

helplessly, "Blueberry, that's my nickname!" Our uneasiness was not stilled as we proceeded the rest of that afternoon to make a series of grammatical corrections only to find that every one had mysteriously been anticipated, including the final entry, "God"!

As we slowly began to impose some order on the botanical material, I became obsessed with doubts about the value of my collection. I was well aware that a project which had brought together 3000 specimens, 22 informants not always sober, and countless thousands of names would demonstrate inconsistencies. So, for reassurance, I turned to the results of our mushroom picking—a mere 200 specimens, four informants, and 100 names. I paired the Tzotzil generic names with their Latin generic determinations to produce the simplified chart (Figure 1).

One wishes, of course, to have not merely generic but specific Latin identifications, but the mycologist protested that this was impossible as I had not provided him with a thorough comparative description of the specimens' flavors. I had, in fact, asked my wife, who loves raw mushrooms, to taste the specimens and record their flavors. I learned the limits of her loyalty.

Figure 2 shows how even the mushroom specimens considered edible by the Zinacantecs are linked by their Linnaean identifications in a complex way. For instance, *eahal čikin* is a mushroom of the genus *Lactarius*. *Mana yok* belongs to *Lactarius*, but also to *Cantharellus*, *Clitocybe*, and *Collybia*. It also belongs to *Cortinarius*, *Mycena*, and *Tricholoma*, but not to *Lactarius*, *Cantharellus* or *Clitocybe*! At least, after having implicitly trusted my informants and feasted on many a leftover mushroom I was relieved to learn that not a single deadly specimen had found its way into this category.

Mushrooms are of minor importance in the diet, but no plant is more central to Zinacantec culture than corn. Everyone grows corn, everyone talks about corn, everyone depends upon corn for his survival. My collaborators from Zinacantán Center collected twenty ears of corn (*ʔišim*) which they claimed were different from each other and which they called by different names. When I was still in Chiapas I strung the ears up across the room and brought in five men, each from a different hamlet. I asked them to name the corn. They could handle the ears, chip off kernels, and so forth. If each informant had assigned a different name to each ear there would be 100 names. Here are the results.

TABLE 1.—"A Maze"

Race of maize	A	B	C	D	E
Dzit-Bacal .....	lae ʔišim	k'oš napalu? bik'it napalu?	bik'it napalu?	lae ʔišim	sakil napalu
Dzit-Bacal .....	sakil ʔišim	muk'ta napalu?	sakil ʔišim	sakil ʔišim	sakil napalu ʔišim
Dzit-Bacal Mixed with Negro ..	pinto ʔišim	pinto ʔišim ʔolon ʔosilal pinto ʔišim	pinto ʔišim	ʔik'al pinto ʔišim	ʔik'al tempranero ʔišim
Imbricado .....	masanil ʔišim	muk'ta sakramental ʔišim	sakil ʔišim	ye e'i? ʔišim	sakil ʔišim
Imbricado Mixed .....	eahal ʔišim	eahal ʔišim lae ʔišim	eahal ʔišim	eahal ʔišim	eahal ʔišim
Nal-Tel Blanco Tierra Alta .....	k'oš sakil ʔišim	sikilal ʔosil ʔišim	sakil ʔišim	sakil ʔišim	sakil ʔišim
Nal-Tel Mixed with Negro .....	pinto ʔišim	muk'ta pinto ʔišim	pinto ʔišim	pinto sakil ʔišim	pinto ʔišim
Nal-Tel Mixed with Negro .....	k'oš masanil ʔišim	bik'it sakramental ʔišim	k'ob-e'i? ʔišim	čimpo ʔišim	sakil ʔišim
Nal-Tel Mixed with Oloton .....	sakil ʔišim	sikilal ʔosil ʔišim	sakil ʔišim	sakil ʔišim	sakil ʔišim
Negro de Chimaltenango .....	ʔik'al ʔišim	sikilal ʔosil ʔik'al ʔišim	ʔik'al ʔišim	ʔik'al ʔišim	ʔik'al ʔišim
Olotillo .....	k'oš napalu?	bik'it napalu?	napalu?	napalu?	sakil napalu
Olotillo .....	napalu?	ʔolon ʔosilal ʔišim	lae ʔišim	sakil ʔišim	sakil pača ʔišim
Olotillo Mixed with Nal-Tel ....	lae sakil ʔišim	lae ʔišim	---	napalu?	sakil ʔivriro
Olotillo Mixed with Salpor .....	k'oš lae ʔišim	ʔolon ʔosil bik'itik lae	---	---	sakil ʔivriro
Olotillo Mixed with Salpor .....	sakil ʔišim	vietikal ʔišim	vietikal ʔišim	teheringo ʔišim	sakil muk'ta masanil ʔišim
Quicheño Mixed .....	muk'ta k'anal ʔišim	sak-vayan sikilal ʔosil ʔišim	sak-vayan k'anal ʔišim	k'anal ʔišim	eahal ʔišim
Quicheño Rojo Mixed .....	eahal ʔišim	vietikal eahal ʔišim	eahal ʔišim	eahal ʔišim	eahal ʔišim
Quicheño Amarillo Mixed .....	k'anal ʔišim	čiš-te'ʔal ʔišim čiš-te?	k'anal ʔišim	k'anal čiš-te? ʔišim	bik'it k'on
Quicheño Modified by Teocinte .....	k'anal ʔišim	k'anal ʔišim	k'anal ʔišim	k'anal ʔišim	k'anal ʔišim
San Marceño Mixed .....	muk'ta k'on	muk'ta k'anal ʔišim k'anal masanil ʔišim	k'anal tušteko	k'anal čimpo	tuštail k'on
San Marceño Mixed .....	k'anal ʔišim	ʔolon ʔosilal muk'ta k'on	k'anal ʔišim	k'anal ʔišim	vietikal k'on

Tzotzil Generic Names

Latin Generic Names

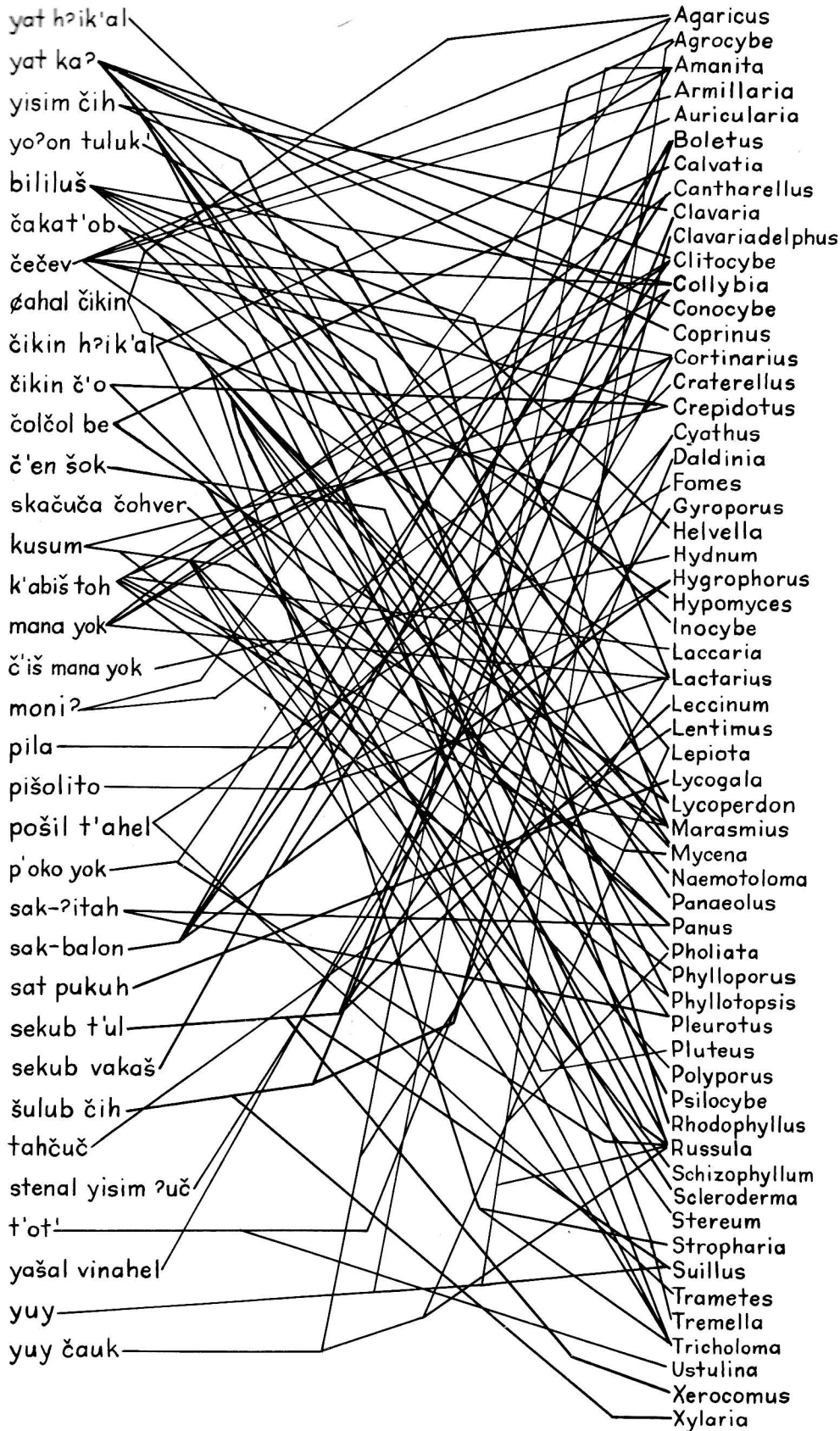
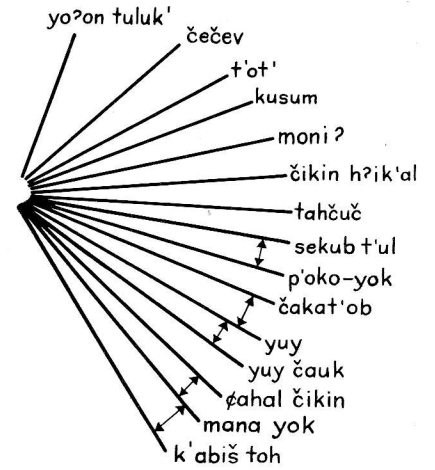


FIGURE 1.—Mushroom or toadstool?



↔ = span of Latin genera shared by Tzotzil generic names

FIGURE 2.—Edible fungi chart illustrating overlap of Tzotzil generic names.

For these 20 ears that Dr. Paul Mangelsdorf assigns to 16 races there are 47 different Tzotzil names. Forty-one descriptive terms of such things as shape, color, habitat, season, and size are used to produce a majority of the distinctive names. Despite this extraordinary diversity, which might lead one to believe that these men were thoroughly confused by the array of corn—and they confessed bewilderment at the time—not a single one mistook an ear of highland corn for an ear of

lowland corn, while the mistakes in identifying temperate corn that grows in the foothills only confirmed its intermediate quality.

Escaping from my unlettered Tzotzil informants, I sought reassurance from a group of undergraduates and Smithsonian colleagues sharing a literate, bookish culture. I gave them a simple test. The instructions were to look at each of 15 flash cards and write down what they called the thing.

TABLE 2.—“Bug Test,” based on Teach Me About Insects Flash Cards (“one of a series that trains young minds to think !”)

Bug	A	B	C	D	E
1. Luna moth .....	moth	moon moth	moth	“[type of moth]”	fairy
2. Millipede .....	millipede	centipede	worm	<i>caterpillar</i>	centipede
3. Ichneumon fly .....	wasp	mosquito?	termite	termite?	wasp
4. Giant walking stick .....	stick bug	stick insect	<i>katidid</i>	walking twig	insect
5. Japanese beetle .....	Japanese beetle	beetle	beetle	beetle	beetle
6. Green peach aphid .....	aphids	aphids	bug	”[type of insect]”	beetle
7. Earwig .....	Cincho beetle	?	bug	cricket?	insect
8. Katydid .....	grasshopper	grasshopper	grasshopper	grasshopper	praying mantis
9. Firefly .....	firefly	?	<i>lightening bug</i>	moth	bug
10. American cockroach .....	cockroach	?	roach	“[type of insect]”	but
11. Common silver fish .....	Blattera americana				
12. Cotton boll weevil .....	“bug---”	?	bug	“[type of insect]”	silverfish
13. Bald-faced hornet .....	“bug---”	aphid	bug	termite	mosquito
14. Monarch butterfly .....	bee	wasp	wasp	wasp	bee
15. Black widow spider .....	Monarch butterfly	Monarch butterfly	<i>butter fly</i>	Monarch butterfly	butterfly
	black widow spider	spider	black widow spider	black widow spider	black widow spider

Notice the spelling mistakes (italicized)—no problem in Tzotzil. Look at the “fairy” (No. 1E). The most knowledgeable informant correctly identified half of the insects. Following their judgment, I would confidently name No. 8 “grasshopper.” But even Dr. Seuss would be hard put to invent a creature sharing the attributes of aphid, termite, and mos-

quito (No. 12). Everyone knows the song about the boll weevil, “I’m looking for a home.” Well, he’d find no home in this people’s dictionary!

Agreed that college students don’t know their entomology. How about cars?

TABLE 3.—“Kandy-kolored Tangerine-flake Streamline Baby Test,” based on color photographs selected from dealers’ brochures of current 1967 models

	A	B	C	D	E
1. Ford Fairlane Wagon .....	Chevy II Station Wagon	White Chevy Station Wagon	?	White station wagon, Rambler	Chevrolet Station Wagon
2. Ford XL 2-Door Hardtop ..	Ford sports car	Red Thunderbird	Ford	?car	2-door hardtop
3. Ford XL Convertible .....	Ford convertible	Yellow ? convertible	?	Yellow convertible, Pontiac	Pontiac convertible
4. Chevrolet Corvair .....	Corvair	Chevelle, plum sedan	Mustang? or Corvair?	Purple Corvair, Chevrolet	Corvair 4-door sedan
5. Chevrolet Camaro .....	Camaro	Ford—blue Mustang	Chevy Super-sport	Ford, Mustang?	2-door hardtop
6. Chevrolet Malibu .....	Pontiac	Pontiac convertible, green	?	Green Cadillac	4-door hardtop
7. Dodge Dart .....	Dodge	Brick red sedan	Thunderbird	Buick	2-door hardtop
8. Ford Thunderbird 2-Door Hardtop .....	Thunderbird	Red Chevy sedan	?	Thunderbird hardtop	2-door hardtop
9. Chevrolet Biscayne 2 seat Wagon .....	Chevrolet station wagon	Chevy blue station wagon	A station wagon	Blue station wagon, Plymouth	Station wagon
10. Ford Thunderbird .....	4-Door Thunderbird	Blue Lincoln convertible	?	Lincoln? Chrysler Imperial?	Thunderbird 4-door sedan

The best informant correctly identified eight out of ten, the rest, despite Madison Avenue, only two or three. Look at those names and think of them as potential dictionary entries. Three out of five know that Ford is a Chevy (No. 1) and one knows that Chevy is a Cadillac (No. 6D). Look at the personal distinctions: "2-door hardtop" vs. "4-door hardtop" (informant E), "plum" vs. "brick red" (informant B). Look at the syntax: "White Chevy Station Wagon" (No. 1B); "White station wagon, Rambler" (No. 1D); "A station wagon" (No. 9C). Rubbish! Remember we are searching for

truthful identifications, that is, not deceptive ones. Consider the results above in the light of truth, truth as "conformity with fact, agreement with reality, agreement with the thing represented, the actual state of the case" (C. T. Onions [ed.], 1955:2258).

Disappointed in the blatant ignorance of American youth represented above, my research assistant and I puzzled over what domain of knowledge was as rich in vocabulary and as important to American culture as corn to Zinacantec culture. We chose breakfast foods.

TABLE 4.—"Flapdoodle (food for fools) Test"  
(x = correct answer; - = no answer)

Informants	TEST 1.								
	<i>Apple Jacks</i>	<i>Lucky Charms</i>	<i>Sugar Pops</i>	<i>Wheaties</i>	<i>Froot Loops</i>	<i>Corn Flakes</i>	<i>Toucan Food</i>	<i>Grape Nuts</i>	<i>Rice Chex</i>
A.	-	-	x	Bran Flakes	x	x	-	Wheat Germ	x
B.	x	Lucky Stars	x	Bran Flakes	Colored Sweet Cheerios	x	Chicken Feed	x	Wheat Chex
C.	x	-	x	x	Trix	x	Chicken Feed	Pep	x
D.	Sugared Cheerios	Oat Cereal with Marshmallow	Kix	Grapened Flakes	x	x	Chicken Feed Barley	Pep	Rice Chex
E.	Cheerios	Cereal		Corn Flakes	Cheerios	x	Cereal	Cereal	Wheaties
F.	Frosty O's	Weirdo Flakes	x	x	Colored Cheerios	Plain Flakes	Granules	Krunchies	Wheat Checks
G.	OK's	Floaties	x	x	x	Post Toasties	Grapenuts Flakes (crushed)	x	x
H.	Shit	Shit	Shit	Shit	Shit	Shit	Shit	Shit	Shit
I.	Orange O's	Candy Alphabet Cereal	Sweet Corn Cereal	Wheat Flakes	Raspberry Orange & Yellow O's	x	Raisin Bran	Bran	Shredded Wheat
J.	x	Party Mix	x	Corn Flakes	Party Mix Number 2	-	Fertilizer Scented Breakfast Food	Wheat Germ	x
TEST 2.									
K.	Frosty O's	x	x	x	x	x	-	Special K	Corn Chex
L.	Frosty O's	Alphabits	x	Product 19	x	x	Dog Food	-	Wheat Chex
M.	Frosty O's	x	Puffa Puffa Rice	Special K	x	x	Dog Food	-	-
N.	Cheerios	Alphabets with Marshmallow	Puff Rice	x	x	x	-	-	Wheat Chex
O.	Frosty O's	Alphabets with Marshmallow	Puff Rice	Protein	x	x	-	-	Wheat Chex
P.	Frosty O's	Alphabets with Marshmallow	Puffed Rice	x	x	x	Dirt	Oatmeal	Wheat Chex
Q.	Frosty O's	x	x	Brand K	x	x	Dog Food	-	Corn Chex
R.	Frosted Cheerios	Stars	x	Country Corn Flakes	x	x	Bran Flakes	-	(not included)
S.	Frosted O's	x	x	Country Corn Flakes	x	x	Grape Nuts	x	"
T.	Frosty O's	x	x	All Bran	x	x	Grape Nuts	Germ	"
U.	Trix	Alphabets	Sugar Puffs	x	x	x	-	Wheat	"
V.	-	Candy Wheat	Rice	-	-	x	Grain	-	"
W.	Frosty O's	x	x	x	x	x	Wheat Germ	Bran Buds	"
X.	Frosty O's	x	Sugar Puffs	x	x	x	Wheat Germ	Post Toasties	"

Dishes of cereal were offered for inspection and tasting first to white college students and then to black high school students. In the first test the subjects gained a total score of 36 percent correct, each informant correctly identifying from five out of the eight cereals to no cereals (unless one credits the informant who identified them all as "shit" as an appropriate response). In the second test the number of correct answers rose to 53 percent, ranging also from five out of the eight cereals correctly identified to two cereals out of eight. Comparing the two results it appears that white college students are most familiar with Sugar Pops and Rice Chex while black high school students score best on Cornflakes and Froot Loops, each group scoring very low on the other's favorite breakfast food. One could deduce from the names ascribed that there is a negative corollary between knowledge and inventiveness. The more highly educated were more ignorant yet more inventive and facetious. Similarly there were many fewer students of the first category who left blanks on the answer sheet. One could deduce that the less educated are less compulsive, soberer, and more honest, or perhaps that blacks are less compulsive, soberer, and more honest than whites.

The plethora of names is reminiscent of the Zinacantecs' labeling of corn. The eight kinds of actual cereal are dubbed with 53 names! As with the Zinacantecs, it is difficult to determine which names are authentic and which are merely descriptive. Regardless of race or level of education the number of informants who were duped into believing that Toucan Food was a kind of cereal is disturbing, though I must confess that I later learned that what the pet shop had represented to me as special bird food was in fact dog food! The errors of substance are astonishing—Rice Chex are identified eight times as wheat, five times as rice, and twice as corn. Not only is there a failure to identify the substance properly, but even the form is misconstrued. How could Grape Nuts possibly be described as "flakes" (R7)? The levels of discrimination, too, are thoroughly mixed; cereal, flakes, food, dirt, grain, germ, granules, protein, wheat. If majority is master than we can conclude safely that Cornflakes, Froot Loops, Sugar Pops and Frosty O's are correctly identified. But un-

like the Tzotzil names for corn there is *one* and only one genuine name for the product contained in the box labeled "Apple Jacks" and that name is not "Frosty O's," "Frosty O's," or "Frosted O's" despite the claims of ten of the fourteen black informants. Majority rule does not assure the truth.

As a last resort, I gave a greatly simplified test to ten college professors (anthropologists and linguists)—ten vegetables were handed to them for identification. They scored 58 percent correct, the best informed individual identified nine out of ten, the dullard scored two and a half (with half points for partial identification).

Demoralized by the apparent inability of most Americans to master the most mundane domains of common knowledge, I retreated and restaged one of my techniques that had proved most successful in the field for narrowing the range of meanings. I tossed a doll on the table and asked those present to describe it in one word. They replied, "lying," "crying," "flopped," "sprawled," "raggedy," "prone," "sleeping," "supine," and "dead." I wondered at the success of my efforts in Chiapas. I worried over experiences that were as common to English speakers as to Tzotzil speakers, but which stubbornly evaded labels. I tested the ingenuity of my colleagues by having a boy come in, put his finger in his cheek and pop it. Q: "What was that?" A: "Somebody just stepped in and made a popping noise." Q: "What do you call it?" A: "There's no word for it."

Quite opposite is the problem presented by those in the know. Take for instance hunters' names for ducks. The ruddy duck has nearly one hundred colloquial names including such diverse titles as blatherskite, booby, bumblebee-buzzer, chunk duck, dopper, dummy duck, fool duck, god-damn, greasey, Johnny Bull, paddywack, sleepy brother, soldier duck, spoon-billed butterball, tough-head, and wiretail (Kortright, 1953:364).

Samuel Johnson has said: "The rigour of interpretative lexicography requires that the explanation, and the word explained should always be reciprocal" (Johnson, 1797:9). I gave a final matching test to five of my literate informants with glosses from *Webster's Third New International Dictionary*.

TABLE 5.—"Semantic Differential Test"

Words	Definitions
1 blue.....	low in spirits
2 wretched.....	deeply afflicted, dejected, or distressed from want, disease, or mental anguish
3 peevish.....	querulous in temper or mood
4 woebegone.....	exhibiting a condition of suffering, sorrow, or misery
5 surly.....	repelling, churlish, or rude sulkiness
6 morose.....	bitter, cynical, or misanthropic uncommunicative ill humor
7 saturnine.....	heavy, forbidding, taciturn gloominess
8 wistful.....	musingly sad



Only one word was correctly matched by all informants—"blue." One informant correctly paired six out of eight. The remaining scores were too shameful to reveal. I was tempted to conclude reluctantly with Dr. Johnson that "most men think indistinctly, and therefore cannot speak with exactness" (Johnson, 1797:12), but it seems more likely that the fault lies not in my informants' lack of native ability, but rather in their lack of instruction and their unfamiliarity with literary aspects of the English language.

In the absence of a dictionary, in the absence of recognized authorities, who is your authority? Is it the majority? Is it the people? The above array of popular wisdom is disconcerting.

Frank Cancian was able to derive further clarification of the structure of the Zinacantan religious hierarchy by utilizing his informants' errors, but he was sufficiently canny to choose a domain where error could be readily determined and measured (Frank Cancian, 1963a). Either a man was "grand alcalde" in 1956 or he was not. My own attempts to sort out the rubbish were not marked with such success.

A task allied to the problem of meaning was the proper sorting out of roots and their classification by types. I had replied on Terrence Kaufman's advice from the very start in establishing grammatical classes. His comparative knowledge of Mayan languages would be especially useful. So we spent a Christmas season poring over the vocabulary trying to delineate homonymous roots, and trying to generate a syntactic system that would take into account the various assemblages of words under one root. Even after days of persistent sifting through the mass of material, we had only reached halfway through the alphabet. What at first had seemed would be a realistic and simple linguistic ordering soon became cluttered with innumerable anomalies. The flu and the mindless variety of linguistic facts drove us to despair. It was left to me to continue to the end, supported by long distance calls to my mentor for help. I don't believe it is false to report that his own confidence was severely tried as he witnessed even the most basic rules of Tzotzil sound-change violated not 20 percent of the time, not 40 percent, but 60 percent!

On this note of disorder ended my second stage of lexicography. The caterpillars continued to wriggle on their pins in the most alarming way. Even so I looked forward to the final presentation of my collection, secure that despite its inconsistencies it was a considerable achievement.

### THIRD STAGE—PRESENTATION

The final stage was inaugurated by a game of jotto which I was induced to play on a computer terminal to prove to me that even I could face the new world bravely. It was the first step into the heart of darkness. A team of keypunchers trans-

ferred the information from the 25,000 typed vocabulary slips to a computer tape. I rented time on a computer terminal and hired an operator to make corrections. When the representative from the VIP Company stopped by to look at her work, he exclaimed, "That's all garbage!" In retrospect his reaction was not surprising, for in addition to the bizarre combination of letters was the insertion of percentage signs, commercial ats, knot signs, pound signs, a host of code letters that would eventually indicate such things as capitalization, italics, and boldface.

The decision to computerize the dictionary was based on the following grounds: (1) it would permit offset printing at a much lower cost than type-setting; (2) it would eliminate proofreading at the galley-proof stage and avoid the introduction of new errors by typesetters; (3) it would permit the creation of the English-Tzotzil section by automatic means; and, finally (4), it would store the data in a form that would be susceptible to manipulation by future scholars who could pull out whole classes of data for investigation. On the face of it, the grounds are logical and eminently sensible.

But it must be remembered that computers tolerate *no* errors. The "input" must be perfect. My terminal operator did her best. It was not good enough. Every space in the 80-character line had to be properly filled. If a correction involved a change in spacing, then not only that line, but every succeeding line of that entry had to be changed by a complicated procedure that was itself subject to human error. Endless proofreading always revealed new errors that had been overlooked. Once this material was transferred to tape at considerable expense, we were left with the botanical data that was still awaiting final determinations. A quick glance at the plant entries hardly suggests their complexity now that they have been stripped of all the code characters—characters which demanded that the keypuncher shift constantly from upper to lower case and back again. Tzotzil, English, Latin, abbreviations of botanical authors, specimen numbers, informant numbers—so much gibberish. By misspunching the line number, the line would be inserted at the wrong end of the dictionary. One 80-character line of input with its number tells the story eloquently as shown in the box below. Neither professional keypunchers, Harvard amateurs, nor I were sufficient to the task. My most experienced keypuncher, forced to seek confirmation of his insanity to escape the draft, worked with phenomenal speed and accuracy while thoroughly stoned. But even he could take only so many months of gibberish. Each successive keypuncher compounded the errors as she made corrections. One finally rebelled, calling it "shitwork," berated my programmer for involving her in such "immoral, antihuman" activity. I learned then how right she was. Zeno's principle of infinite progression seemed truer and truer as I proofread on planes, boats, beds, in buses,

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