dependent upon the presence of a suffix, and falls on the final vowel of the word if a suffix is present, and on the penultimate vowel when no suffix is present. Schane argues convincingly that /danob/ and /te^{7}ib/ should be considered the underlying forms. The surface forms are then derived after stress placement by the following simple rule:

(2)   V → ə / ___
                [-stress]

We get the following derivations:

Underlying form:	ma-danob	danob-1	danob-all	ma-te?ib	te$^?$ib-1	te?ib-all
Stress placement:	madánob	danóbl	danobáll	maté?ib	te?íbl	te?ibáll
Vowel reduction:	mədánəb	dənóbl	dənəbáll	məté?əb	tə$^{?i}$b1	tə?əbáll

The analysis makes sense, catches a significant generalization, and is explanatory. Vennemann, the originator and most extreme proponent of Natural Generative Phonology (NGP), rejects it, however, on the basis that "psychological reality of the 'patched' lexical representations has never been established" (Vennemann 1974:352).

Of course Vennemann was already committed to this position because of a constraint he had proposed on underlying structures (taken from Hooper 1976:116 and based on Vennemann, 1971). The constraint can be summarized as follows:

I   *Underlying forms should be identical to their phonetic representation or, in case of alternants, to the phonetic representation of at least one of their allomorphs.*

Even Joan Hooper (1976:17-18) though basically writing within the same theoretical framework, does not concur with Vennemann on this. She appeals to an extended concept of the archisegment, though the argument seems to lack conviction.

A weaker form of the constraint, however, might save the day for the Palauan analysis:

Ia   *Underlying forms should not contain segments which do not surface, or in the case of alternants, do not surface in at least one of the allomorphs.*

Any argument against Ia is in fact an argument against I.

Another NGP departure from the Standard Theory involves the notion of rule ordering. Basic to this view is the following assumption:

II   *Rules apply whenever their structural description is met.*

As it stands the principle is too strong. In an effort to preserve psychological plausibility, rules are grouped into three ordered blocks: Morphophonemic Rules, Sandhi Rules and Phonological Rules (Hooper 1976:17-18; Nichols 1978:16, 25). The principle that remains is known as the principle of Intrinsic Rule Ordering or as the Universally Determined Rule Application hypothesis (UDRA)[1]:

IIa   *Rules are intrinsically ordered.*

In presenting some data from the Fas language[2] we will be addressing ourselves to these two constraints (Ia and IIa).

Consider the imperatives (2nd person singular) of set (3):

(3) 1pers.sg. (Past Tense=stem)   Imperative (sg)

pən	pənɛ	'go!'
ɛt	ɛtɛ	'build!'
has	hasɛ	'show!'
taty[3]	tatyɛ [tadyɛ]	'shoot (pl.object)!'
oky	okyɛ [ogyɛ]	'look after (it)!'

There is no doubt that the imperative suffix is -ɛ. Consider now the forms in set (4):

(4)   təpw   təpwɔ [təbwɔ]   'cut!'
      səfw   səfwɔ   'hold!'

A simple rule will account for these forms:

(5) Vowel Backing (VB)

$$\varepsilon \rightarrow \mathrm{ɔ} \; / \; \mathrm{w} \; \_$$

That this rule is a phonological rule and not an idiosyncrasy of the Imperative forms can be seen in the data of set (6):

(6)   ɛro   'that'
      man ɛro   'that stringbag'
      ɓak[4] ɛro   'that fence'
      aty ɛro   [adyɛro]   'that banana'
      popw ɔro   [pobwɔro]   'that knife'
      mamw ɔro   'that fish (a species)'

Now compare the paired forms in set (7):

(7)   'that'   ano   'this'
        fɛ ɛro   fa ano   'excreta'
(cf.   fa ɛro   fa ano   '(his) child'
        aɓɛ ɛro   aɓa ano   'axe'
        fəsɛ ɛro   fəsa ano   'grandchild'

Note that [ɔ] remains unaffected in set (8):

(8)   kɔ ɛro   kɔ ano   'stem'
      ɓɔ ɛro   ɓɔ ano   '(name of) man'
      myɛkɛ fɔ ɛro   myɛkɛ fɔ ano   'old garden'

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The rule then can be simply stated:

   (9)   <u>Assimilation (ASS)</u>

      ɛ → a / __ a

The phenomena become interesting when we are faced with the data of set (10):

<u>(10)</u>	kwɔ ɛro	kwa ano	'tree (a species)'
cf.	kwa ɛro	kwa ano	'hair'
	fwɔ ɛro	fwa ano	'(female role in) dancing'
Cf.	fwa ɛro	fwa ano	'smell'
	akwɔ ɛro	akwa ano	'ground'
	fɔkwɔ ɛro	fɔkwa ano	'rib of a sago leaf'
	etc.		

So what has happened to our simple rule (9)? An exclusively surface oriented approach would lead to two rules which could possibly be collapsed:

   (11)   ɛ → a / __ a

           ɔ → a / w __ a

This account, however, fails to recognize the existence of rule (5) and its integration in the overall system. A solution violating both constraint Ia as well as IIa is available if we posit the underlying forms kwɛ/fwɛ/akwɛ/fokwɛ, etc., and order the rules as 1. E Assimilation and 2. Vowel Backing. This would result in the following sample derivation:

	kwɛ	ɛro	kwɛ ano	c f.		kwɛ ɛro	kwɛ ano
E. Ass.		-	kwa ano		V.B.	kwɔ ɛro	*kwɔ ano
V.B.	kwɔ	ɛro	-		E.Ass	does not apply	

      Notice that both constraints are violated. First of all, we have posited an underlying segment which does not surface in any of its allomorphs. Secondly, because the NGP rule order principles are ineffective (both rules are phonological rules), it appears that we have made crucial use of rule ordering, that is, we have incorporated extrinsic rule ordering.[5]

      For a second example consider the forms of set (12):

<u>(12)</u>	ogna	'to look for'
	kɛdya	'to finish'
	nabwən	to come'
	pɔbra	'to get (plural object)'

Since the language has no voiced stop phonemes, the phonetic voiced stops are accounted for by a voicing rule:

(13) Voicing Assimilation (VA) [6]

$$\begin{bmatrix} -son \\ -cont \end{bmatrix} \rightarrow + voice\ / \underline{\quad} \begin{bmatrix} -voc \\ +voice \end{bmatrix}$$

Two other pervasive processes are illustrated by sets (14) and (15):

(14)		-o	(Sg.) Possessive suffix
	nək	nəko	'of the tree (a species)'
	wat	wato	'of Wat (a man's name)'

(15)	any	anu	'of the vine (a species) '
	ɛsy	ɛsu	'of the sago pudding'
	asɛry	asɛru	'of Asery (a man's name)'

The rule is operative throughout the language and will be informally stated as:

(16) y o → u

A related process can be witnessed in the verb paradigms. Verbs are categorised by whether -y(-) occurs in the person marker (set 17):

(17)	sleep	eat
We	kət	kəty
We (2)	kəta	kətya [kədya]
They	kəse	kəsi

[kəsi] in fact also has -y- in its underlying form /kəsye/ and the surface form is derived by the following rule:

(18) y e → i

The rules are related and we will therefore treat them as one rule:

(19) High Vowel Formation (HVF)

$$\begin{bmatrix} yo \\ \\ ye \end{bmatrix} \rightarrow \begin{bmatrix} u \\ \\ i \end{bmatrix}$$

Now notice the interesting occurrence of voiced stops in set
(20):

(20)	nəky	nəgu	'of the pawpaw'
	aty	adu	'of the banana'

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The phenomena could be easily explained if extrinsic rule ordering is accepted. Compare the following derivations:

	nəky+o	'of the pawpaw'		nəky+o
V.A.	nəgyo		HVF	*nəku
HVF	nəgu		VA	inapplicable

Once this analysis is accepted we can extend the solution to non-alternating forms such as:

[ɛbi]	'wild sago'
[idi]	'arrow'
[səgu]	'like'

and we may posit the following underlying forms and apply the rules in the given order:

	ɛpye	itye	səkyo
Voicing	əbye	idye	səgyo
HV Formation	əbi	idi	səgu

Notice that once more the constraints Ia and IIa have been violated. First of all, we have had to posit underlying segments which never surface, and secondly, because the NGP rule ordering principles are once more ineffective, we have had to employ extrinsic rule ordering. [7]Consequently, there is some strong evidence that the given constraints are too strong. We conclude, therefore, that the dark ages of Chomsky and Halle's 'abstract phonology' were not so dark as to prevent some light from illuminating Fas phonology.

NOTES

1. The UDRA hypothesis is also strongly advocated by another approach, now known as the KSN proposal, after the leading article by A. Koutsoudas, G. Sanders, and C. Noll (1974). This school does not object to abstract underlying forms as such but seeks to constrain the theory by the given constraint and a number of interesting rule order principles. For an investigation of these fairly complex principles in the light of the Fas data, see my 'Fas Phonology' (forthcoming).

2. The Fas language, a member of the posited Kwomtari Phylum, is spoken in the West Sepik. I am especially thankful to my friend and language teacher, Yetin Usfani. This paper was presented to the Linguistic Society of Papua New Guinea in September, 1979.

3. In word final position the symbols y̱ and w̱ represent the voiceless high vowels [i̥] and [u̥]. They take on voiced and non-syllabic functions when followed by vowels.

4. The symbol /ƀ/ represents the rare bilabial trill which is characteristic of the Fas language.

5. Only recently, Koutsoudas (1978) has pointed out that refutation of certain concrete rule order principles does not imply refutation of the UDRA hypothesis itself, since the correct applicational principles may still await discovery.

6. It is debatable whether the preceding vowel is a necessary part of the context. Word initial stops also seem to take on voicing when preceding semi-vowels, though to a lesser degree.

7. The rule, in fact, consists of two consecutive processes. An explication of these is not relevant for the purpose of this paper.

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