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MISCELLANEA: (1) REPORT ON LINGUISTIC
RESEARCH AT YALE 1937-8.

(2) EXPERIMENT IN LINGUISTIC ABSTRACTION
AND / OR ASSIMILATION (RELATED TO MEANING
OF AZTEC ROOTS).

(3) STUDY OF LEARNING-INHIBITIONS AND
THEIR PREVENTION AND TREATMENT.

[MISCELLANEA]

by

Benjamin Lee Whorf

- A. Report on Linguistic Research in the Department of Anthropology of Yale University for the Term September 1937 - June 1938 (incomplete).
- B. Experiment in Linguistic Abstraction and/or Assimilation.
- C. Educational Project: Study of Learning-Inhibitions and Their Prevention and Treatment.

Note: Manuscripts found among Whorf family papers by J. B. Carroll.

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REPORT ON LINGUISTIC RESEARCH IN THE DEPARTMENT OF
ANTHROPOLOGY OF YALE UNIVERSITY FOR THE TERM SEPT. 1937 - JUNE 1938

By B. L. Whorf and G. L. Trager

PART I THE SYNCHRONIC OR NON-HISTORICAL ASPECT

SCHEMATIC OUTLINE OF PART I

Division A Configurative Linguistics By B. L. Whorf and G. L. Trager

1. Preliminary linguistic outline
2. Phonemics
3. Morphophonemics
4. Configurations of grammar including grammatical classes
5. Configurations of grammar as compared with experience interpreted non-linguistically

Division B Configurative Linguistics and Cultural World-Outlook -
"Ethnolinguistics" By B. L. Whorf

1. The configuration of experience as seen in language
 - I. Segmentation of experience
 - a. Segmentation in terms of grammatical classes
 - b. Segmentation in terms of one language compared with another
 - II. Implicit metaphysics of a language, and, more or less, of a culture
 - III. So-called primitive mentality - the concept of cultural mentalities
2. Interpretation of coordination and parallelism between language and culture (the non-historical aspect, historical aspect to be treated in Part II of Report)
 - a. General considerations
 - b. Illustrative detail
 - c. Simple versus complex terms
 - d. Cultural attitudes and backgrounds
 - e. Comparison of negativisms
3. Behavior-patterns as correlated with language
4. Study of the supra-linguistic and quasi-linguistic mentality

(collective or social) through the linguistic approach

- a. In general - spiritual emphases of a culture
- b. Kinds of translations - official, literal, and interpretative
- c. Understanding of symbolism
- d. Ideas not independently lexated
The concepts of lexation and independent lexation
Application to the grasping of subtle turns of meaning
in the languages of exotic cultures
- e. Correct recognition of the immaterial values of a culture

Trager's share in the present report is unavoidably very much curtailed by his absence in the European linguistic field. The compilation of the report was conceived and undertaken by the author, Whorf, not until the end of the second semester, long after Trager had sailed, and the author feels that it has not been possible for him to do justice by proxy to the large contributions made by his colleague. The important work in the subjects A2 and A3, the corner-stones of linguistics, is chiefly due to Trager. A1 and A5 represents mostly the work of Whorf; A4 represents mostly joint effort and collaboration. Division B represents the viewpoint of Whorf, who wishes to take full responsibility, but not full credit, for what is there expressed, for he acknowledges the contributions resulting from many discussions and consultations with Trager, particularly as relating to Trager's work with the Taos Indians. A number of suggestions and ideas have been contributed by Charles C. Hockett and Norman A. McQuown, students at the Yale Graduate School in the classes of the authors, others have resulted from correspondence and previous collaboration with Doctor Morris Swadesh, Mary Haas, and G. F. Voegelin. Five meetings for the reading of papers and discussion of linguistic work have been held jointly with Prof. Franz Boas and the group of linguistic workers associated with him at Columbia University, and we owe much to the stimulating points raised and ideas contributed by Prof. Boas and his co-workers, even where the fruits of those ideas may appear unrecognizable to them. We both acknowledge our great indebtedness to Prof. Sapir, especially for encouragement and for the stimulation given by his broad and penetrative outlook, at once scientific and sensitive, all of which he has given freely to us even while weighed down by illness. We unite in heartily wishing him a speedy return to health.

An expanded outline form has been used for the report, which follows. The nature of the research has been that of a work of systematization and of recognition of significances, and its conclusions are largely expressed in the arrangement and statements of the whole body of the report.

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Division A Configurative Linguistics

By B. L. Whorf and G. L. Trager

(Abbreviations: lge - language, lgs - languages, Eng - English)

1. Preliminary linguistic outline

As supplement to the extensive ethnographic outline prepared and published by the Dept. of Anthropology in 1937-1938, a tentative outline of the field of configurative linguistics as applied to any one language was made early in the term, and was entitled Language - Plan and Conception of Arrangement - as the name implies, a first and exploratory plan for the arrangement of linguistic information. It was not published in the ethnographic outline, but 5 or 6 typed carbon copies were distributed to persons interested, and a very condensed synopsis published in the ethnographic outline. It served somewhat as a basis for the further research, and work during the year has suggested much enlargement, some revision. The idea of such an outline is an important one for linguistic taxonomy, or the systematic view and classification of all known "linguistic species", i.e. individual lgs in order that science may obtain a comprehensive view of the human linguistic faculty as one large whole, much as zoology classifies and studies all animal species, not merely a few preferred ones. Long in advance of the ultimate possibility of such a linguistic world-picture it is desirable to compare many adequately comprehensive outlines and "trait-lists" of individual lgs to "see what we have got" world-wide and so make valid generalizations about the totality Language.

2. Phonemics.

a. Distinction of phoneme vs. allophone (positional variant). The allophonic constellations, or groups of sounds which actualize or represent each phoneme or sound-type under definite sets of conditions statable as formulae, have been worked out for Taos, Picuris, Hopi, modern Aztec (2 dialects), 2 or 3 dialects of American Eng. A certain basic system of allophonic constellations, as well as of phonemes, is characteristic of each language, and certain variations upon this basic system characterize each dialect of a language.

b. Correlative phonemes, or correlative phoneme-sets, e.g. (p,t,k), (p^c,t^c,k^c), (b, d, g). Features of correlation, e.g. voicing, aspiration, desonancy (the opposite of voicing, e.g. M, N, ŋ), off-glides, (e.g. off-glide i in ai, ei, oi as diphthongal unit phonemes), on-glides, nasalization, etc. have been studied. It is important, and often difficult, in a newly studied lge, to distinguish between a correlative feature, e.g. aspiration, i-glide, and a phoneme, e.g. h, ʃ. A certain correlative feature and a certain phoneme may have exactly the same sound and be the same thing on the physical or mechanistic level. They are different purely and simply as elements of Gestalt-wholes; this makes them immensely different perceptively to the native hearer but indistinguishable to the ear of the student until he has become adjusted to the phonemic system of the language. They can be distinguished only by configurative phonemic analysis, which is

obligatory and cannot be replaced by nicety of ear or acoustic instruments (not a new conclusion but worth re-emphasizing). The denoting of affricates by such symbols as ts, te, ~~ts~~ offends against this principle because it denotes a feature of correlation by the symbol for a phoneme (t), and this soon leads to practical difficulties. Correlative features between allophonic constellations also exist (e.g. one particular positional variant of l may have a phonetic feature correlative with the corresponding or "homopositional" variant of m, although l and m as phonemes do not correlate). Of this type are cluster-glides, which sound like vowels, and are often lumped with certain vowels under the loose term "shwa". Such glides appear in e.g. pris^m, rhyt^m, litt^{le}, and are more widely distributed in colloquial dialects, e.g. ath^{letic}, el^m; their irregularity of distribution in "standard" Eng may enable them to be considered as vowels (?), but Hopi -kⁿ-, -k^l-, -tⁿ-, etc. are definitely allophonic correlatives (cluster-glides).

c. Distinction of segmental phonemes (consonants, vowels) and prosodic phonemes, i.e. units of length, stress, accent (pitch-stress, pitch), clipping. Clipping or prosodic staccato (Trubetzkoy's "Silbenschnitt") was discovered in and worked out for Hopi; it occurs in Eng and German.

3. Morphophonemics

Morphophonemics is a configurative analysis which distinguishes phonetic configurative elements (called usually morphophonemes) characterized by homologous position in linguistic elements of constant meaning - a type of configuration not used in pure phonemics. Thus if threads connected all the c's, l's, i's, f's in cliff, cliffs, cliffy, the same morphophoneme would be found repeated along each thread. The same would be true of leaf, leaves, leafy, for this type of analysis considers the v in one word morphophonemically equivalent to the f's in the other two, because it lies on the same thread with them. Morphophonemics relates to the underlying model of a set of forms - when lexical this model is that linguistic entity which has traditionally received the name of "root". We recommend that this very convenient name be retained, but also that the understanding of it be less loose, and clarified by the morphophonemic concept. The symbol $\sqrt{\quad}$ is suggested not only for roots but to indicate morphophonemic symbolism in general. The roots of the "cliff" and "leaf" forms above, might be denoted $\sqrt{\text{klif}}$, $\sqrt{\text{lif}}$. All phonologic variation in a given lge may be divided into allophonic (coming under phonemics) and morphophonemic. The latter includes ablaut, sandhi, lenition, hardening, zeroing, e.g. Eng moisten (moism) : $\sqrt{\text{moist}}$, Latin nox : $\sqrt{\text{noct}}$, cf. noctis, and various other types of phonologic phenomena. It is very important not to confuse morphophonemics with historical reconstruction. The (morphophonemic) root $\sqrt{\text{klif}}$ is purely a formula that correlates synchronic linguistic facts, and has nothing to do with the historical prototype (for which we use the customary marking * instead of $\sqrt{\quad}$) of the set of forms in question. Trager has worked out the complicated and unusual consonantal changes (consonantal ablaut) in Tacos verbs, where the "vocal segments" of Hopi vowels treated as morphophonemes.

4. Configurations of grammar including grammatical classes

a. Overt and covert classes Grammatical categories are

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distinguished by grammatical markers, which may or may not appear with the form categorized. The test unit is the sentence, or sometimes small group of sentences (immediate field of discourse), not the word. For the marker to appear "with" the form means to appear in the same sentence (or sometimes, in the immediate field of discourse); e.g. in 'he saw a small fish', 'a' marks "fish" as of the category or class 'singular number', and appears "with" it. Grammatical classes which appear ordinarily "without" markers do have markers appearing with them under certain particular circumstances - such a class is "covert", and its marker a "reactance". Its grammatical meaning, if distinguishable, is a "cryptotype". Grammatical classes are not to be set up in the absence of any markers at all; from a grammatical configurative standpoint an entirely unmarked class would be a fiction. Such fictitious categories have frequently been foisted upon exotic languages and modeled upon meanings of marked categories in the investigator's or grammarian's native European language. At the same time genuine categories of the exotic language have been ignored because they were marked only covertly. Covert marking is very definitely marking, and cannot be ignored. ~~xxxx~~ Markers include of course features of position and order in the sentence, and negative features - the significant absences of forms or patterns otherwise to be expected. Covert categories are accompanied by markers in all or nearly all sentences - e.g. verbs and nouns in Eng and French, gender in French. Their grammatical meanings are "phenotypes". Covert categories have markers that ordinarily do not appear - they appear only in certain "test" types of sentence; e.g. Eng genders, where the markers (reactances) are the personal pronouns, but appear only when the sentence calls for such a pronoun. The pronouns mark linguistic classes, not "natural" orders of experience that could be discriminated by non-linguistic tests - this, in spite of the considerable degree of alignment with a sex distinction is true of Eng as well as of French, Latin, Hebrew, or Taoist gender. Eng verbs belong to different covert classes of "resolution" marked by absence of nouns or pronouns after the verb and other patterns ('I heard it') but not ('I listened it') and ('it was heard') but not ('it was listened') etc., but in many types of sentence ('I will hear', 'I will listen' etc.) no markers appear. Covert classes have failed of sufficient recognition both in European and in American Indian lgs; they are often of the greatest importance, and failure to recognize them may baffle or delude the investigator of a lge. The covert classes may have a far-reaching connection with the type of thinking, the "philosophy" or "implicit metaphysics" of a lge (cf. the important "round", "long", etc. covert classes of objects, i.e. of nouns, in Navaho, reactance ~~apparent~~ in form of certain verbs) and go to make up the number of those things that are responsible for the impression of a ~~primitive~~ "primitive mentality" different from "civilized mentality" (see Bl, III). The manifestations of these class-distinctions in thinking and the character of the sometimes rather deeply-hidden and seldom-appearing reactances suggest the phenomena associated with the unconscious, subconscious, or foreconscious in psychology, though on a more socialized and less purely personal plane, and may connect in a significant manner therewith.

b. Selective and modulus classes. Observing now a different order of configuration, classes may be divided into two types through the type of applicability of their markers, according as they apply only to a selected group of the vocabulary (selective class) or to the

whole vocabulary or the whole of a certain larger class, which may be selective (modulus class). Typical of selective classes are the "parts of speech", nouns, verbs, etc., of modulus classes or moduli are case, number (applicable e.g. to all nouns), voice, aspect, tense (applicable e.g. to all verbs). In some lgs and lge families, e.g. Semitic, Wakashan, moduli take the place of "parts of speech"; this has not been sufficiently recognized. Eng is moving in the same direction, has indeed gone a long way towards such a condition. Esperanto has moved in the opposite direction; it was designed to have only modulus classes and roots, but selective classes of roots have appeared in actual usage, as Mr. Mequown has shown, modeled on similar classes in European lgs. Moduli are overt, selective classes either overt or covert. The markers of moduli are called by us "signatures". One modulus (e.g. Eng noun-plural) may have more than one signature, e.g. for Eng noun-plural, -s, vowel change, -en, absence of article, plural verb, suppletion (e.g. chicken : poultry). Signatures may be "bound" (a part of the word, including internally) or "free" (appearing separately in same sentence (including features of order and negativisms). "Inflection" is a term covering all bound markers, both signatures and selective markers. "Attached" is suggested as a broader variety of the type of "bound", including markers attached to any word and not necessarily to the word categorized - e.g. in S. Paiute there are such markers that may be attached simply to any word that begins the sentence - these are usually not called "inflections" but "enclitics".

5. Configurations of grammar as compared with experience interpreted non-linguistically

The task of formal grammar ends when the analysis of all linguistic configurations is completed, but the characteristics of a language are by no means fully accounted for then. It remains to indicate the types of experience and kinds of referents referred to by different grammatical classes, for lgs may here differ widely. Our ordinary ways of classifying referents, as being "things", "objects", "actions", "states", etc. are quite unsuitable for this work, as they are themselves names for partitionings of experience resulting after it has been grammatically classed, and circular definitions or mere confusion will result from applying them as if they referred to the conformation of reality itself. Terms like "subject", "predicate", "actor", "agent", "function", "cause", "result", are equally misleading or useless xxx in any other than a strictly grammatical sense, defined for and by each particular lge and referring only to the patterns therein and not to external reality. It is, e.g. quite legitimate to talk about "the agent" in a given lge where the term has been defined or illustrated, but it is not to say that two different lgs of widely different type are alike in their treatment of "the agent". In such a use it is not clear what "agent" means. It is impossible to break up the flow of events in a non-arbitrary manner into "subject", "actor", "predicate", etc. as if there existed external realities of this sort. We, to be sure, may analyze a phenomenon as 'boy runs', but another lge is capable of analyzing it 'run manifests as boy'. In describing differences between lgs in such respects we must have a way of describing phenomena by non-linguistic standards, and by terms that refer to experience as it must be to all human beings, irrespective of their languages or philosophies.

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This is possible, the way having been shown by Gestalt psychology. Visual perception is the standard, norm, and framework of all experience. The forms and laws of visual perceptions are the same for all individuals - even the most glaring abnormalities, like color-blindness, are relatively minor, and do not disturb the universal configurative principles of visual perception. We need not cite these laws here - see, e.g. Kurt Koffka, "Gestalt Psychology". The basic principle is the contrast of figure and ground, involving the differing degrees of organization, stability, and fixity in figures or outlines of all sorts. A non-linguistic canon for describing the referents of linguistic forms, a canon which is understood in the same way by the speakers of any and all tongues, is provided by considering whether the referent has an outline or has not, and next, how much of an outline, a definite or a vague outline, a fluctuating or a stable outline, a quality of ground or field as more important than outline, and similar criteria which can and should be worked out and expressed in suitable terminology. The difference between the referents of the words (a) dog, chair, house, tree, and (b) run, stand, fall, smooth, stiff, etc. is not to be phrased as that (a) are things, and (b) actions or states; but as (a) with marked outlines, or outline as of primary importance, and (b) with outline-quality subordinate or lacking. Going further, and comparing (c) stand, sit, lie, fall, with each other and with (d) white, smooth, large, useful, we see that the (c) words also refer to experiences with a degree of outline, though a very low degree, while the (d) words refer to experiences in which the quality of outline is lacking. Certain covert shape-classes of nouns in Navaho and other lgs seem to have a class meaning referring to generalized outlines like the (c) words. The lge which says 'run manifests as boy' has the characteristic of commonly expressing "first degree outlines" (e.g. boy) as "verbations". In Eng, ~~and~~ an experience of "liquid H₂O" must have a certain minimum of outline-quality before it is in common parlance referred to by the noun 'water' - lacking this it is treated as ground or field, and referred to by adjectives - 'wet', 'damp', 'moist'. Hopi treats "liquid H₂O" rather differently - ~~and~~ see Bl1b below. Some lgs have highly figural (i.e. "outlinish") verbs, e.g. 'to be a hole in the ice' (Potawatami), 'to manifest as a fascioled buneh' (an outline like a bouquet of flowers) (Hopi). Hopi is indeed rich in highly figural verbs, with no counterpart in Eng. If the experience is also momentary or fluctuating it must be a verb reference, no matter how outlinish, unlike Eng; hence our nouns 'wave', 'flash', 'blow' (striking), ~~and~~ 'splash', 'lightning', 'meteor' cannot be translated by nouns in Hopi, but the same ~~experiences~~ experiences are there denoted by verbs. This pattern even prohibits the reifying or "nounizing" of such momentarily outlined experiences by roundabout linguistic devices such as participles: 'shooting star' is ruled out in favor of 'star moves', 'sunset' in favor of 'sun sets' (literally, 'sun interiorizes'), 'running dog' is permissible only when used like a dependent relative clause, and 'it is a running dog' is ruled out in favor of 'a dog runs'.

Division B Configurative Linguistics and Cultural World-Outlook

By B. L. Whorf

The term "Ethnolinguistics" is suggested for this type of study

1. The configuration of experience as seen in language

I Segmentation of experience The flux of experience may be classified and "chopped up" differently by different languages; this is most readily seen by going outside of Indo-European, American Indian lgs providing some of the greatest contrasts. These differences in "segmentation" - in what is treated as "one" aspect, phenomenon, substance, or quasi-whole, isolated out of the mass of presentation and fitted together with other such segmentation to make the mosaic representation of life which the language and culture takes for granted - these differences may apply not only in the large outlines of the cosmic picture (Bl. II), where they are at their most subtle and hard to appreciate, but also in countless small matters of detail, where they are much more easily seen.

We say "a box of cigars", Hopi says "cigars plurally put inside", where 'plurally put inside' is a unitary term, unanalyzeable except for inflectional endings. The two expressions refer to the same bit of experience but segment it into different constituents. Eng presents an outlined bit of the world, a 'box' - it carries the implication of contents, which the relater 'of' discloses to be cigars. In Hopi the cigars are the main idea, to which is referred a generalized configuration of interiorized multiplicity, but whether the enclosure that preserves this configuration be a box, barrel, bag, package, etc. does not require mention. We "unbutton" a coat, Hopi "causes inner-plural separation" of it (unit term 'separate' with inner-plural and causative inflections) without any allusion to such bits of experience as buttons. Where we have one term 'snow', another lge has different words for snow everywhere on the ground, snow in patches, falling snow, etc. Words translated 'war', 'clan' etc. may carry a complex institutional meaning like our 'the Church', 'the theatre', 'the stage', or again they may be rather on the plane of our fr 'a church service', 'a play', 'a fight'.

a. Segmentation in terms of grammatical classes Study in this field springs naturally out of A4 and A5. For what sort of segmentations of experience does the lge use its various parts of speech, its cases, numbers, aspects, voices, etc.? See A5 for ways of allocating types of experience to verbs or to nouns, contrasting Eng and Hopi. Eng uses nouns for 'summer', 'winter', 'morning' etc.; in Hopi these segmentations of experience are neither nouns nor verbs, according to the formal configuration of the Hopi noun and verb classes, but a class by themselves, a type of adverb (= when it is summer, when it is morning). The ideas of 'waiting', 'remembering', 'inferring' may be expressed in Hopi by adverbs; in Eng they require verbs. In Hopi "referential motion" or motion described simply by reference points and directions is not denoted by formal verbs - i.e. there are no verbs 'go' and 'come'. It is expressed by formally verbless sentences containing the necessary directional data as cases, postpositions, or adverbs. Then, in the

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absence of formal verbs, a special inflection at the end of the last word in the sentence adds "verbatation", or the characteristic of verbs which is necessary to complete sentences. Thus 'he goes to the tree' is 'he to the tree (with verbatation)' or 'to the tree he(with verbatation)'. But 'he runs to the tree' requires a formal verb to express running. The adverb pay 'now, then' properly 'in process of manifesting for the moment', or 'transiting through a small segment of existence' when thus used with verbless verbatation means 'go' in the sense 'leave, depart', i.e. not go anywhere or in any direction in ~~particular~~ particular, but simply go out of the immediate scene. The ~~xxxx~~ provinces of a certain grammatical class in one language may be a mere unexpressed nuance in another, in a third it may be a nuance expressed entirely by prosodic features, stress, loudness-emphasis, intonation, etc. In Hopi definite words express what special stresses and intonations express in Eng, e.g. kar ga' pve'ltotig 'if they are not quieted', kar ga' pas pve'ltotig 'if they are not quieted', where the adverb pas corresponds to the Eng nuance given by special stress on 'not'. Some languages have no special type of intonations for questions, interrogation being expressed only by a morpheme, sometimes an independent word.

b Segmentation in terms of one language as compared with another

Most generally the two lgs so compared will be an exotic lge being investigated and the investigator's native tongue, e.g. Eng, French, German, Spanish, etc. Modern European lgs are enough alike to ~~xxxxix~~ constitute a "standard average European" (SAE) for comparison with e.g. an Am. Ind. lge. A very simple case of segmenting a perience differently is treatment of the human body and its division into named parts. Even within SAE are distinct differences: 'finger' and 'toe' have the same name in most Romance lgs, Eng uses 'toe' for both 'foot-digit' and 'point of foot', Polish has one word for 'hand-arm region' and similarly 'foot-leg'. Hopi differs somewhat from SAE - a general hand-arm region, but foot and leg distinguished, no simple terms for hand, nipple, nostril, anus, vagina, buttock, cheek, which are expressed synthetically as the heads, holes, or mounds of certain regions, on the other hand simple terms for fold of groin, top of head, and lower back above buttocks, our 'back' being segmented as two regions instead of one. Verbs and words for general ideas may be related to the body-part analysis and vary accordingly. The Hopi verb ii'ta refers to motion of entire hand-arm region with an external object included, hence is the translation of lift, pass, hand over an object already in the hand, but is not used when the action must begin with a grasping or picking up of the object.

The world of natural phenomena and substances may be variously segmented - see instances above of 'snow' and Eng (and SAE) 'water'. Hopi segments liquid aqueous manifestation into pa'ha 'wild water' and ka'vi 'fixed water' (water within a small fairly stable outline, as that of a container); it is the first that runs from taps and faucets and is in springs and rivers, the second which is in a glass or vessel or spilled therefrom on floor, etc. The second is the most general response on being asked the word for 'water', while the other is apt to be the reaction to 'pond' and is always so to 'spring'. There is nothing quite corresponding to Eng 'wet' - while 'be dry' is a formal

EXPERIMENT IN LINGUISTIC ABSTRACTION AND/OR ASSIMILATION

This experiment has been conceived in conjunction with a study of the idea-relations which are the common property of the individuals speaking a certain language and communicable from one individual to another by means of the certain norm of meaning attaching to each word. Therefore it differs from what are perhaps the more typical experimental studies of abstraction, in which the presentations given to the subjects are composed simply of sensations without ostensible meaning, and the subjects are desired to abstract from the percepts thus received. On the contrary the intent is to present the subjects not with percepts but with ready-formed concepts or at least general meanings, and to associate with these certain percepts; namely combinations of letters which contain a common element. The essence of the investigation rests in the fact that the combinations of letters are not to be nonsense-syllables picked at random but are to be related, each to a certain concept or meaning simultaneously presented, through the medium of some one language, of which language however the subjects are ignorant. They also may at the option of the experimenter be kept ignorant of the fact that any actual language is involved, being allowed to form their own opinions of the nature of the connection between the presented ideas and the letter-arrangements.

The language used is preferably to be one in which there is a close correspondence between ideational elements into which the meaning may be analyzed and parallel formal elements into which the word may be analyzed, the grammatical part of the word especially being clearly distinguishable from the naming part. ~~ix~~ Such languages are ~~ix~~ often called "agglutinative". In some languages though not so much in Indo-European there is a rather close and regular rapport between sound and sense. Again, E. Sapir has shown in his paper on "Sound Patterns in Language" that the sounds of a language are thought of by its speakers not in isolation but as points in a pattern. The language chosen for this experiment is Aztec, as the writer had done a certain amount of linguistic study on it. The meanings of the words are translated from the Latin given in the Aztec-Latin glossary of the "Evangelium Aztecum" of Fr. Hernando Sahagun. The spelling of the Aztec words has been slightly changed from the traditional method based on old Spanish, in order to make it perfectly regular with one letter standing for the same sound. Aztec by the way is a living tongue, though it has received hardly any grammatical or lexicographical treatment within modern times.

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The particular experiment may be described thus; supposing that there be asked the question, "what is the meaning of the syllable ZE" (pronounced zay) which is common to the list of words presented, let us study the mental processes which such a question arouses and compare the results obtained.

It is optional with the experimenter whether he shall ask the subjects the above question or see if they propound it to themselves in reacting to the list. There is no right or wrong answer to this question based on linguistic studies, since no attempt has been made to analyze this language minutely as has been done with the Indo-European tongues.

One object of the experiment would be to see if the subjects abstract a common element from the various ideas, ~~xxxxxxx~~ this common element being mentally associated with the common phonetic element ZE. This manner of stating the case rather posits a close analogy between a presented idea, like "prepare" and a perceived situation, the idea likewise being thought of as a complex thing resolvable into various elements, some of which it is presumed the subject may abstract from the rest. The process might however prove to be describable as an assimilation of the presented ideas to a certain concept which the subject comes to equate to the constant percept ZE. If so, what are the cues to this concept, and do the subjects using this assimilation method arrive at ~~smx~~ similar results for the "meaning" of ZE; if so, how?

The question "what is the meaning of ZE" may of course bring in logic, but the logical element, especially that which would require further data to work upon, has been reduced to the minimum by excluding compound words from the list, for instance the several compounds in which ZEM "together" is prefixed to some verb. In such compounds the meaning would vary very greatly according to the meaning of the other word in the compound, and to arrive at a fair opinion about ZE it would be necessary to be told the meaning of this other word and then start a logical inductive process. Furthermore, to eliminate attempts at logical derivation that otherwise might be made, an Aztec word which consists of the syllable ZE alone has been ~~xxxxix~~ omitted from the list. The various phonetic forms attached to the ZE, such as A, C? M, N, TL, IA, LI, UA, etc. are Aztec derivational suffixes used in forming noun-stems, verb-stems, adjectives, adverbs, but beyond this functional utility they would seem to have no particular meaning. Nevertheless logic is not to be excluded from the possible methods of attacking the problem, and it is desirable to know what use is made of logical approaches, of classificatory abstraction, of peculiar aesthetic reactions, and so on.

The technique of the experiment is left to the experimenter. It might be borne in mind that the following are all possible and legitimate answers to the question: (1) ZE has a single meaning throughout, variously modified and developed in the different words. (2) There are two, three or more ZE's, with distinct and quite unconnected meanings, each appearing in a group of words. (3) There are two, three or more ZE's with different but connected meanings springing from one fundamental notion. (4) ZE has no connection with the meanings; or, ZE is meaningless.

ZEA	Be willing, consent, assent.
ZEALIZ	Will, volition.
ZECI	Some one, any one, one, another, the other.
ZEL	Alone, only.
ZELIA	Receive, take.
ZELIC	Recent, fresh, green.
ZELICA	Newly, freshly.
ZEMANA	Continue, persevere, be permanent, last.
ZEMANI	Simple.
ZEMELTIA	Refresh, delight.
ZEMICAC	Always, forever.
ZEN	Together, simultaneously, at once, wholly, altogether.
ZENCA	Greatly, much.
ZENCAVA	Prepare, finish, ornament, instruct.
ZENCAULIA	Prepare, arrange, dispose.
ZENCIZA	Come together, congregate.
ZENCIZCI	Perfect.
ZENCIZTICA	Whole, sound.
ZENCOL	Everywhere.
ZETL	Ice.
ZEUA	Grow cold.
ZEUALLI	Shade, shadow.
ZEUALLOTIA	Overshadow, shade.
ZEUALWIA	Darken, shade.
ZEUI	Reconcile, conciliate.
ZEUIA	(1) Become quiet. (2) Pick up, take up, lift, resume, do again. (3) Make cold.
ZEUILIZ	Peace, quiet.
ZEZEC	Cold.
ZEZELIA	Zezen (1) Become unburdened, lightened; relax oneself (2) Make cold.
ZEZELIC	Cold.
ZEZELTIA	Refresh, delight.
ZEZELTIC	Fresh, green, delicate.
ZEZEULIA	Placate, assuage, mitigate.
ZEZEYA	Grow cold, feel cold.
ZEZEYOTL	Tallow, hard grease.

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EDUCATIONAL PROJECT

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3.

STUDY OF LEARNING-INHIBITIONS AND THEIR PREVENTION
AND TREATMENT

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With special reference to inhibitions in the learning of languages and in branches of study where the handling of language or linguistic patterns, whether native or foreign to the user, is of crucial importance; and looking toward the development of effective psycholinguistic or linguistic-psychological techniques for attacking the problems of education in these fields.

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A great many promising students when they begin high school or college studies find after a while that they have acquired an inhibition to the learning of some subject or certain subjects. The inhibition often takes the form of a persistent belief that the particular person cannot learn the subject, could never, no matter how hard he tried, acquire any facility in it; that he is indeed born without the necessary magic aptitude without which the subject will not, so to say, adhere to the learner, - without which no person can be "any good" in that subject. Sometimes it shows up as a feeling that the teaching is hopelessly bad or that the teacher is prejudiced against the pupil and is not making any proper sort of attempt to understand and clear up his difficulties. Sometimes it is just a feeling that the subject is unutterably tedious or bafflingly complicated; sometimes the pupil attempts flight by way of unruliness or the like; but whatever the form that the inhibition may take, the pupil is overcome by a feeling of hopelessness and impotence. A paralysis seems to come upon the pupil's learning powers so far as that subject is concerned, though he may be brilliant in others, and he sinks into a dull rut of mechanical question-answering and finally abandons the subject. The inhibition to the subject and the feeling of inability to make headway in it usually persist through life.

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In the United States at least a large percentage of these inhibitions seem to pertain to the learning of foreign languages, and another large percent to linguistic matters connected with English, such as acquiring facility in manipulating the powers of the language freely in talking or writing (English Composition), difficulty with the concepts of grammar, various "literary" subjects, and subjects such as history where much may depend on the pupil's ability to recount convincingly what he has learned in his own words. One often hears such expressions as "Oh, yes, I studied French for a while, but I've always been a duffer at languages - never could seem to get my tongue around foreign words - I guess you just have to be born with a linguistic knack". Or - "I never could get it through my head what grammar was all about - I wish I wasn't always making mistakes in grammar and using bad English" - and so forth. Even out of the strict language field a large number, though not necessarily all, of such frustrations, seem to bring in linguistic factors. This is not to minimize the importance of other factors; we might bear in mind that there is a complex of influences entering into social adjustments; but the fact that language occupies a

fundamental position in practically all teaching and learning processes, and the fact that difficulties and inhibitions tend to cluster especially around the learning of language techniques, point to linguistic factors as though to one prime source of difficulty. It would seem that the attempt to teach a pupil a new language (and in a broad sense the literary dialect and the erudite formations of his own language may be considered a new language in relation to his colloquial speech at the childhood and adolescent level) suffers from the inherent difficulty that the new language can be communicated to the pupil at first only by using the patterns of the language that he already knows, though these patterns entirely misrepresent those of the new language. Unless the teaching pays due regard to the difficulties of the transition, and uses the forms of the old language with continual discretion, and as a bridge to the forms of the new, there is much danger of arousing the sense of hopelessness and starting an inhibition such that the bridge is never really crossed. As yet we know almost nothing of what this "due regard" should consist of, nor do we possess the trick of this "discretion" whereby the learner may be brought over the bridge of ~~subtle~~ subtle linguistic transitions without arousing an inhibiting fear; but it is safe to say that the technique would have to be a psycho-linguistic one, and that present-day linguistic and psycho-linguistic research is ready to begin the inquiry, and if determinedly applied could not fail to throw a flood of light on learning-inhibitions and how to overcome them.

After linguistic subjects, mathematics is perhaps the subject on which the most people include themselves in the ranks of dufferdom. But here the case is often due not so much to an inhibition as to the fact that a continuously progressing symbolism is involved, in which the learner has never gone beyond the early stages. And yet there are plenty of inhibitions to the learning of mathematics to be found, many of them acquired in the ~~earliest~~ earliest stage, that of simple arithmetic. Here we have a problem similar to the one already noted, the problem of teaching a new language of symbolism when the only channels for communicating it to the pupil are those already channeled by the pupil's colloquial language. ~~Some~~ A certain person who has an inhibition in arithmetic feels that a good deal of it is due to feeling obliged to repeat a certain word-formula, like "five times five is twenty-five" in order to perform the simplest mathematical operation. If he wishes to multiply two figures of several digits he has to say to himself a long succession of such word-formulas, at the same time that he is figuring on paper. This retards the speed of his figuring and makes the process seem slow and laborious. He feels that if he had been definitely taught to drop this form derived from his infantile pre-mathematical language, and had been shown how it was only a stepping stone to the symbolic operations of the new language of mathematics, he would not have become the slow mumbling sort of calculator that he is, but would have learned to calculate rapidly and confidently.

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Concrete Approach

It is proposed that the project in at least its first phase (the only one treated herein) be restricted to work with language subjects. The work would look toward the better understanding and removal of difficulties in the acquirement of foreign languages and foreign linguistic features, such as unfamiliar sounds and unfamiliar grammatical concepts or word arrangements. It is recommended that the study include the ~~following~~ following lines of approach besides others which may ramify out of these in the course of actual work, or which will undoubtedly be suggested to the worker as he comes to grips with his material.

1. People of various ages who already have inhibitions to the learning of languages should be taken as subjects of individual clinical study. The patterns underlying the inhibition can probably be found in many cases by an analytic method employing questioning, reminiscence, free association, discussion, and personal teaching, much like psycho-analysis but without using the concepts or terminology of psycho-analysis. Instead, the concepts of linguistics and linguistic psychology would underly the technique. In other words, this analytic technique would attempt to study, through personal contact with individual "cases", the mechanisms of adjustment from a more primitive personally-centered phase of language to a later-acquired, more sophisticated and more widely social phase of language, just as psycho-analysis studies the mechanisms of adjustment from more primitive to more socially-patterned forms of the sexual and erotic principle. (It might be added that the rigid patterning of linguistic symbolism provides means for scientific testing and positive confirmations such as do not exist in the wild maze of sexual symbolism.) The success of the method would be indicated by the "cure" of the case - that is, by the subject's successful attainment of moderate proficiency in a foreign language, coupled with removal of the inhibition so that he felt able to continue the language study, if he cared to do so, without undue effort.

(Footnote: It is not implied that such "cure" will come from any "catharsis" brought about in the patient by the analysis, but only that the teacher-investigator will have been able to convoy the subject's interest ~~through~~ through the critical transition zone ~~by~~ and to substitute the right patterns of transition for the wrong ones which have hitherto hampered him.)

2. Boys of high-school freshman age have a natural interest in linguistic phenomena if they are related to their play activities rather than to the conventional sort of school work. A method of giving boys a linguistic foundation that will later make languages "come easy" to them and give them a distinct superiority of equipment in linguistic powers throughout life can be based upon this fact. For girls a somewhat different sort of play approach may be needed, but for boys the following two lines should be worked upon in close conjunction:

a. Boys at this age often pride themselves on an ability to make queer noises of a speech-sound character. They sometimes invent their own forms of comic or mocking speech, with "off-color" phonemes. Sometimes speech-sounds quite foreign to English will be used and show a stability like that of phonemes; in fact the boy will be using a phonemic system of his own. Boys have been heard to use in this way a spirantal voiceless r, the affricate tg, t in the tg-position, interdental t and n, nasal vowels, etc.

It should be possible to familiarize boys with a great deal ~~in the field~~ of phonetics and speech-sound patterning by beginning on what from the boyhood standpoint are attractively weird and unearthly noises. By opening up the possibilities of the ~~discovery~~ perennial invention and discovery of extraordinary vocal sounds, a trained linguist who understood boys could lead them deeper and deeper into real linguistic ~~in~~ facility. They learn how to produce the speech sounds of Indians, Eskimos, Zulus, "natives" of every sort, and from there they ~~go~~ go to more subtle matters like differences of vowel-length, stress, and tone. With this linguistic background and the one indicated below they begin the study of actual foreign languages.

b. Boys of early high-school age like to make up "secret languages" and codes both written and spoken, either for their private use, or shared between close chums, or to use in their clubs, gangs, and "secret societies". Most of such languages are of course simply distortions of English of the "pig-latin" type, or spelling codes with new letter-names, but sometimes there will be found the crude beginnings of a true artificial language with its own stock of words. Boys frequently invent ~~invented~~ words like "nitzy", "wacky", "beenanah", "bushwa", "agroc" - to cite a few the writer has heard.

It would be possible to lead boys into a rather broad acquaintance with grammatical and linguistic forms and possibilities, not through the medium of any actual language, but through artificial languages that explore these possibilities in a simple and direct manner. A trained linguist familiar with a wide diversity of actual languages should be the teacher and stimulator of ideas. The boys would be shown how to make their own secret languages in a way superior to the crude pig-latin forms, by inventing their own roots, stems, suffixes, prefixes, and other operators, and by developing the possibilities of combinations of these elements. At first the patterns used would closely follow those of English. The vocabulary would be different, and the possibility of talking with other words than the English ones, an attractive possibility to the average boy, would be definitely ~~be~~ realized, to the extent where the boys would be prevented from developing such inhibiting notions as that it is somehow silly to call a horse a "cheval" when "it really is a horse", or that foreign languages sound like "blub-blub-glug-glug" or that one has to "think backwards" in them, etc. As the study went on the English patterns would be more and more departed from. The pupils would acquire ~~at~~ vivid concepts of paradigm, word-class,

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the verb and noun categories, the various sentence types, etc. through this linguistic experimentation. Perhaps in the latter part of the study each boy in the class would construct his own artificial language much as each student in a dramatic school writes his own play. There would also be a language of the whole class in which they would pool ideas, and in which they could talk. The work should not be carried far enough to become irksome, but rather enough to stimulate interest in what actual languages are like, and to lead into later study and learning of actual foreign languages.

3. Study of Constant Irrational Associations

Many people constantly associate various concepts learned in school, such as letters, numbers, written words, dates, etc. with other ideas and images having no rational or apparent connection. Sometimes these associations are helpful to learning-processes, sometimes harmful, sometimes indifferent. However, they could so readily become an impediment to a learning-process, or perhaps properly used an aid, that a study of their mechanisms is much needed. There are certain indications that these mechanisms may have a considerable linguistic basis.

One of the commonest of these associations is the feeling that letters and written words have colors. Sometimes also numbers are felt to be colored. One subject who conceives letters and written English words as colored after a somewhat systematic fashion, yields some indications that the manifestation is of linguistic origin; and ideas have been for a method of experimentation along this clue with colored cards and a color-blending wheel which it is felt might lead to some interesting results.

Although these color associations may not be detrimental to the learning process and may even be helpful to it, other similar associations may tend to confine thought in quite hampering grooves. A certain subject who has an inhibition in arithmetic thinks of the number series as lying along a line for the most part straight but having irregular bends at the numbers 12, 20, 30, 100, and 1000. He feels that if he had been led to think of the numbers as arranged in a spiral or on a line that made a more strategically placed set of bends, he might perhaps have found it easier to perceive numerical relations.

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