

M O T T E R

Translation and Meaning§ 7. FIRST STEPS OF RADICAL TRANSLATION¹

We have been reflecting in a general way on how surface irritations generate, through language, one's knowledge of the world. One is taught so to associate words with words and other stimulations that there emerges something recognizable as talk of things, and not to be distinguished from truth about the world. 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. In this chapter we shall consider how much of language can be made sense of in terms of its stimulus conditions, and what scope this leaves for empirically unconditioned variation in one's conceptual scheme.

A first uncritical way of picturing this scope for empirically unconditioned variation is as follows: two men could be just alike in all their dispositions to verbal behavior under all possible sensory stimulations, and yet the meanings or ideas expressed in their identically triggered and identically sounded utterances could diverge radically, for the two men, in a wide range of cases. To put the matter thus invites, however, the charge of meaninglessness: one may protest that a distinction of meaning unreflected in the totality of dispositions to verbal behavior is a distinction without a difference.

¹ An interim draft of Chapter II was published, with omissions, as "Meaning and translation." Half of that essay survives verbatim here, comprising a scattered third of this chapter.

§ 7

FIRST STEPS OF RADICAL TRANSLATION

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Sense can be made of the point by recasting it as follows: the infinite totality of sentences of any given speaker's language can be so permuted, or mapped onto itself, that (a) the totality of the speaker's dispositions to verbal behavior remains invariant, and yet (b) the mapping is no mere correlation of sentences with *equivalent* sentences, in any plausible sense of equivalence however loose. Sentences without number can diverge drastically from their respective correlates, yet the divergences can systematically so offset one another that the overall pattern of associations of sentences with one another and with non-verbal stimulation is preserved. The firmer the direct links of a sentence with non-verbal stimulation, of course, the less that sentence can diverge from its correlate under any such mapping.

The same point can be put less abstractly and more realistically by switching to translation. The thesis is then this: manuals for translating one language into another can be set up in divergent ways, all compatible with the totality of speech dispositions, yet incompatible with one another. In countless places they will diverge in giving, as their respective translations of a sentence of the one language, sentences of the other language which stand to each other in no plausible sort of equivalence however loose. The firmer the direct links of a sentence with non-verbal stimulation, of course, the less drastically its translations can diverge from one another from manual to manual. It is in this last form, as a principle of indeterminacy of translation, that I shall try to make the point plausible in the course of this chapter. But the chapter will run longer than it would if various of the concepts and considerations ancillary to this theme did not seem worthy of treatment also on their own account.

We are concerned here with language as the complex of present dispositions to verbal behavior, in which speakers of the same language have perforce come to resemble one another; not with the processes of acquisition, whose variations from individual to individual it is to the interests of communication to efface (cf. § 2). The sentence "That man shoots well", said while pointing to an unnamed man, has as present stimulation the glimpse of the marksman's familiar face. The contributory past stimulation includes past observations of the man's shooting, as well as remote episodes that trained the speaker in the use of the words. The past stimulation is thus commonly reckoned in part to the acquisition of language

and in part to the acquisition of collateral information; however, this subsidiary dichotomy can await some indication of what it is good for and what general clues there are for it in observable verbal behavior. (Cf. §§ 9, 12, 14.) Meanwhile what is before us is the going concern of verbal behavior and its currently observable correlations with stimulation. [Reckon a man's current language by his current dispositions to respond verbally to current stimulation, and you automatically refer all past stimulation to the learning phase.] Not but that even this way of drawing a boundary between language in acquisition and language in use has its fluctuations, inasmuch as we can consult our convenience in what bound we set to the length of stimulations counted as current. [This bound, a working standard of what to count as specious present, I call the *modulus* of stimulation.]

The recovery of a man's current language from his currently observed responses is the task of the linguist who, unaided by an interpreter, is out to penetrate and translate a language hitherto unknown. All the objective data he has to go on are the forces that he sees impinging on the native's surfaces and the observable behavior, vocal and otherwise, of the native. Such data evince native "meanings" only of the most objectively empirical or stimulus-linked variety. And yet the linguist apparently ends up with native "meanings" in some quite unrestricted sense; purported translations, anyway, of all possible native sentences.

Translation between kindred languages, e.g., Frisian and English, is aided by resemblance of cognate word forms. Translation between unrelated languages, e.g., Hungarian and English, may be aided by traditional equations that have evolved in step with a shared culture. What is relevant rather to our purposes is *radical* translation, i.e., translation of the language of a hitherto untouched people. The task is one that is not in practice undertaken in its extreme form, since a chain of interpreters of a sort can be recruited of marginal persons across the darkest archipelago. But the problem is the more nearly approximated the poorer the hints available from interpreters; thus attention to techniques of utterly radical translation has not been wanting.* I shall imagine that all help of interpreters is excluded. Incidentally I shall here ignore phonematic analysis (§ 18), early though it would come in our field

* See Pike.

linguist's enterprise; for it does not affect the philosophical point I want to make.

The utterances first and most surely translated in such a case are ones keyed to present events that are conspicuous to the linguist and his informant. 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. Otherwise he can do little with native terms that have references in common. For suppose the native language includes sentences S_1 , S_2 , and S_3 , really translatable respectively as 'Animal', 'White', and 'Rabbit'. Stimulus situations always differ, whether relevantly or not; and, just because volunteered responses come singly, the classes of situations under which the native happens to have volunteered S_1 , S_2 , and S_3 , are of course mutually exclusive, despite the hidden actual meanings of the words. How then is the linguist to perceive that the native would have been willing to assent to S_1 in all the situations where he happened to volunteer S_2 , and in some but perhaps not all of the situations where he happened to volunteer S_3 ? Only by taking the initiative and querying combinations of native sentences and stimulus situations so as to narrow down his guesses to his eventual satisfaction.

So we have the linguist asking 'Gavagai?' in each of various stimulatory situations, and noting each time whether the native assents, dissents, or neither. But how is he to recognize native assent and dissent when he sees or hears them? Gestures are not to be taken at face value; the Turks' are nearly the reverse of our own. What he must do is guess from observation and then see how well his guesses work. Thus suppose that in asking 'Gavagai?' and the like, in the conspicuous presence of rabbits and the like, he has elicited the responses 'Evet' and 'Yok' often enough to surmise that they may correspond to 'Yes' and 'No', but has no notion which is which. Then he tries the experiment of echoing the native's own volunteered pronouncements. If thereby he pretty regularly elicits 'Evet' rather than 'Yok', he is encouraged to take 'Evet' as 'Yes'. Also he tries responding with 'Evet' and 'Yok' to the native's remarks; the one that is the more serene in its effect is the better

candidate for 'Yes'. However inconclusive these methods, they generate a working hypothesis. If extraordinary difficulties attend all his subsequent steps, the linguist may decide to discard that hypothesis and guess again.³

Let us then suppose the linguist has settled on what to treat as native signs of assent and dissent. He is thereupon in a position to accumulate inductive evidence for translating 'Gavagai' as the sentence 'Rabbit'. The general law for which he is assembling instances is roughly that the native will assent to 'Gavagai' under just those stimulations under which we, if asked, would assent to 'Rabbit'; and correspondingly for dissent.

But we can do somewhat more justice to what the linguist is after in such a case if, instead of speaking merely of stimulations under which the native will assent or dissent to the queried sentence, we speak in a more causal vein of stimulations that will *prompt* the native to assent or dissent to the queried sentence. For suppose the queried sentence were one rather to the effect that someone is away tracking a giraffe. All day long the native will assent to it whenever asked, under all manner of irrelevant attendant stimulations; and on another day he will dissent from it under the same irrelevant stimulations. It is important to know that in the case of 'Gavagai' the rabbit-presenting stimulations actually prompt the assent, and that the others actually prompt the dissent.

In practice the linguist will usually settle these questions of causality, however tentatively, by intuitive judgment based on details of the native's behavior: his scanning movements, his sudden look of recognition, and the like. Also there are more formal considerations which, under favorable circumstances, can assure him of the prompting relation. If, just after the native has been asked S and has assented or dissented, the linguist springs stimulation σ on him, asks S again, and gets the opposite verdict, then he may conclude that σ did the prompting.

Note that to prompt, in our sense, is not to elicit. What elicits the native's 'Evet' or 'Yok' is a combination: the prompting stimulation plus the ensuing query 'Gavagai?'

³ See Firth, *Elements of Social Organization*, p. 23, on the analogous matter of identifying a gesture of greeting.

§ 8. STIMULATION AND STIMULUS MEANING

It is important to think of what prompts the native's assent to 'Gavagai?' as stimulations and not rabbits. Stimulation can remain the same though the rabbit be supplanted by a counterfeit. Conversely, stimulation can vary in its power to prompt assent to 'Gavagai' because of variations in angle, lighting, and color contrast, though the rabbit remain the same. In experimentally equating the uses of 'Gavagai' and 'Rabbit' it is stimulations that must be made to match, not animals.

A visual stimulation is perhaps best identified, for present purposes, with the pattern of chromatic irradiation of the eye. To look deep into the subject's head would be inappropriate even if feasible, for we want to keep clear of his idiosyncratic neural routings or private history of habit formation. We are after his socially inculturated linguistic usage, hence his responses to conditions normally subject to social assessment. (Cf. § 2.) Ocular irradiation is intersubjectively checked to some degree by society and linguist alike, by making allowances for the speaker's orientation and the relative disposition of objects.

In taking the visual stimulations as irradiation patterns we invest them with a fineness of detail beyond anything that our linguist can be called upon to check for. But this is all right. He can reasonably conjecture that the native would be prompted to assent to 'Gavagai' by the microscopically same irradiations that would prompt him, the linguist, to assent to 'Rabbit', even though this conjecture rests wholly on samples where the irradiations concerned can at best be hazarded merely to be pretty much alike.

It is not, however, adequate to think of the visual stimulations as momentary static irradiation patterns. To do so would obstruct examples which, unlike 'Rabbit', affirm movement. And it would make trouble even with examples like 'Rabbit', on another account: too much depends on what immediately precedes and follows a momentary irradiation. A momentary leporiform image flashed by some artifice in the midst of an otherwise rabbitless sequence might not prompt assent to 'Rabbit' even though the same image would have done so if ensconced in a more favorable sequence. The difficulty would thus arise that far from hoping to match the irradiation patterns favorable to 'Gavagai' with those favorable to 'Rabbit', we could not even say unequivocally of an irradiation pattern, of

itself and without regard to those just before and after, that it is favorable to 'Rabbit' or that it is not.¹ Better, therefore, to take as the relevant stimulations not momentary irradiation patterns, but evolving irradiation patterns of all durations up to some convenient limit or *modulus*. Furthermore we may think of the ideal experimental situation as one in which the desired ocular exposure concerned is preceded and followed by a blindfold.

In general the ocular irradiation patterns are best conceived in their spatial entirety. For there are examples such as 'Fine weather' which, unlike 'Rabbit', are not keyed to any readily segregated fragments of the scene. Also there are all those rabbit-free patterns that are wanted as prompting dissent from 'Rabbit'. And as for the patterns wanted as prompting assent to 'Rabbit', whole scenes will still serve better than selected portions might; for the difference between center and periphery, which is such an important determinant of visual attention, is then automatically allowed for. Total ocular irradiation patterns that differ in centering differ also in limits, and so are simply different patterns. One that shows the rabbit too peripherally simply will not be one that prompts assent to 'Cavagai' or 'Rabbit'.

Certain sentences of the type of 'Cavagai' are the sentences with which our jungle linguist must begin, and for these we now have before us the makings of a crude concept of empirical meaning. For meaning, supposedly, is what a sentence shares with its translation; and translation at the present stage turns solely on correlations with non-verbal stimulation.

Let us make this concept of meaning more explicit and give it a neutrally technical name. We may begin by defining the *affirmative stimulus meaning* of a sentence such as 'Cavagai', for a given speaker, as the class of all the stimulations (hence evolving ocular irradiation patterns between properly timed blindfoldings) that would prompt his assent. More explicitly, in view of the end of § 7, a stimulation σ belongs to the affirmative stimulus meaning of a sentence S for a given speaker if and only if there is a stimulation σ' such that if the speaker were given σ' , then were asked S, then were given σ , and then were asked S again, he would dissent the first time and assent the second. We may define the *negative stimulus meaning* similarly with 'assent' and 'dissent' interchanged, and then

¹ This difficulty was raised by Davidson.

define the *stimulus meaning* as the ordered pair of the two. We could refine the notion of stimulus meaning by distinguishing degrees of doubtfulness of assent and dissent, say by reaction time; but for the sake of fluent exposition let us forbear. The imagined equating of 'Cavagai' and 'Rabbit' can now be stated thus: they have the same stimulus meaning.

A stimulus meaning is the stimulus meaning of a sentence for a speaker at a date; for we must allow our speaker to change his ways. Also it varies with the modulus, or maximum duration recognized for stimulations. For, by increasing the modulus we supplement the stimulus meaning with some stimulations that were too long to count before. Fully ticketed, therefore, a stimulus meaning is the stimulus meaning *modulo n* seconds of sentence S for speaker *a* at time *t*.

The stimulations to be gathered into the stimulus meaning of a sentence have for vividness been thought of thus far as visual, unlike the queries that follow them. Actually, of course, we should bring the other senses in on a par with vision, identifying stimulations not with just ocular irradiation patterns but with these and the various barrages of other senses, separately and in all synchronous combinations. Perhaps we can pass over the detail of this.

The affirmative and negative stimulus meanings of a sentence (for a given speaker at a given time) are mutually exclusive. Granted, our subject might be prompted once by a given stimulation σ to assent to S, and later, by a recurrence of σ , to dissent from S; but then we would simply conclude that his meaning for S had changed. We would then reckon σ to his affirmative stimulus meaning of S as of the one date and to his negative stimulus meaning of S as of the other date.

Yet the affirmative and negative stimulus meanings do not determine each other; for many stimulations may be expected to belong to neither. In general, therefore, comparison of whole stimulus meanings can be a better basis for translations than comparison merely of affirmative stimulus meanings.

What now of that strong conditional, the 'would' in our definition of stimulus meaning? Its use here is no worse than its use when we explain 'x is soluble in water' as meaning that x would dissolve if it were in water. What the strong conditional defines is a disposition, in this case a disposition to assent to or dissent from S when variously stimulated. The disposition may be presumed to be some

subtle structural condition, like an allergy and like solubility; like an allergy, more particularly, in not being understood. The ontological status of dispositions, or the philosophical status of talk of dispositions, is a matter which I defer to § 46, but meanwhile we are familiar enough in a general way with how one sets about guessing, from judicious tests and samples and observed uniformities, whether there is a disposition of a specified sort.

The stimulus meaning of a sentence for a subject sums up his disposition to assent to or dissent from the sentence in response to present stimulation. The stimulation is what activates the disposition, as opposed to what instills it (even though the stimulation chance to contribute somehow to the instilling of some further disposition).

Yet a stimulation must be conceived for these purposes not as a dated particular event but as a universal, a repeatable event form. We are to say not that two like stimulations have occurred, but that the same stimulation has recurred. Such an attitude is implied the moment we speak of sameness of stimulus meaning for two speakers. We could indeed overrule this consideration, if we liked, by readjusting our terminology. But there would be no point, for there remains elsewhere a compelling reason for taking the stimulations as universals: viz, the strong conditional in the definition of stimulus meaning. For, consider again the affirmative stimulus meaning of a sentence S: the class Σ of all those stimulations that would prompt assent to S. If the stimulations were taken as events rather than event forms, then Σ would have to be a class of events which largely did not and will not happen, but which would prompt assent to S if they were to happen. Whenever Σ contained one realized or unrealized particular stimulatory event σ , it would have to contain all other unrealized duplicates of σ ; and how many are there of these? Certainly it is hopeless nonsense to talk thus of unrealized particulars and try to assemble them into classes. Unrealized entities have to be construed as universals.

We were impressed in § 3 with the interdependence of sentences. We may well have begun then to wonder whether meanings even of whole sentences (let alone shorter expressions) could reasonably be talked of at all, except relative to the other sentences of an inclusive theory. Such relativity would be awkward, since, conversely, the individual component sentences offer the only way into the theory. Now the notion of stimulus meaning partially resolves the predicament. It isolates a sort of net empirical import of each

of various single sentences without regard to the containing theory, even though without loss of what the sentence owes to that containing theory. It is a device, as far as it goes, for exploring the fabric of interlocking sentences, a sentence at a time.

Between the notion of stimulus meaning and Carnap's remarks on empirical semantics² there are connections and differences worth noting. He suggests exploring the meaning of a term by asking the subject whether he would apply it under various imaginary circumstances, to be described to him. That approach has the virtue of preserving contrasts between such terms as 'goblin' and 'unicorn' despite the non-existence of contrasting instances in the world. Stimulus meaning has the same virtue, since there are stimulation patterns that would prompt assent to 'Unicorn?' and not to 'Goblin?'. Carnap's approach presupposes some decision as to what descriptions of imaginary circumstances are admissible; e.g., 'unicorn' would be not wanted in descriptions used in probing the meaning of 'unicorn'. He hints of appropriate restrictions for the purpose, mentioning "size, shape, color"; and my notion of stimulus meaning itself amounts to a firmer definition in that same direction. There remains a significant contrast in the uses the two of us make of subjunctive conditionals: I limit them to my investigator's considered judgment of what the informant would do if stimulated; Carnap has his investigator putting such conditionals to the judgment of the informant. Certainly my investigator would in practice ask the same questions as Carnap's investigator, as a quick way of estimating stimulus meanings, if language for such questions happened to be available. But stimulus meaning can be explored also at the first stages of radical translation, where Carnap's type of questionnaire is unavailable. On this score it is important, as we shall see in § 12, that my theory has to do primarily with sentences of a sort and not, like Carnap's, with terms.

§ 9. OCCASION SENTENCES. INTRUSIVE INFORMATION

Occasion sentences, as against *standing* sentences, are sentences such as 'Gavagai', 'Red', 'It hurts', 'His face is dirty', which command

² *Meaning and Necessity*, 2d ed., Suppl. D. See also Chisholm, *Perceiving*, pp. 175 ff., and his references.

assent or dissent only if queried after an appropriate prompting stimulation. Verdicts to standing sentences can be prompted too: stimulation implemented by an interferometer once prompted Michelson and Morley to dissent from the standing sentence 'There is ether drift', and a speaker's assent can be prompted yearly to 'The crocuses are out', daily to 'The Times has come'. But these standing sentences contrast with occasion sentences in that the subject may repeat his old assent or dissent unprompted by current stimulation when we ask him again on later occasions, whereas an occasion sentence commands assent or dissent only as prompted all over again by current stimulation. Standing sentences grade off toward occasion sentences as the interval between possible repromptings diminishes; and the occasion sentence is the extreme case where that interval is less than the modulus. Like the stimulus meanings themselves, the distinction between standing sentences and occasion sentences is relative to the modulus; an occasion sentence modulo n seconds can be a standing sentence modulo $n - 1$.

The stimulations belonging to neither the affirmative nor the negative stimulus meaning of an occasion sentence are just those that would inhibit a verdict on the queried sentence, whether through indecisiveness (as in the case of a poor glimpse) or through shocking the subject out of his wits. On the other hand the stimulations belonging to neither the affirmative nor the negative stimulus meaning of a standing sentence are of two sorts: besides the inhibitory ones there are the *irrelevant* ones, which neither prompt nor inhibit. Querying the sentence on the heels of such a stimulation would elicit a verdict, but always the one that the query would have elicited without the attendant stimulation; never a change of verdict.

The stimulus meaning is a full cross-section of the subject's evolving dispositions to assent to or dissent from a sentence, if the sentence is an occasion sentence; less so if it is a standing sentence. Standing sentences can differ among themselves in "meaning," by any intuitive account,¹ as freely as occasion sentences; but, the less susceptible they are to prompted assent and dissent, the fewer clues are present in stimulus meaning. The notion of stimulus meaning

¹ Twice I have been startled to find my use of 'intuitive' misconstrued as alluding to some special and mysterious avenue of knowledge. By an intuitive account I mean one in which terms are used in habitual ways, without reflecting on how they might be defined or what presuppositions they might conceal.

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is thus most important for occasion sentences, and we shall limit our attention for a while to them.

Even for such favored occasion sentences as 'Cavagai' and 'Rabbit', actually, sameness of stimulus meaning has its shortcomings as a synonymy relation. The difficulty is that an informant's assent to or dissent from 'Cavagai?' can depend excessively on prior collateral information as a supplement to the present prompting stimulus. He may assent on the occasion of nothing better than an ill-glimpsed movement in the grass, because of his earlier observation, unknown to the linguist, of rabbits near the spot. Since the linguist would not on his own information be prompted by that same poor glimpse to assent to 'Rabbit?', we have here a discrepancy between the present stimulus meaning of 'Cavagai' for the informant and that of 'Rabbit' for the linguist.

More persistent discrepancies of the same type can be imagined, affecting not one native but all, and not once but regularly. There may be a local rabbit-fly,² unknown to the linguist, and recognizable some way off by its long wings and erratic movements; and seeing such a fly in the neighborhood of an ill-glimpsed animal could help a native to recognize the latter as a rabbit. Ocular irradiations combining poor glimpses of rabbits with good ones of rabbit-flies would belong to the stimulus meaning of 'Cavagai' for natives generally, and not to that of 'Rabbit' for the linguist.

And, to be less fanciful, there are all those stimulations that incorporate verbal hints from native kibitzers. Thus suppose that the stimulation on the heels of which the informant is asked 'Cavagai?' is a composite stimulation presenting a bystander pointing to an ill-glimpsed object and saying 'Cavagai'. This composite stimulation will probably turn out to belong to the affirmative stimulus meaning of 'Cavagai' for the informant, and not to the stimulus meaning of 'Rabbit' for most English speakers, on whom the force of the bystander's verbal intervention would be lost. Such cases would not fool our linguist, but they do count against defining synonymy as sameness of stimulus meaning. For we must remember that every sufficiently brief stimulation pattern, though it be one that never gets actualized or that the linguist would never use, still by definition belongs to the stimulus meaning of 'Cavagai' for a man at a given time if it is one that *would* prompt his assent at that time.

² Here I am indebted to Davidson.

Intuitively the ideal would be to accord to the affirmative meaning of 'Gavagai' just those stimulations that would prompt assent to 'Gavagai' on the strength purely of an understanding of 'Gavagai', unaided by collateral information: unaided by recent observation of rabbits near the spot, unaided by knowledge of the nature and habits of the rabbit-fly, unaided by converseance with the kibitzer's language. On the face of it there is a difficulty in excluding this third aid, considering our continuing dependence on the subject's understanding of 'Gavagai'. But also the trouble is more widespread. It is precisely that we have made no general experimental sense of a distinction between what goes into a native's learning to apply an expression and what goes into his learning supplementary matters about the objects concerned. True, the linguist can press such a distinction part way; he can filter out such idiosyncratic bits of collateral matter as the informant's recent observation of rabbits near the spot, by varying his times and his informants and so isolating a more stable and more social stimulus meaning as common denominator. But any socially shared information, such as that about the rabbit-fly or the ability to understand a bystander's remark, will continue to affect even that common denominator. There is no evident criterion whereby to strip such effects away and leave just the meaning of 'Gavagai' properly so-called—whatever meaning properly so-called may be.

Thus, to depict the difficulty in more general terms, suppose it said that a particular class Σ comprises just those stimulations each of which suffices to prompt assent to a sentence S outright, without benefit of collateral information. Suppose it said that the stimulations comprised in a further class Σ' , likewise sufficient to prompt assent to S , owe their efficacy rather to certain widely disseminated collateral information, C . Now couldn't we just as well have said, instead, that on acquiring C , men have found it convenient implicitly to change the very "meaning" of S , so that the members of Σ' now suffice outright like members of Σ ? I suggest that we may say either; even historical clairvoyance would reveal no distinction, though it reveal all stages in the acquisition of C , since meaning can evolve *pari passu*. The distinction is illusory: as mistaken as the notion, scouted in § 4, that we can determine separately what to talk about and what to say about it. It is simply a question whether to call the transitivity shortcuts (§ 3) changes of meaning or condensations of proof; and in fact an unreal question. What we

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objectively have is just an evolving adjustment to nature, reflected in an evolving set of dispositions to be prompted by stimulations to assent to or dissent from sentences. These dispositions may be conceded to be impure in the sense of including worldly knowledge, but they contain it in a solution which there is no precipitating.

Incidentally, note that stimulus meanings as defined in § 8 can even suffer some discrepancies that are intuitively attributable neither to differences of meaning nor to differences of collateral information. Thus take shocked silence. To begin with, if the speaker is already stunned at time t , all stimulus meanings for him at t will be empty. This outcome of the definition of stimulus meaning is unnatural but harmless, since we can ignore stimulus meanings for stunned persons. But in the case of a speaker alert at t there are stimulations that *would* stun him at t and so *would* preclude any assent to or dissent from the ensuing 'Gavagai'. These, by definition, belong to neither the affirmative nor the negative stimulus meaning of 'Gavagai' for him at t . Now where a discrepancy in stimulus meanings will ensue is where a stimulation is such as would stun one speaker and not another; for it could be long say to the negative stimulus meaning of 'Gavagai' or 'Rabbit' for the latter speaker and to neither the affirmative nor the negative stimulus meaning for the former speaker. This again is a discrepancy that would not puzzle the linguist, but that exists under our definition. Also there are interferences of less drastic sorts. The native may dissent from 'Gavagai' in plain sight of the rabbit's ears, because the rabbit is in no position for shooting;⁸ he has misjudged the linguist's motive for asking 'Gavagai'.

We have now seen that stimulus meaning as defined falls short in various ways of one's intuitive demands on "meaning" as undefined, and that sameness of stimulus meaning is too strict a relation to expect between a native occasion sentence and its translation—even in so benign a case as 'Gavagai' and 'Rabbit'. Yet stimulus meaning, by whatever name, may be properly looked upon still as the objective reality that the linguist has to probe when he undertakes radical translation. For the stimulus meaning of an occasion sentence is by definition the native's total battery of present dispositions to be prompted to assent to or to dissent from the sentence; and these dispositions are just what the linguist has to sample and estimate.

⁸ Here I am indebted to Raymond Firth.

We do best to revise not the notion of stimulus meaning, but only what we represent the linguist as doing with stimulus meanings. The fact is that he translates not by identity of stimulus meanings, but by significant approximation of stimulus meanings.

If he translates 'Gavagai' as 'Rabbit' despite the discrepancies in stimulus meaning imagined above, he does so because the stimulus meanings seem to coincide to an overwhelming degree and the discrepancies, so far as he finds them, seem best explained away or dismissed as effects of unidentified interferences. Some discrepancies he may sift out, as lately suggested, by varying his times and informants. Some, involving poor glimpses or shock or verbal intrusions, he would not even bother to bring to fulfillment by a querying of the sentence. Some, such as those involving the rabbitly, he will dismiss as effects of unidentified interferences if he does not encounter them often. In taking this last rather high line, clearly he is much influenced by his natural expectation that any people in rabbit country would have some brief expression that could in the long run be best translated simply as 'Rabbit'. He conjectures that the now-unexplained discrepancies between 'Gavagai' and 'Rabbit' are ones that may eventually be reconciled with his translation, after he has somehow got deep enough into the native language to ask sophisticated questions.

In practice, of course, the natural expectation that the natives will have a brief expression for 'Rabbit' counts overwhelmingly. The linguist hears 'Gavagai' once, in a situation where a rabbit seems to be the object of concern. He will then try 'Gavagai' for assent or dissent in a couple of situations designed perhaps to eliminate 'White' and 'Animal' as alternative translations, and will forthwith settle upon 'Rabbit' as translation without further experiment—though always in readiness to discover through some unsought experience that a revision is in order. I made the linguist prefer naturally circumspect, and maximized his bad luck in respect of discrepant observations, in order to consider what theoretical bearing a native's collateral information can have upon the linguist's in fact wholly facile opening translation.

§ 10. OBSERVATION SENTENCES

Some stimulus meanings are less susceptible than others to the influences of intrusive information. There is on this score a signi-

ficant contrast between 'Red' and 'Rabbit' even when 'Red' is taken on a par with 'Rabbit' as announcing not a passing sense datum but an enduring objective trait of the physical object. True, there are extreme cases where we may be persuaded, by collateral information about odd lighting and juxtaposition, that something is really red that did not seem so or vice versa; but, despite such cases, there is less scope for collateral information in deciding whether a glimpsed thing is red than in deciding whether it is a rabbit. In the case of 'Red', therefore, sameness of stimulus meaning comes unusually close to what one intuitively expects of synonymy.

Color words are notoriously ill matched between remote languages, because of differences in customary grouping of shades. But this is no present problem; it means merely that there may well be no native occasion sentence, at least no reasonably simple one, with approximately the stimulus meaning of 'Red'. Again, even if there is one, there may still be a kind of trouble in equating it to 'Red', just because of the vagueness of color boundaries in both languages. But this again is no problem of collateral information; it is a difficulty that would remain even if a distinction between meaning and collateral information were successfully drawn. It can be coped with by a rough matching of statistical scatterings. The penumbra of vagueness of 'Red' consists of stimulations in respect of which the stimulus meanings of 'Red' tend to vary from speaker to speaker and from occasion to occasion; correspondingly for the penumbra of vagueness of the native sentence; and then 'Red' is a good translation to the extent that it resembles the native sentence umbra for umbra and penumbra for penumbra.

In terms of direct behavioral evidence, how do those fluctuations of stimulus meaning that are attributable to a penumbra of vagueness differ from those fluctuations of stimulus meaning (e.g. of 'Gavagai') that are laid to variations of collateral information from occasion to occasion? Partly in that the penumbral fluctuations increase rather smoothly as the stimulations grade off, while the fluctuations laid to collateral information are more irregular, suggesting intrusion of extraneous factors. But mainly in that each individual's assent or dissent tends to be marked by doubt and hesitation when the prompting stimulation belongs to the penumbra. If we were to complicate the notion of stimulus meaning to the extent of weighting each stimulation inversely according to reaction

time (cf. § 8), then discrepancies in stimulus meaning from speaker to speaker would tend to count for little where due to vagueness, and for more where not.

If 'Red' is somewhat less susceptible than 'Rabbit' to the influences of intrusive information, there are other sentences that are vastly more so. An example is 'Bachelor'. An informant's assent to it is prompted genuinely enough by the sight of a face, yet it draws mainly on stored information and none on the prompting stimulation except as needed for recognizing the bachelor friend concerned. As one says in the uncritical jargon of meaning, the trouble with 'Bachelor' is that its meaning transcends the looks of the prompting faces and concerns matters that can be known only through other channels. 'Rabbit' is a little this way, as witness *papier-mâché* counterfeits; 'Bachelor' much more so. The stimulus meaning of 'Bachelor' cannot be treated as its "meaning" by any stretch of the imagination, unless perhaps accompanied by a stretch of the moduli.

A mark of the intrusion of collateral information, except when the information is generally shared as in the examples of the kibitzer and the rabbit-fly (§ 9), was discrepancy in stimulus meaning from speaker to speaker of the same language. In a case like 'Bachelor', therefore, we may expect the discrepancies to be overwhelming; and indeed they are. For any two speakers whose social contacts are not virtually identical, the stimulus meanings of 'Bachelor' will diverge far more than those of 'Rabbit'.

The less susceptible the stimulus meaning of an occasion sentence is to the influences of collateral information, the less absurdity there is in thinking of the stimulus meaning of the sentence as the meaning of the sentence. Occasion sentences whose stimulus meanings vary none under the influence of collateral information may naturally be called *observation sentences*, and their stimulus meanings may without fear of contradiction be said to do full justice to their meanings. These are the occasion sentences that wear their meanings on their sleeves. Or, better, we may speak of degrees of observationality; for even the stimulus meaning of 'Red' can, we noted, be made to fluctuate a little from occasion to occasion by collateral information on lighting conditions. What we have is a gradation of observationality from one extreme, at 'Red' or above, to the other extreme at 'Bachelor' or below.

In the foregoing paragraph we have wallowed most unfastidiously

in the conceptual slough of meaning and collateral information. But now it is interesting to note that what we have dredged out, a notion of degree of observationality, is not beyond cleaning up and rendering respectable. For, in behavioral terms, an occasion sentence may be said to be the more observational the more nearly its stimulus meanings for different speakers tend to coincide. Granted, this definition fails to give demerit marks for the effects of generally shared information, such as that about the rabbit-fly. But, as argued in § 9, I suspect that no systematic experimental sense is to be made of a distinction between usage due to meaning and usage due to generally shared collateral information.

The notion of observationality is relative to the modulus of stimulation. This is not to be wondered at, since the notion of stimulus meaning was relative to the modulus (cf. § 8), and so is the very distinction between habit formation and habit formed (cf. § 7). Observationality increases with the modulus, in the following way. A typical case of discrepancy between the stimulus meanings of 'Gavagai', for two natives, is the case where one native and not the other has lately seen rabbits near the spot that they are now viewing. An ill-glimpsed movement would now prompt the one native and not the other to assent to 'Gavagai'. But if we make the modulus long enough to include as part of the one native's present stimulation his recent observation of rabbits near the spot, then what had been a discrepancy between stimulus meanings is a mere difference of stimulations: the one stimulation is such as would prompt either native to assent, and the other neither. Increase the modulus sufficiently to take in extended periods of learning about friends and you even increase the observationality of 'Bachelor'. But let us forget moduli again for a while, thus keeping our variables down.

We have defined observationality for occasion sentences somewhat vaguely, as degree of constancy of stimulus meaning from speaker to speaker. It would not do to use this definition generally among standing sentences, since the stimulus meaning of a standing sentence can show fair constancy from speaker to speaker for the wrong reason: mere sparseness of member stimulations. Among standing sentences that are well over toward the occasion end (cf. § 9), however, the notion of observationality works quite as well as among occasion sentences, and is significant in the same way; viz., the higher the observationality, the better we can get on

with translation by stimulus meaning. We could hope, e.g., to translate 'The tide is out' by a rough matching of stimulus meanings; not so 'There is a famous novelist on board'.

* Viewing the graded notion of observability as the primary one, we may still speak of sentences simply as observation sentences when they are high in observability. In a narrow sense, just 'Red' would qualify; in a wider sense, also 'Rabbit' and 'The tide is out'. It is for observation sentences in some such sense that the notion of stimulus meaning constitutes a reasonable notion of meaning.

To philosophers 'observation sentence' suggests the datum sentences of science. On this score our version is not amiss; for the observation sentences as we have identified them are just the occasion sentences on which there is pretty sure to be firm agreement on the part of well-placed observers. Thus they are just the sentences on which a scientist will tend to fall back when pressed by doubting colleagues. Moreover, the philosophical doctrine of infallibility of observation sentences is sustained under our version. For there is scope for error and dispute only insofar as the connections with experience whereby sentences are appraised are multifarious and indirect, mediated through time by theory in conflicting ways; there is none insofar as verdicts to a sentence are directly keyed to present stimulation. (This immunity to error is, however, like observability itself, for us a matter of degree.) Our version of observation sentences departs from a philosophical tradition in allowing the sentences to be about ordinary things instead of requiring them to report sense data, but this departure has not lacked proponents.¹

In estimating the stimulus meaning of a sentence for a speaker at a given time, the linguist is helped by varying the time and speaker. In choosing a translation, he is helped by comparing native speakers and so eliminating idiosyncrasies of stimulus meaning. Still the notion of stimulus meaning itself, as defined, depends on no multi-

¹ For remarks on this matter and references see von Mises, *Positivism*, pp. 91-95, 379. To the main theme of this paragraph I sense harmony in Strawson, *Individuals*, p. 212: "If any facts deserve . . . to be called . . . atomic facts, it is the facts stated by those propositions which demonstratively indicate the incidence of a general feature." For the propositions alluded to seem, in the light of adjacent text, to correspond pretty well to what I have called occasion sentences.

licity of speakers. Now the notion of observability, in contrast, is social. The behavioral definition offered for it above turns on similarities of stimulus meanings over the community.

xii What makes an occasion sentence low on observability is, by definition, wide intersubjective variability of stimulus meaning. Language as a socially inculcated set of dispositions is substantially uniform over the community, but it is uniform in different ways for different sentences. If a sentence is one that (like 'Red' and 'Rabbit') is inculcated mostly by something like direct ostension, the uniformity will lie at the surface and there will be little variation in stimulus meaning; the sentence will be highly observational. If it is one that (like 'Bachelor') is inculcated through connections with other sentences, linking up thus indirectly with past stimulations of other sorts than those that serve directly to prompt present assent to the sentence, then its stimulus meaning will vary with the speakers' pasts, and the sentence will count as very unobservational. The stimulus meaning of a very unobservational occasion sentence for a speaker is a product of two factors, a fairly standard set of sentence-to-sentence connections and a random personal history; hence the largely random character of the stimulus meaning from speaker to speaker.

Now this random character has the effect not only that the stimulus meaning of the sentence for one speaker will differ from the stimulus meaning of *that* sentence for other speakers. It will differ from the stimulus meaning also of any other discoverable sentence for other speakers, in the same language or any other. Granted, a great complex English sentence can be imagined whose stimulus meaning for one man matches, by sheer exhaustion of cases, another man's stimulus meaning of 'Bachelor'; but such a sentence would never be spotted, because nobody's stimulus meaning of 'Bachelor' would ever be suitably inventoried to begin with.

For, consider again how it was with 'Cavagai'. Here the stimulations belonging to the affirmative stimulus meaning share a distinctive trait that is salient, to us as well as to the native: the containing of rabbit glimpses. The trait is salient enough so that the linguist generalizes on it from samples: he expects the next glimpse of a rabbit to prompt assent to 'Cavagai' as past ones have. His generalization is repeatedly borne out, and he concludes with his conjecture that the native's whole stimulus meaning of 'Cavagai'—never experimentally exhausted, of course—will tend to match ours

of 'Rabbit'. Now a similar effort with a non-observational native occasion sentence, of the type of our 'Bachelor', would have bogged down in its early stages. Sample stimulations belonging to the affirmative stimulus meaning of such a sentence, for the given native, would show no tempting common traits by which to conjecture further cases, or none but such as fail to hold up on further tries.

§ 11. INTRASUBJECTIVE SYNONYMY OF OCCASION SENTENCES

Stimulus meaning remains defined without regard to observability. But when applied to non-observational sentences like 'Bachelor' it bears little resemblance to what might reasonably be called meaning. Translation of 'Soltero' as 'Bachelor' manifestly cannot be predicated on identity of stimulus meanings between speakers; nor can synonymy of 'Bachelor' and 'Unmarried man'.

But curiously enough the stimulus meanings of 'Bachelor' and 'Unmarried man' are, despite all this, identical for any one speaker.¹ An individual would at any one time be prompted by the same stimulations to assent to 'Bachelor' and 'Unmarried man'; and similarly for dissent. *Stimulus synonymy*, or sameness of stimulus meaning, is as good a standard of synonymy for non-observational occasion sentences as for observation sentences as long as we stick to one speaker. For each speaker, 'Bachelor' and 'Unmarried man' are stimulus-synonymous without having the same meaning in any acceptably defined sense of 'meaning' (for stimulus meaning is, in the case of 'Bachelor', nothing of the kind). Very well; here is a case where we may welcome the synonymy and let the meaning go. The one-speaker restriction presents no obstacle to saying that 'Bachelor' and 'Unmarried man' are stimulus-synonymous for the whole community, in the sense of being thus for each member. A

¹ It can be argued that this much-used example of synonymy has certain imperfections having to do with ages, divorce, and bachelors of arts. Another example much used in philosophy, 'brother' and 'male sibling', may be held to bog down under certain church usages. An example that is perhaps unassailable is 'mother's father' and 'maternal grandfather' (poetic connotations not being here in point), or 'widower' and 'man who lost his wife' (Jakobson). However, with this much by way of caveat against quibbling, perhaps we can keep to our conventional example and overlook its divergences.

§ 11

INTRASUBJECTIVE SYNONYMY

practical extension even to the two-language case is not far to seek if a bilingual speaker is at hand. 'Bachelor' and 'Soltero' will be stimulus-synonymous for him. Taking him as a sample, we may treat 'Bachelor' and 'Soltero' as synonymous for the translation purposes of the two whole linguistic communities that he represents. Whether he is a good enough sample would be checked by observing the fluency of his communication in both communities and by comparing other bilinguals.

Section 10 left the linguist unable to guess the trend of the stimulus meaning of a non-observational occasion sentence from sample cases. We now see a way, though costly, in which he can still accomplish radical translation of such sentences. He can settle down and learn the native language directly as an infant might.² Having thus become bilingual, he can translate the non-observational occasion sentences by introspected stimulus synonymy.

This step has the notable effect of initiating clear recognition of native falsehoods. As long as the linguist does no more than correlate the native's observation sentences with his own by stimulus meaning, he cannot discount any of the native's verdicts as false—unless *ad hoc*, most restrainedly, to simplify his correlations. But once he becomes bilingual and so transcends the observation sentences, he can bicker with the native as a brother.

Even short of going bilingual there is no difficulty in comparing two non-observational native sentences to see if they are intrasubjectively stimulus-synonymous for the native. The linguist can do this without having intuitively conjectured the trend of stimulus meaning of either sentence. He need merely query the sentences in parallel under random stimulations until he either hits a stimulation that prompts assent or dissent to one sentence and not to the other, or else is satisfied at last that he is not going to. A visiting Martian who never learns under what circumstances to apply 'Bachelor', or 'Unmarried man' either, can still find out by the above method that 'Bachelor' for one English speaker does not have the same stimulus meaning as 'Bachelor' for a different English speaker and that it has the same as 'Unmarried man' for the same speaker. He can, anyway, apart from one difficulty: there is no evident reason why it should occur to him thus blindly to try comparing 'Unmarried man' with 'Bachelor'. This difficulty makes the intrasubjec-

² See Chapter III for reflections on the infant's learning of our own language.

tive stimulus synonymy of non-observational occasion sentences less readily accessible to an alien linguist than the stimulus synonymy of observation sentences such as 'Cavagai' and 'Rabbit'. Still the linguist can examine for intrasubjective stimulus synonymy any pair of native occasion sentences that it occurs to him to wonder about; and we shall see in §15 how indirect considerations can even suggest such pairs for examination.

Between the stimulus meaning of any sentence for one man and the stimulus meaning of the same or any other sentence for another man there are almost bound to be countless discrepancies in point of verbally contaminated stimulations, as long as one man understands a language that the other does not. The argument is that of the kibitzer case in §9. The translating linguist had for this reason to discount verbally contaminated discrepancies. But intrasubjective comparisons are free of this trouble. Intrasubjectively we can even compare the occasion sentences 'Yes', 'Uh huh', and 'Quite' for stimulus synonymy, though the stimulations that enter into the stimulus meanings of these sentences are purely verbal in their relevant portions. A further advantage of the intrasubjective situation appears in the case of stimulations that would at a given time shock one speaker and not another into silence (cf. §9): for clearly these will constitute no discrepancies intrasubjectively. Altogether the equating of stimulus meanings works out far better intrasubjectively than between subjects: it goes beyond observation sentences, it absorbs shock, and it better accommodates verbal stimulations.

Verbal stimulations can plague even the intrasubjective comparisons when they are stimulations of "second intention"—i.e., when besides consisting of words they are about words. Second-intention examples are the bane of theoretical linguistics, also apart from synonymy studies. Thus take the linguist engaged in distinguishing between those sequences of sounds or phonemes that can occur in English speech and those that cannot: all his excluded forms can return to confound him in second-intention English, as between quotation marks. Now some second-intention stimulations that could prompt a subject to assent to one of the queries 'Bachelor?' and 'Unmarried man?' to the exclusion of the other are as follows: a stimulation presenting the spelling of 'bachelor'; a stimulation presenting the words 'rhymes with 'harried man''; a stimulation presenting a glimpse of a bachelor friend together with a plea to

redefine 'bachelor'. It is not easy to find a behavioral criterion of second-intention whereby to screen such cases, especially the last.

Leaving that problem unsolved, we have still to note another and more huddled restriction that needs to be observed in equating sentences by stimulus meanings: we should stick to short sentences. Otherwise subjects' mere incapacity to digest long questions can, under our definitions, issue in difference of stimulus meanings between long and short sentences which we should prefer to find synonymous. A stimulation may prompt assent to the short sentence and not to the long one just because of the opacity of the long one; yet we should then like to say not that the subject has shown the meaning of the long sentence to be different, but merely that he has failed to encompass it. Still a concept of synonymy initially significant only for short sentences can be extended to long sentences by analogy; e.g. as follows. By a *construction*, linguistically speaking, let us understand any fixed way of building a composite expression from arbitrary components of appropriate sort, one or more at a time. (What is fixed may include certain additive words, as well as the way of arranging the unfixd components.) Now two sentence-forming constructions may be so related that whenever applied to the same components they yield mutually synonymous results, as long as the results are short enough to be compared for synonymy. In this event it is natural, by extension, to count also as mutually synonymous any results of applying those constructions to identical components however long. But to simplify ensuing considerations let us continue to reason without reference to this refinement where we can.

Our success with 'Bachelor' and 'Unmarried man' has been sufficient, despite the impasse at second intention, to tempt us to overestimate how well intrasubjective stimulus synonymy withstands collateral information. By way of corrective, consider the Himalayan explorer who has learned to apply 'Everest' to a distant mountain seen from Tibet and 'Gaurisankar' to one seen from Nepal. As occasion sentences these words have mutually exclusive stimulus meanings for him until his explorations reveal, to the surprise of all concerned, that the peaks are identical. His discovery is painfully empirical, not lexicographic: nevertheless the stimulus meanings of 'Everest' and 'Gaurisankar' coincide for him thenceforward.⁸

⁸ I am indebted to Davidson for this point and to Schödinger, *What Is Life?*, for the example. I am told that the example is wrong geographically.

Or again consider the occasion sentences 'Indian nickel' and 'Buffalo nickel'. These have distinct stimulus meanings for a boy for his first minute or two of passive acquaintance with these coins, and when he gets to turning them over the stimulus meanings tend to fuse.

Do they fully fuse? The question whether 'Indian nickel' and 'Buffalo nickel' have the same stimulus meaning for a given subject is the question whether any sequence of ocular irradiations or other stimulation (within the modulus), realized or not, *would* now prompt the subject to assent to or dissent from 'Indian nickel' and not 'Buffalo nickel' or vice versa. Among such stimulations are those that present, to all appearances, a coin whose obverse is like that of an Indian nickel but whose reverse bears some device other than the buffalo. Such stimulations can with a little felony even be realized. After a modulus-long examination of such a hybrid coin, a novice might conclude with surprise that there are after all two kinds of Indian nickel, while an expert, sure of his numismatics, might conclude that the coin must be fraudulent. For the expert, 'Indian nickel' and 'Buffalo nickel' are stimulus-synonymous; for the novice not.

The novice does believe and continues to believe, as the expert does, that all Indian nickels are buffalo nickels and vice versa; for the novice has not been and will not be actually subjected to the surprising stimulation described. But the mere fact that there is such a stimulation pattern and that the novice *would* now thus respond to it (whether we know it or not) is what, by definition, makes the stimulus meanings of 'Indian nickel' and 'Buffalo nickel' differ for the novice even as of now.

To keep our example pertinent we must abstract from what may be called the conniving mode of speech: the mode in which we knowingly speak of Olivier as Macbeth, of a statue of a horse as a horse, of a false nickel as a nickel. Even the expert would in practice speak of the prepared coin as "that Indian nickel with the whoozis on the back," adding that it was phony. Here we have a broader usage of 'nickel', under which nobody would seriously maintain even that all Indian nickels are in point of fact buffalo nickels and vice versa; whereas our purpose in the example is to examine two supposedly coextensive terms for sameness of stimulus meaning. In the example, therefore, read 'Indian nickel' and 'buffalo nickel' as 'real Indian nickel', 'real buffalo nickel'.

From the example we see that two terms can in fact be coextensive, or true of the same things, without being intrasubjectively stimulus-synonymous as occasion sentences. They can be believed coextensive without being, even for the believer, stimulus-synonymous as occasion sentences; witness 'Indian nickel' and 'Buffalo nickel' for the novice. But when as in the expert's case the belief is so firm that no pattern of stimulation (within the modulus) would suffice to dislodge it, they are stimulus-synonymous as occasion sentences.

So it is apparent that intrasubjective stimulus synonymy remains open to criticism, from intuitive preconceptions, for relating occasion sentences whose stimulus meanings coincide on account of collateral information. Now there is still a way of cutting out the effects of idiosyncratic information: we can hold out for virtual constancy over the community. In this social sense of stimulus synonymy, 'Indian nickel' and 'Buffalo nickel' would cease to count as stimulus-synonymous, because of such speakers as our novice; whereas 'Bachelors' and 'Unmarried man' might still rate as stimulus-synonymous even socially, as being intrasubjectively stimulus-synonymous for nearly everybody. There is still no screen against the effects of collateral information common to the community; but, as urged in § 9, I think that at that point the ideal becomes illusory.

§ 12. SYNONYMY OF TERMS

In starting our consideration of meaning with sentences we have hewn the line of §§ 3 and 4, where it was stressed that words are learned only by abstraction from their roles in learned sentences. But there are one-word sentences, such as 'Red' and 'Rabbit'. Insofar as the concept of stimulus meaning may be said to constitute in some strained sense a meaning concept for these, it would seem to constitute a meaning concept for general terms like 'red' and 'rabbit'. This, however, is a mistake. Stimulus synonymy of the occasion sentences 'Gavagai' and 'Rabbit' does not even guarantee that 'gavagai' and 'rabbit' are coextensive terms, terms true of the same things.

For, consider 'gavagai'. Who knows but what the objects to which this term applies are not rabbits after all, but mere stages, or brief temporal segments, of rabbits? In either event the stimulus

situations that prompt assent to 'Gavagai' would be the same as for 'Rabbit'. Or perhaps the objects to which 'gavagai' applies are all and sundry undetached parts of rabbits; again the stimulus meaning would register no difference. When from the sameness of stimulus meanings of 'Gavagai' and 'Rabbit' the linguist leaps to the conclusion that a gavagai is a whole enduring rabbit, he is just taking for granted that the native is enough like us to have a brief general term for rabbits and no brief general term for rabbit stages or parts.

A further alternative likewise compatible with the same old stimulus meaning is to take 'gavagai' as a singular term naming the fusion, in Goodman's sense, of all rabbits: that single though discontinuous portion of the spatiotemporal world that consists of rabbits. Thus even the distinction between general and singular terms is independent of stimulus meaning. The same point can be seen by considering, conversely, the singular term 'Bernard J. Ortcutt': it differs none in stimulus meaning from a general term true of each of the good dean's temporal segments, and none from a general term true of each of his spatial parts. And a still further alternative in the case of 'gavagai' is to take it as a singular term naming a recurring universal, rabbithood. The distinction between concrete and abstract object, as well as that between general and singular term, is independent of stimulus meaning.

Commonly we can translate something (e.g. 'for the sake of') into a given language though nothing in that language corresponds to certain of the component syllables. Just so the occasion sentence 'Gavagai' is translatable as saying that a rabbit is there, even if no part of 'Gavagai' nor anything at all in the native language quite corresponds to the term 'rabbit'. Synonymy of 'Gavagai' and 'Rabbit' as sentences turns on considerations of prompted assent; not so synonymy of them as terms. We are right to write 'Rabbit', instead of 'rabbit', as a signal that we are considering it in relation to what is synonymous with it as a sentence and not in relation to what is synonymous with it as a term.

Does it seem that the imagined indecision between rabbits, stages of rabbits, integral parts of rabbits, the rabbit fusion, and rabbithood must be due merely to some special fault in our formulation of stimulus meaning, and that it should be resolvable by a little supplementary pointing and questioning? Consider, then, how. Point to a rabbit and you have pointed to a stage of a rabbit, to an integral part of a rabbit, to the rabbit fusion, and to where

rabbithood is manifested. Point to an integral part of a rabbit and you have pointed again to the remaining four sorts of things; and so on around. Nothing not distinguished in stimulus meaning itself is to be distinguished by pointing, unless the pointing is accompanied by questions of identity and diversity: 'Is this the same gavagai as that?', 'Do we have here one gavagai or two?'. Such questioning requires of the linguist a command of the native language far beyond anything that we have as yet seen how to account for. We cannot even say what native locutions to count as analogues of terms as we know them, much less equate them with ours term for term, except as we have also decided what native devices to view as doing in their devious ways the work of our own various auxiliaries to objective reference: our articles and pronouns, our singular and plural, our copula, our identity predicate.¹ The whole apparatus is interdependent, and the very notion of term is as provincial to our culture as are those associated devices. The native may achieve the same net effects through linguistic structures so different that any eventual construing of our devices in the native language and vice versa can prove unnatural and largely arbitrary. (Cf. § 15.) Yet the net effects, the occasion sentences and not the terms, can match up in point of stimulus meanings as well as ever for all that. Occasion sentences and stimulus meaning are general coin; terms and reference are local to our conceptual scheme.²

It will perhaps be countered that there is no essential difficulty in spotting judgments of identity on the part of the jungle native, or even of a speechless animal. This is true enough for qualitative identity, better called resemblance. In an organism's susceptibility to the conditioning of responses we have plentiful criteria for his standards of resemblance of stimulations. (Cf. § 17.) But what is relevant to the preceding reflections is numerical identity. Two pointings may be pointings to a numerically identical rabbit, to numerically distinct rabbit parts, and to numerically distinct rabbit stages; the inscrutability lies not in resemblance, but in the anatomy

¹ Strawson is making this point when he writes that "feature-placing sentences do not introduce particulars into our discourse" ("Particular and general," p. 244). See below, § 45, for a link with Brentano's thesis.

² Russell conceived of what he called "object words" as in effect occasion sentences (*Inquiry*, Ch. IV), but, like Carnap (see end of § 8, above), he failed to note the present point: that the use of a word as an occasion sentence, however determinate, does not fix the extension of the word as a term.

of sentences. We could equate a native expression with any of the disparate English terms 'rabbit', 'rabbit stage', 'undetached rabbit part', etc., and still, by compensatorily juggling the translation of numerical identity and associated particles, preserve conformity to stimulus meanings of occasion sentences.⁸

Intrasubjective stimulus synonymy, for all its advantages over the two-speaker case, is similarly powerless to equate terms. Our Martian of § 11 can find as he did that 'Bachelor' and 'Unmarried man' are synonymous occasion sentences for the English speaker, but still either *term* to the exclusion of the other might, so far as he knows, apply not to men but to their stages or parts or even to a scattered concrete totality or an abstract attribute.

We saw in § 11 that coextensiveness of terms, or even believed coextensiveness, is not sufficient for their stimulus synonymy as occasion sentences. We now see also that it is not necessary. Where other languages than our own are involved, coextensiveness of terms is not a manifestly clearer notion than synonymy or translation itself; it is no clearer than the considerations, whatever they are (§§ 15 and 16), that make for contextual translation of the identity predicate, the copula, and related particles.

Yet surely the main interest of the synonymy of 'Bachelor' and 'Unmarried man' as occasion sentences was the line it seemed to give on the synonymy of 'bachelor' and 'unmarried man' as terms. Now within English the situation is not beyond saving. To get synonymy of terms from synonymy of the corresponding occasion sentences we need only add a condition that will screen out such pairs as 'bachelor' and 'part of a bachelor'; and this we can do by requiring that the subject be prepared to assent to the standing sentence 'All *F*s are *G*s and vice versa', thinking of '*F*' and '*G*' as the terms in question. The definition becomes this: '*F*' and '*G*' are stimulus-synonymous as terms for a speaker at *t* if and only if as occasion sentences they have the same stimulus meaning for him at *t* and he would assent to 'All *F*s are *G*s and vice versa' if asked at *t*. But we can simplify this definition, by strengthening the latter part to make it assure the former part. Instead of just saying he would assent to 'All *F*s are *G*s and vice versa' as things stand at *t*, we can say he would still assent to it, if to anything, following any stimulation that might be imposed at *t*. (The 'if to anything' accommo-

⁸ On this theme see further §§ 15, 16, 19, 20, 24.

dates shock.) This strengthened condition assures that '*F*' and '*G*' will also agree in stimulus meaning as occasion sentences; for, if each stimulation would leave the subject prepared to assent to 'All *F*s are *G*s and vice versa' if to anything, then none would prompt him to assent to or dissent from one of '*F*' and '*G*' and not the other.⁴

For reasons evident in § 14, I call a sentence *stimulus-analytic* for a subject if he would assent to it, or nothing, after every stimulation (within the modulus). Our condition of stimulus synonymy of '*F*' and '*G*' as general terms then reduces to stimulus analyticity of 'All *F*s are *G*s and vice versa'. This condition has its parallel for singular terms, represented by '*a*' and '*b*'; viz., stimulus-analyticity of '*a* = *b*'. But note that our formulations apply only to English and to languages whose translations of 'all', 'are', and '=' are somehow settled in advance. This limitation is to be expected in notions relating to terms.

Our simplification of the definition of term synonymy extends it to all terms, regardless of whether their objects are such that we could reasonably use the terms as occasion sentences. We must not conclude, from seeming appropriateness of the definition as applied to terms like 'rabbit', 'bachelor', and 'buffalo nickel', that it is as appropriate to the wider domain. However, let us leave that question and think further about the narrower domain.

Our version of synonymy makes the terms 'Indian nickel' and 'buffalo nickel' synonymous for the expert of § 11, and not for the novice. It is open to criticism, from intuitive preconceptions, for its equating of terms whose coextensiveness the subject has learned by exploration and experiment and not merely by encompassing their "meanings." Such, then, is the concept of stimulus synonymy of terms that comes out of stimulus synonymy of occasion sentences for individual speakers. We can still socialize the concept and so cut out the effects of idiosyncratic information, as we did for occasion sentences at the end of § 11: we can count just those terms as socially stimulus-synonymous that come out stimulus-synonymous for each individual speaker almost without exception. Socially, 'bachelor' and 'unmarried man' remain stimulus-synonymous while 'Indian nickel' and 'buffalo nickel' do not.

⁴ Incoherent behavior is possible, but there is a limit to the bizarreness of exceptions worth allowing for in these behavioral formulations.

We welcome this consequence of socializing our concept of stimulus synonymy because our intuitive semantics⁵ rates 'bachelor' and 'unmarried man' as synonymous, and probably 'Indian nickel' and 'buffalo nickel' not. But now what can have been the cause of those intuitive ratings themselves? Not, I think, any close analogue, however unconscious, of our present construction: not an implicit sociological guess that under extraordinary stimulation most people would hold 'bachelor' and 'unmarried man' coextensive while many would let 'Indian nickel' and 'buffalo nickel' diverge. A likelier place to seek the cause is in the difference between how we whose mother tongue is English learn 'bachelor' and how we learn 'Indian nickel'. We learn 'bachelor' by learning appropriate associations of words with words, and 'Indian nickel' by learning directly to associate the term with sample objects.⁶ It is the difference, so central to Russell's philosophy, between description and acquaintance. It is kept before us in synchronic behavior as a difference between the non-observational occasion sentences, with their random variation in stimulus meaning from speaker to speaker, and observation sentences with their socially uniform stimulus meanings. (Cf. § 10.) One looks to 'unmarried man' as semantically anchoring 'bachelor' because there is no socially constant stimulus meaning to govern the use of the word; sever its tie with 'unmarried man' and you leave it no very evident social determination, hence no utility in communication.

'Brother', in its synonymy with 'male sibling', is essentially like 'bachelor' in its synonymy with 'unmarried man'. We learn 'brother' (in its accurate adult use) only by verbal connections with sentences about childbirth, and 'sibling' by verbal connections with 'brother' and 'sister'. The occasion sentences 'Brother' and 'Sibling' are non-observational: their stimulus meanings vary over society in as random a fashion as that of 'Bachelor', and it is only the few verbal links that give the terms the fixity needed in communication.

Many terms of systematic theoretical science are of a third sort. They are like 'bachelor' and 'brother' in having no socially constant stimulus meanings to govern their use; indeed such a term is commonly useless in the role of occasion sentence, so that there is no

⁵ See § 9, note 1.

⁶ To be precise about the example, we learn 'nickel' and 'Indian' in direct association with sample objects or likenesses, and then 'Indian nickel' is self-explanatory once we see one.

question of stimulus meaning. Yet they are unlike 'bachelor' and 'brother' in having a more complex network of verbal connections, so that no one tie seems crucial to communication. Thus it is that in theoretical science, unless as recast by semantics enthusiasts, distinctions between synonyms and "factual" equivalences are seldom sensed or claimed. Even the identity historically introduced into mechanics by defining 'momentum' as 'mass times velocity' takes its place in the network of connections on a par with the rest; if a physicist subsequently so revises mechanics that momentum fails to be proportional to velocity, the change will probably be seen as a change of theory and not peculiarly of meaning.⁷ Synonymy intuitions do not emerge here, just because the terms are linked to the rest of language in more ways than words like 'bachelor' are.⁸

§ 13. TRANSLATING LOGICAL CONNECTIVES

In §§ 7 through 11 we accounted for radical translation of occasion sentences, by approximate identification of stimulus meanings. Now there is also a decidedly different domain that lends itself directly to radical translation: that of *truth functions* such as negation, logical conjunction, and alternation. For this purpose the sentences put to the native for assent or dissent may be occasion sentences and standing sentences indifferently. Those that are occasion sentences will have to be accompanied by a prompting stimulation, if assent or dissent is to be elicited; the standing sentences, on the other hand, can be put without props. Now by reference to assent and dissent we can state semantic criteria for truth functions; i.e., criteria for determining whether a given native idiom is to be construed as expressing the truth function in question. The semantic criterion of negation is that it turns any short sentence to which one will assent into a sentence from which one will dissent, and vice versa. That of conjunction is that it produces compounds to which (so long as the component sentences are short)

⁷ See the last section of my "Carnap and logical truth."

⁸ Putnam in "The analytic and the synthetic" has offered an illuminating account of the synonymy intuition in terms of a contrast between terms that connote clusters of traits and terms that do not. My account fits with his and perhaps adds to the explanation. His cases of clustering correspond to my observational terms such as 'Indian nickel' and theoretical terms such as 'momentum', as against 'bachelor'.

one is prepared to assent always and only when one is prepared to assent to each component. That of alternation is similar with assent changed twice to dissent.

The point about short components is merely, as in § 11, that when they are long the subject may get mixed up. Identification of a native idiom as negation, or conjunction, or alternation, is not to be ruled out in view of a subject's deviation from our semantic criteria when the deviation is due merely to confusion. No limit is imposed on the lengths of the component sentences to which negation, conjunction, or alternation may be applied; it is just that the test cases for first spotting such constructions in a strange language are cases with short components.

When we find that a native construction fulfills one or another of these three semantic criteria, we can ask no more toward an understanding of it. Incidentally we can then translate the idiom into English as 'not', 'and', or 'or' as the case may be, but only subject to sundry humdrum provisos; for it is well known that these three English words do not represent negation, conjunction, and alternation exactly and unambiguously.

Any construction for compounding sentences from sentences is counted in logic as expressing a truth function if it fulfills this condition: the compound has a unique truth value (truth or falsity) for each assignment of truth values to the components. Semantic criteria can obviously be stated for all truth functions along the lines already followed for negation, conjunction, and alternation.

This approach ill accords with a doctrine of "prelogical mentality." To take the extreme case, let us suppose that certain natives are said to accept as true certain sentences translatable in the form '*p* and not *p*'. Now this claim is absurd under our semantic criteria. And, not to be dogmatic about them, what criteria might one prefer? Wanton translation can make natives sound as queer as one pleases. Better translation imposes our logic upon them, and would beg the question of prelogicality if there were a question to beg.¹

¹ Malinowski, pp. 68 ff., spared his islanders the imputation of prelogicality by so varying his translations of terms, from occurrence to occurrence, as to sidestep contradiction. Leach, p. 130, protested, but no clear criterion emerged. It is understandable that the further alternative of blaming the translation of conjunctions, copulas, or other logical particles is nowhere considered; for any considerable complexity on the part of the English correlates of such words would of course present the working translator with forbidding practical

Consider, for that matter, the Spaniard with his 'No hay nada.' Lovers of paradox may represent him as flouting the law of double negation. Soberer translators may reckon 'no' and 'nada,' in this context, as halves of one negative.

That fair translation preserves logical laws is implicit in practice even where, to speak paradoxically, no foreign language is involved. Thus when to our querying of an English sentence an English speaker answers 'Yes and no', we assume that the queried sentence is meant differently in the affirmation and negation; this rather than that he would be so silly as to affirm and deny the same thing. Again, when someone espouses a logic whose laws are ostensibly contrary to our own, we are ready to speculate that he is just giving some familiar old vocables ('and', 'or', 'not', 'all', etc.) new meanings. This talk of meaning is intuitive, uncritical, and undefined, but it is a piece with translation; what it registers is our reluctance under such circumstances to "translate" the speaker's English into our English by the normal tacit method of homophonic translation.

Or consider the familiar remark that even the most audacious system-builder is bound by the law of contradiction. How is he really bound? If he were to accept contradiction, he would so readjust his logical laws as to insure distinctions of some sort; for the classical laws yield all sentences as consequences of any contradiction. But then we would proceed to reconstrue his heroically novel logic as a non-contradictory logic, perhaps even as familiar logic, in perverse notation.

The maxim of translation underlying all this is that assertions startlingly false on the face of them are likely to turn on hidden differences of language. This maxim is strong enough in all of us to swerve us even from the homophonic method that is so fundamental to the very acquisition and use of one's mother tongue.

The common sense behind the maxim is that one's interlocutor's silliness, beyond a certain point, is less likely than bad translation—or, in the domestic case, linguistic divergence.² Another account of the matter, as it touches logical laws in the domestic case, is as follows. —Eventually Levy-Bruhl, pp. 130 f., gave up his original doctrine of prelogical mentality; but the considerations that operated are not easy to relate to the present ones.

² Cf. Wilson's principle of charity: "We select as designatum that individual which will make the largest possible number of . . . statements true" (Wilson, "Substances without subtrata").

lows. The logical particles 'and', 'all', etc. are learned only from sentential contexts. Dropping a logical law means a devastatingly widespread unfixing of truth values of contexts of the particles concerned, leaving no fixity to rely on in using those particles. In short, their meanings are gone; new ones may be supplied. What prompts a sense of meaning-involvement here is thus at bottom the same as in the case of 'bachelor' and 'unmarried man' (§ 12).

Let us now resume our reflections on logic under radical translation. We have settled a people's logical laws completely, so far as the truth-functional part of logic goes, once we have fixed our translations by the above semantic criteria. Truths of this part of logic are called *tautologies*: the truth-functional compounds that are true by truth-functional structure alone. There is a familiar tabular routine for determining, for sentences in which the truth functions are however immoderately iterated and superimposed, just what assignments of truth values to the ultimate component sentences will make the whole compound true; and the tautologies are the compounds that come out true under all assignments.

But the truth functions and tautologies are only the simplest of the logical functions and logical truths. Can we perhaps do better? The logical functions that most naturally next suggest themselves are the categoricals, traditionally designated A, E, I, and O, and commonly construed in English by the constructions 'all are' ('All rabbits are timid'), 'none are', 'some are', 'some are not'. A semantic criterion for A perhaps suggests itself as follows: the compound commands assent (from a given speaker) if and only if the affirmative stimulus meaning (for him) of the first component is a subclass of the affirmative stimulus meaning of the second component and the negative stimulus meanings are conversely related. How to vary this for E, I, and O is obvious enough, except that the whole idea is wrong in view of § 12. Thus take A. All Indian nickels are buffalo nickels, and even are believed by the novice of § 12 to be buffalo nickels, but still the affirmative stimulus meaning of 'Indian nickel', for our novice anyway, has stimulus patterns in it that are not in the affirmative stimulus meaning of 'Buffalo nickel'. On this score the suggested semantic criterion is at odds with 'All Fs are Gs' in that it goes beyond extension. And it has a yet more serious failing of the opposite kind; for, whereas rabbit stages are not rabbits, we saw in § 12 that in point of stimulus meaning there is no distinction.

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The difficulty is fundamental. The categoricals depend for their truth on the objects, however external and however inferential, of which the component terms are true; and what those objects are is not uniquely determined by stimulus meanings. Indeed the categoricals, like plural endings and identity, are part of our own special apparatus of objective reference, whereas stimulus meaning is, to repeat § 12, common coin. Of what we think of as logic, the truth-functional part is the only part the recognition of which, in a foreign language, we seem to be able to pin down to behavioral criteria.

The condition that was seen to be inadequate as a semantic condition for the A copula does still determine a copula. Let me write 'pars' for this copula. Its usage is to be such that a compound of the form '*... pars ...*', formed of two occasion sentences S_1 and S_2 in that order, is a standing sentence and is to command assent of just the speakers for whom the affirmative stimulus meaning of S_1 is a subclass of that of S_2 and conversely for the negative. Thus, if we think of S_1 and S_2 as general terms—a detail of translation left open by stimulus meaning—then '*F pars G*' says approximately that every *F* is part of the fusion (§ 12) of the *G*s; and if we think of S_1 and S_2 as singular terms, '*a pars b*' says approximately that *a* is part of *b*. The theory of the part relation, called mereology by Lesniewski and the calculus of individuals by Goodman and Leonard,³ is thus more amenable to radical semantic criteria than is the logic of the syllogism. But we must give full weight to the word 'approximately', twice used just now; the correspondence is rather poor, because, as remarked two paragraphs back, our semantic criterion makes demands beyond extension.

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By its etymology, 'synonymous' applies to names. Though in use the term is intended simply to impute sameness of meaning, an effect of its etymology is seen in a tendency to invoke some other word, 'equivalent' or 'equipollent', for cases where both of the compared expressions are (unlike 'bachelor') verbally complex. My use of 'synonymous' is not thus restricted; I intend the word to carry the full generality of 'same in meaning', whatever that is. Indeed I

³ See Goodman, *Structure of Appearance*, pp. 42 ff., and further references therein.

have made no essential use of a distinction between word and phrase. Even the first object of translation, say 'Gavagai', may or may not in the end be parsed as a string of several words, depending on one's eventual choice of analytical hypotheses (§§ 15, 16).

Taking this minor liberalization hereafter for granted, we still must distinguish between a broad and a narrow type of synonymy, or sameness of meaning, as applied to sentences. The broad one may be formulated in intuitive terms thus: the two sentences command assent concomitantly and dissent concomitantly, and this concomitance is due strictly to word usage rather than to how things happen in the world. One usually hears the matter described in terms rather of truth values than of assent and dissent; but I warp it over to the latter terms in order to maximize chances of making sense of the relation on the basis of verbal behavior.

For some purposes a narrower sort of synonymy of sentences is wanted, such as what Carnap calls intensional isomorphism, involving certain part-by-part correspondences of the sentences concerned. (Cf. § 42.) But such variant versions can be defined on the basis of the broader one. Synonymy of parts is defined by appeal to analogy of roles in synonymous wholes; then synonymy in the narrower sense is defined for the wholes by appeal to synonymy of homologous parts. So let us concentrate on the broader and more basic notion of sentence synonymy.

By talking in terms of assent and dissent here instead of in terms of truth values we introduce this difficulty: assent and dissent can be influenced by confusion due to a sentence's length and complexity. But this difficulty can be accommodated in the way sketched in § 11. Also it would be automatically taken care of under the program, just now mentioned, of deriving a relation of synonymy of sentence fragments and thence constructing a reformed synonymy of relation for wholes. Let us pass over these points, for there is a more basic problem.

When the sentences are occasion sentences, the envisaged notion of synonymy is pretty well realized in intrasubjective stimulus synonymy, especially as socialized. For we can argue that only verbal habit can plausibly account for concomitant variation of two occasion sentences, in point of assent and dissent, over the whole gamut of possible stimulations. There are still the unscreened effects of community-wide collateral information, but there is no evident reason not to count such information simply as a determi-

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nant of the verbal habit (§ 9). When the sentences are standing sentences which, like 'The *Times* has come', closely resemble occasion sentences in the variability of assent and dissent, stimulus synonymy still does pretty well.

But the less variable the standing sentences are in point of assent and dissent, the sparser their stimulus meanings will be and hence the more poorly stimulus synonymy will approximate to synonymy of the envisaged sort. For, however sparse its stimulus meaning, a sentence retains its connections with other sentences and plays its distinctive part in theories. The sparseness of its stimulus meaning is no sparseness of meaning intuitively speaking, but has the effect that stimulus meaning fails to do the sentence much justice.

By lengthening the modulus of stimulation we can enrich the stimulus meanings and so tighten the relation of stimulus synonymy; for, the longer the stimulations the better their chance of influencing assent and dissent. However, matters get out of hand when the modulus is excessive. Thus consider stimulus synonymy modulo a month. To say that two sentences are now so related is to say that any and every pattern of month-long stimulation, if begun now and terminated next month with a querying of the two sentences, would elicit the same verdict on both. The trouble is that there is no telling what to expect under fairly fantastic stimulation sequences of such duration. The subject might revise his theories in unforeseeable ways that would be claimed to change meanings of words. There is no reason to expect the concomitances of sentences under such circumstances to reflect present sameness of meaning in any intuitively plausible sense. Lengthening the modulus enriches stimulus meanings and tightens stimulus synonymy only as it diminishes scrutability of stimulus synonyms.

Stimulus synonymy, on an optimum modulus, is an approximation to what philosophers loosely call sameness of confirming experiences and of disconfirming experiences. It is an approximation to what it might mean "to speak of two statements as standing in the same germaneness-relation to the same particular experiences."¹ Where standing sentences are of highly unoccasional type, the inadequacy of stimulus synonymy to synonymy intuitively so-called is shared by the vaguer formulations just now noted. And it is shared by the proposal of Perkins and Singer, viz., that we com-

¹ Grice and Strawson, p. 156.

pare sentences for synonymy by putting them to our informant for verification and seeing whether he proceeds similarly in both cases.² **The trouble lies in the interconnections of sentences.** If the business of a sentence can be exhausted by an account of the experiences that would confirm or disconfirm it as an isolated sentence in its own right, then the sentence is substantially an occasion sentence. The significant trait of other sentences is that experience is relevant to them largely in indirect ways, through the mediation of associated sentences. Alternatives emerge: **experiences call for changing a theory, but do not indicate just where and how.** Any of various systematic changes can accommodate the recalcitrant datum, and all the sentences affected by any of those possible alternative readjustments would evidently have to count as disconfirmed by that datum indiscriminately or not at all. Yet the sentences can be quite unlike with respect to content, intuitively speaking, or role in the containing theory.

Grice and Strawson try (*loc. cit.*) to meet this difficulty by defining S_1 and S_2 as synonymous when, for every assumption as to the truth values of other sentences, the same experiences confirm (and disconfirm) S_1 on that assumption as confirm (and disconfirm) S_2 on that assumption. Now instead of 'every assumption as to the truth values of other sentences' we can as well say simply 'every sentence S '; for S can be the logical conjunction of those "other sentences" in question or their negations. So S_1 and S_2 are defined to be synonymous when, for every S , the same experiences confirm (and disconfirm) S_1 on the hypothesis S as confirm (and disconfirm) S_2 on S . The notion of confirmatory and disconfirmatory experiences had a behavioral approximation in our notion of stimulus meaning; but can we relativize it thus to a hypothesis S ? I think we can, for confirmation or disconfirmation of S_1 on S is presumably confirmation or disconfirmation of the conditional sentence consisting of S as antecedent and S_1 as consequent. Then the proposed definition of synonymy becomes: S_1 and S_2 are synonymous if for every S the conditional compound of S and S_1 and that of S and S_2 are stimulus-synonymous. But now it is apparent that the definition fails to provide a tighter relation between S_1 and S_2 than stimulus synonymy. For, if S_1 and S_2 are stimulus-synonymous than *a fortiori* the conditionals are too.

² See Perkins and Singer. It is significant that their examples are occasion sentences.

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A variant suggestion would be to define S_1 and S_2 as synonymous when, for every S , the logical conjunction of S and S_1 and that of S and S_2 are stimulus-synonymous. But this is yet more readily seen not to provide a tighter relation.

If either of these ventures had succeeded, the synonymy yielded would still have been strictly intralinguistic; for the auxiliary S , belonging to one language, gets joined to both S_1 and S_2 . But the language would not have to be our own. For, by § 13, conjunction is translatable; and so is the conditional, if we take it in the material sense ('Not (p and not q)').

The general relation of intrasubjective sentence synonymy thus unsuccessfully sought is interdefinable with another elusive notion of intuitive philosophical semantics: that of an *analytic* sentence. Here the intuitive notion is that the sentence is true purely by meaning and independently of collateral information: thus 'No bachelor is married', 'Pigs are pigs', and, by some accounts, ' $2 + 2 = 4$ '.³ The interdefinitions run thus: sentences are synonymous if and only if their biconditional (formed by joining them with 'if and only if') is analytic, and a sentence is analytic if and only if synonymous with self-conditionals ('If p then p ').

As synonymy of sentences is related to analyticity, so stimulus synonymy of sentences is related to stimulus analyticity (§ 12).

³ There is a small confusion that I should like to take this opportunity to resolve, though it lies aside from the main course of the present reflections. Those who talk confidently of analyticity have been known to disagree on the analyticity of the truths of arithmetic, but are about unanimous on that of the truths of logic. We who are less clear on the notion of analyticity may therefore seize upon the generally conceded analyticity of the truths of logic as a partial extensional clarification of analyticity; but to do this is not to embrace the analyticity of the truths of logic as an antecedently intelligible doctrine. I have been misunderstood on this score by Gewirth, p. 406 n., and others. Contrast my "Truth by convention." Not that all criticisms of my remarks on truths of logic turn on this misunderstanding. Pap's criticism in *Semantics and Necessary Truth*, p. 237 n., is another matter, and was answered anticipatorily in my "Carnap and logical truth," end of § IX (to which he had no access). Strawson's criticism in "Propositions, concepts, and logical truths" is another still, and an interesting one, which I cannot claim to have answered anywhere. — Speaking of "Truth by convention," I would remark that my much-cited definition of logical truth therein was meant only as an improved exposition of a long-current idea. So I was not taken aback at Bar-Hillel's finding the idea in Bolzano; I was, though, at recently uncovering an anticipation of my specific exposition, in Ajdukiewicz.

Philosophical tradition hints of three nested categories of firm truths: the analytic, the *a priori*, and the necessary. Whether the first exhausts the second, and the second the third, are traditional matters of disagreement, though none of the three has traditionally been defined in terms of detectable features of verbal behavior. Pressed nowadays for such a clarification, some who are content to take the three as identical have responded in this vein: the analytic sentences are those that we are prepared to affirm come what may. This comes to naught unless we independently circumscribe the 'what may'. Thus one may object that we would not adhere to 'No bachelor is married' if we found a married bachelor; and how are we to disallow his example without appealing to the very notion of analyticity we are trying to define? One way is to take 'come what may' as 'come what stimulation (§ 8) may'; and this gives virtually the definition (§ 12) of stimulus analyticity.⁴

We improved stimulus synonymy a bit by socializing it. We can do the same for analyticity, calling socially stimulus-analytic just the sentences that are stimulus-analytic for almost everybody. But analyticity in even this improved sense will apply as well to 'There have been black dogs' as to '2 + 2 = 4' and 'No bachelor is married'. Let us face it: our socialized stimulus synonymy and stimulus analyticity are still not behavioristic reconstructions of intuitive semantics, but only a behavioristic ersatz.

At the end of § 12 we speculated on what makes for the intuition of synonymy of terms. Similar considerations apply to intuitions of sentence synonymy and analyticity. Such an intuition figures in the case of analyticity despite the technical sound of the word; sentences like 'No unmarried man is married', 'No bachelor is married', and '2 + 2 = 4' have a feel that everyone appreciates. Moreover the notion of "assent come what may" gives no fair hint of the intuition involved. One's reaction to denials of sentences typically felt as analytic has more in it of one's reaction to ungrasped foreign sentences.⁵ Where the sentence concerned is a law of logic, something of the ground of this reaction was discerned in § 13; dropping a logical law disrupts a pattern on which the communicative use of

⁴ I am indebted to Davidson for the concept of stimulus analyticity, as well as for this observation concerning it. Mates also may be said to have taken a step in somewhat this direction, in his proposal of contrary-to-fact questionnaires ("Analytic sentences," p. 532).

⁵ Cf. Grice and Strawson, pp. 150 f.

a logical particle heavily depends. Much the same applies to '2 + 2 = 4', and even to 'The parts of the parts of a thing are parts of the thing'. The key words here have countless further contexts to anchor their usage, but somehow we feel that if our interlocutor will not agree with us on these platitudes there is no depending on him in most of the further contexts containing the terms in question.

Examples like 'No bachelor is married' rate as analytic both directly on the vague count just now conjectured and by virtue of coming from logical truths by synonymy substitution.

If the mechanism of analyticity intuitions is substantially as I have vaguely suggested, they will in general tend to set in where bewilderment sets in as to what the man who denies the sentence can be talking about. This effect can be gradual and also cumulative.⁶ The intuitions are blameless in their way, but it would be a mistake to look to them for a sweeping epistemological dichotomy between analytic truths as by-products of language and synthetic truths as reports on the world. I suspect that the notion of such a dichotomy only encourages confused impressions of how language relates to the world.⁷ Stimulus analyticity, our strictly vegetarian imitation, is of course not here in question.

⁶ Apostel and his associates have explored this matter experimentally by asking subjects to classify chosen sentences, with and without the guidance of prior headings. Their findings suggest a gradualism of intuitive analyticity. For earlier experimentation on synonymy intuitions see Neess. On gradualism see also Goodman, "On likeness of meaning," and White, "The analytic and the synthetic."

⁷ The notion, reminiscent of Kant, is often uncritically assumed in modern epistemological writing. Sometimes it has been given a semblance of foundation in terms of "semantical rules" or "meaning postulates" (Carnap, *Meaning and Necessity*, especially 2d ed.), but these devices only assume the notion in a disguised form. (See my "Two dogmas of empiricism" and "Carnap and logical truth.") The notion has long had its doubters; Duhem's views in 1906, pp. 303, 328, 347 f., are scarcely congenial to it, and idealists have expressly scouted it. (See Gewirth, p. 369, for references.) My misgivings over the notion came out in a limited way in "Truth by convention" (1936), and figured increasingly in my lectures at Harvard. Tarski and I long argued the point with Carnap there in 1939-40. Soon White was pursuing the matter with Goodman and me in triangular correspondence. Essays questioning the distinction issued from a number of pens, sometimes independently of the Harvard discussions; for instance Reid, 1943. Carnap and White mentioned my position in their 1950 papers, but my published allusions to it were slight (1940, p. 55; 1943, p. 120; 1944, Intro.; 1947, pp. 44 f.) until in 1950 I was invited to address the American Philosophical Association on the issue, and so wrote

§ 15. ANALYTICAL HYPOTHESES

We have had our linguist observing native utterances and their circumstances passively, to begin with, and then selectively querying native sentences for assent and dissent under varying circumstances. Let us sum up the possible yield of such methods. (1) **Observation sentences can be translated.** There is uncertainty, but the situation is the normal inductive one. (2) **Truth functions can be translated.** (3) **Stimulus-analytic sentences can be recognized.** So can the sentences of the opposite type, the "stimulus-contradictory" sentences, which command irreversible dissent. (4) Questions of intrasubjective stimulus synonymy of native occasion sentences even of non-observational kind can be settled if raised, but the sentences cannot be translated.

And how does the linguist pass these bounds? In broad outline as follows. He segments heard utterances into conveniently short recurrent parts, and thus compiles a list of native "words." Various of these he hypothetically equates to English words and phrases, in such a way as to conform to (1)-(4). Such are his *analytical hypotheses*, as I call them. Their conformity to (1)-(4) is ideally as follows. The sentence translations derivable from the analytical hypotheses are to include those already established under (1); they are to fit the prior translation of truth functions, as of (2); they are to carry sentences that are stimulus-analytic or stimulus-contradictory, according to (3), into English sentences that are likewise stimulus-analytic or stimulus-contradictory; and they are to carry sentence pairs that are stimulus-synonymous, according to (4), into English sentences that are likewise stimulus-synonymous. The analytical hypotheses are begun, however tentatively, long before the work of (1)-(4) is finished, and they help guide the choice of examples for investigation under (1)-(4). This point is essential to (4), since without indirect hints through analytical hypotheses there is virtually no telling what pairs of non-observational sentences to try for intrasubjective stimulus synonymy.

"Two dogmas." The ensuing controversy has run to many articles and several books. Besides items mentioned in notes of this section and §§ 12, 42, 43, see particularly Pasch (Part I), White (*Toward Reunion in Philosophy*, pp. 139-163), and Bennett. The title of "Two dogmas," by the way, has proved unfortunate in its unintended but very real suggestion that there is no empiricism without the dogmas in question; cf. e.g. Hofstadter, pp. 410, 413.

§ 15

ANALYTICAL HYPOTHESES

Our recipe is overschematic. If the analytical hypotheses give some English platitude as translation of some native standing sentence, there would be encouragement in finding that the latter also commands general and unreflective assent among natives, even if neither is quite stimulus-analytic. Degrees of approximation to stimulus-analyticity, as well as degrees of observability, would be allowed for in a truer account. And anyway the analytical hypotheses are not strictly required to conform to (1)-(4) with respect to quite every example; the nearer the analytical hypotheses, the more tolerance.

Tolerance is bound to have been exercised if a native sentence, believed by the whole community with a firmness that no stimulus pattern of reasonable duration would suffice to shake, is translated as 'All rabbits are men reincarnate'. To translate a stimulus-analytic native sentence thus into an English sentence that is not stimulus-analytic is to invoke translator's license. I think this account gives such a translation quite the proper air: that of a bold departure, to be adopted only if its avoidance would seem to call for much more complicated analytical hypotheses. For certainly, the more absurd or exotic the beliefs imputed to a people, the more suspicious we are entitled to be of the translations; the myth of the prelogical people marks only the extreme.¹ For translation theory, banal messages are the breath of life.

It may occur to the reader to try to derive from stimulus analyticity a finer analyticity concept by screening out sentences such as the native one about reincarnation, using this criterion: through indirect considerations they get translated into sentences of another language that are not stimulus-analytic. However, this criterion is illusory because of its relativity to analytical hypotheses, which, as stressed in succeeding pages, are not determinate functions of linguistic behavior.

Let us now get back to the analytical hypotheses for a more leisurely consideration of their form and content. They are not in general held to equational form. There is no need to insist that the native word be equated outright to any one English word or phrase. Certain contexts may be specified in which the word is to be translated one way and others in which the word is to be translated in another way. The equational form may be overlaid with

¹ See § 13 on this myth and the principle of charity.

supplementary semantical instructions *ad libitum*. Since there is no general positional correspondence between the words and phrases of one language and their translations in another, some analytical hypotheses will be needed also to explain syntactical constructions. These are usually described with help of auxiliary terms for various classes of native words and phrases. Taken together, the analytical hypotheses and auxiliary definitions constitute the linguist's jungle-to-English dictionary and grammar. The form they are given is immaterial because their purpose is not translation of words or constructions but translation of coherent discourse; single words and constructions come up for attention only as means to that end.

Nevertheless there is reason to draw particular attention to the simple form of analytical hypothesis which equates a native word or construction to a hypothetical English equivalent. For hypotheses need thinking up, and the typical case of thinking up is the case where the linguist apprehends a parallelism in function between some component fragment of a translated whole native sentence and some component word of the translation of the sentence. Only in some such way can we account for anyone's ever thinking to translate a native locution radically into English as a plural ending, or as the identity predicate '=', or as a categorical copula, or as any other part of our domestic apparatus of objective reference. It is only by such outright projection of prior linguistic habits that the linguist can find general terms in the native language at all, or, having found them, match them with his own; stimulus meanings never suffice to determine even what words are terms, if any, much less what terms are coextensive.

The method of analytical hypotheses is a way of catapulting oneself into the jungle language by the momentum of the home language. It is a way of grafting exotic shoots on to the old familiar bush—to recur to the concluding metaphor of §2—until only the exotic meets the eye. From the point of view of a theory of translational meaning the most notable thing about the analytical hypotheses is that they exceed anything implicit in any native's dispositions to speech behavior. By bringing out analogies between sentences that have yielded to translation and others they extend the working limits of translation beyond where independent evidence can exist.

Not that (1)-(4) themselves cover all available evidence. For

remember that we stated those only with reference to a linguist whose gathering of data proceeded by querying native sentences for assent and dissent under varying circumstances. A linguist can broaden his base, as remarked in § 11, by becoming bilingual. Point (1) is thereupon extended to this: (1') All occasion sentences can be translated. Point (4) drops as superfluous. But even our bilingual, when he brings off translations not allowed for under (1')-(3), must do so by essentially the method of analytical hypotheses, however unconscious. Thus suppose, unrealistically to begin with, that in learning the native language he had been able to simulate the infantile situation to the extent of keeping his past knowledge of languages out of account. Then, when as a bilingual he finally turns to his project of a jungle-to-English manual, he will have to project analytical hypotheses much as if his English personality were the linguist and his jungle personality the informant; the differences are just that he can introspect his experiments instead of staging them, that he has his notable inside track on non-observational occasion sentences, and that he will tend to feel his analytical hypotheses as obvious analogies when he is aware of them at all. Now of course the truth is that he would not have strictly simulated the infantile situation in learning the native language, but would have helped himself with analytical hypotheses all along the way; thus the elements of the situation would in practice be pretty inextricably scrambled. What with this circumstance and the fugitive nature of introspective method, we have been better off theorizing about meaning from the more primitive paradigm: that of the linguist who deals observably with the native informant as live collaborator rather than first ingesting him.

Whatever the details of its expository devices of word translation and syntactical paradigm, the linguist's finished jungle-to-English manual has as its net yield an infinite *semantic correlation* of sentences: the implicit specification of an English sentence, or various roughly interchangeable English sentences, for every one of the infinitely many possible jungle sentences. Most of the semantic correlation is supported only by analytical hypotheses, in their extension beyond the zone where independent evidence for translation is possible. That those unverifiable translations proceed without mishap must not be taken as pragmatic evidence of good lexicography, for mishap is impossible.

Thus let us recall § 12, where we saw that stimulus meaning was

incapable of deciding among 'rabbit', 'rabbit stage', and various other terms as translations of 'gavagai'. If by analytical hypothesis we take 'are the same' as translation of some construction in the jungle language, we may proceed on that basis to question our informant about sameness of gavagais from occasion to occasion and so conclude that gavagais are rabbits and not stages. But if instead we take 'are stages of the same animal' as translation of that jungle construction, we will conclude from the same subsequent questioning of our informant that gavagais are rabbit stages. Both analytical hypotheses may be presumed possible. Both could doubtless be accommodated by compensatory variations in analytical hypotheses concerning other locutions, so as to conform equally to all independently discoverable translations of whole sentences and indeed all speech dispositions of all speakers concerned. And yet countless native sentences admitting no independent check, not falling under (1')-(3), may be expected to receive radically unlike and incompatible English renderings under the two systems.

There is an obstacle to offering an actual example of two such rival systems of analytical hypotheses. Known languages are known through unique systems of analytical hypotheses established in tradition or painfully arrived at by unique skilled linguists. To devise a contrasting system would require an entire duplicate enterprise of translation, unaided even by the usual hints from interpreters. Yet one has only to reflect on the nature of possible data and methods to appreciate the indeterminacy. Sentences translatable outright, translatable by independent evidence of stimulatory occasions, are sparse and must woefully under-determine the analytical hypotheses on which the translation of all further sentences depends. To project such hypotheses beyond the independently translatable sentences at all is in effect to impute our sense of linguistic analogy unverifiably to the native mind. Nor would the dictates even of our own sense of analogy tend to any intrinsic uniqueness; using what first comes to mind engenders an air of determinacy through freedom reign. There can be no doubt that rival systems of analytical hypotheses can fit the totality of speech behavior to perfection, and can fit the totality of dispositions to speech behavior as well, and still specify mutually incompatible translations of countless sentences insusceptible of independent control.

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Thus the analytical hypotheses, and the grand synthetic one that they add up to, are only in an incomplete sense hypotheses. Contrast the case of translation of the occasion sentence 'Gavagai' by similarity of stimulus meaning. This is a genuine hypothesis from sample observations, though possibly wrong. 'Gavagai' and 'There's a rabbit' have stimulus meanings for the two speakers, and these are roughly the same or significantly different, whether we guess right or not. On the other hand no such sense is made of the typical analytical hypothesis. The point is not that we cannot be sure whether the analytical hypothesis is right, but that there is not even, as there was in the case of 'Gavagai', an objective matter to be right or wrong about.

There are at least seven causes of failure to appreciate this point. One is that analytical hypotheses are confirmed in the field. Now this simply means that supplementary cases of the sorts summed up under (1)-(4) or (1')-(3) of § 15 are gathered after the analytical hypotheses have been framed. The unverifiable consequences I mean are translations not covered by (1)-(4) or even (1')-(3). They can be defended only through the analytical hypotheses, now and forever.

Another of the causes of failure to appreciate the point is confusion of it with the more superficial reflection that uniqueness of grammatical systematization is not to be expected. Obviously the grammatical theories can differ in word segmentations, in parts of speech, in constructions, and perforce then in dictionaries of translation, and still have identical net outputs in the way of whole sentences and even of English sentence translations. But I am talking of difference in net output.

A third cause of failure to appreciate the point is confusion of it with the platitude that uniqueness of translation is absurd. The indeterminacy that I mean is more radical. It is that rival systems of analytical hypotheses can conform to all speech dispositions within each of the languages concerned and yet dictate, in countless cases, utterly disparate translations; not mere mutual paraphrases, but translations each of which would be excluded by the other system of translation. Two such translations might even be patently con-

trary in truth value, provided there is no stimulation that would encourage assent to either.

A fourth and major cause of failure to appreciate the point is a stubborn feeling that a true bilingual surely is in a position to make uniquely right correlations of sentences generally between his languages. This feeling is fostered by an uncritical mentalistic theory of ideas: each sentence and its admissible translations express an identical idea in the bilingual's mind. The feeling can also survive rejection of the ideas: one can protest still that the sentence and its translations all correspond to some identical even though unknown neural condition in the bilingual. Now let us grant that; it is only to say that the bilingual has his own private semantic correlation—in effect his private implicit system of analytical hypotheses—and that it is somehow in his nerves. My point remains; for my point is then that another bilingual could have a semantic correlation incompatible with the first bilingual's without deviating from the first bilingual in his speech dispositions within either language, except in his dispositions to translate.

A fifth cause is that linguists adhere to implicit supplementary canons that help to limit their choice of analytical hypotheses. For example, if a question were to arise over equating a short native locution to 'rabbit' and a long one to 'rabbit part' or vice versa (§ 12), they would favor the former course, arguing that the more conspicuously segregated wholes are likelier to bear the simpler term. Such an implicit canon is all very well, unless mistaken for a substantive law of speech behavior.

A sixth cause is that a few early analytical hypotheses carry the linguist so far. Once he has hypotheses covering identity, the copula, and associated particles, he can translate terms by stimulus synonymy of sentences. A few further hypotheses can create a medium in which to challenge native statements and elicit argument, or even to ask about intuitive synonymy. Abundant new structural data are then forthcoming, and one fails to note the free prior decisions to which these data owe their significance.

A seventh cause is that in framing his analytical hypotheses the linguist is subject to practical constraints. For he is not, in his finitude, free to assign English sentences to the infinitude of jungle ones in just any way whatever that will fit his supporting evidence; he has to assign them in some way that is manageably systematic with respect to a manageably limited set of repeatable speech

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segments. Once he has cut the segments, begun his analytical hypotheses, and devised an auxiliary apparatus of word classes for his formulations, his freedom of subsequent choice is narrowed further still.

The linguist's working segmentation does yet more than narrow the possibilities of analytical hypotheses. It even contributes to setting, for him or the rest of us, the ends of translation. For a premium is put on structural parallels: on correspondence between the parts of the native sentence, as segmented, and the parts of the English translation. Other things being equal, the more literal translation is seen as more literally a translation.¹ A tendency to literal translation is assured anyway, since the purpose of segmentation is to make long translations constructible from short correspondences; but one goes farther and makes of this tendency an objective—and an objective that even varies in detail with the practical segmentation adopted.

Complete radical translation goes on, and analytical hypotheses are indispensable. Nor are they capricious; we have seen in outline how they are supported. May we not then say that in those very ways of thinking up and supporting the analytical hypotheses a sense is after all given to sameness of meaning of the expressions which those hypotheses equate? No. We could claim this only if no two conflicting sets of analytical hypotheses could be tied for first place on all theoretically accessible evidence. The indefinability of synonymy by reference to the methodology of analytical hypotheses is formally the same as the indefinability of truth by reference to scientific method (§ 5). Also the consequences are parallel. Just as we may meaningfully speak of the truth of a sentence only within the terms of some theory or conceptual scheme (cf. § 5), so on the whole we may meaningfully speak of interlinguistic synonymy only within the terms of some particular system of analytical hypotheses.

May we conclude that translational synonymy at its worst is no worse off than truth in physics? To be thus reassured is to misjudge the parallel. In being able to speak of the truth of a sentence only within a more inclusive theory, one is not much hampered; for one is always working within some comfortably inclusive theory, however tentative. Truth is even overtly relative to

¹ Hence Lewis's concept of analytic meaning, and Carnap's of intensional isomorphism. See below, § 42.

language, in that e.g. the form of words 'Brutus killed Caesar' could by coincidence have unrelated uses in two languages; yet this again little hampers one's talk of truth, for one works within some language. In short, the parameters of truth stay conveniently fixed most of the time. Not so the analytical hypotheses that constitute the parameter of translation. We are always ready to wonder about the meaning of a foreigner's remark without reference to any one set of analytical hypotheses, indeed even in the absence of any; yet two sets of analytical hypotheses equally compatible with all linguistic behavior can give contrary answers, unless the remark is of one of the limited sorts that can be translated without recourse to analytical hypotheses.

Something of the true situation verges on visibility when the sentences concerned are extremely theoretical. Thus who would undertake to translate 'Neutrinos lack mass' into the jungle language? If anyone does, we may expect him to coin words or distort the usage of old ones. We may expect him to plead in extension that the natives lack the requisite concepts; also that they know too little physics. And he is right, except for the hint of there being some free-floating, linguistically neutral meaning which we capture, in 'Neutrinos lack mass', and the native cannot.

Containment in the Low German continuum facilitated translation of Frisian into English (§ 7), and containment in a continuum of cultural evolution facilitated translation of Hungarian into English. In facilitating translation these continuities encourage an illusion of subject matter: an illusion that our so readily intertranslatable sentences are diverse verbal embodiments of some intercultural proposition or meaning, when they are better seen as the merest variants of one and the same intracultural verbalism. The discontinuity of radical translation tries our meanings: really sets them over against their verbal embodiments, or, more typically, finds nothing there.

Observation sentences peel nicely; their meanings, stimulus meanings, emerge absolute and free of residual verbal taint. Similarly for occasion sentences more generally, since the linguist can go native. Theoretical sentences such as 'Neutrinos lack mass', or the law of entropy, or the constancy of the speed of light, are at the other extreme. It is of such sentences above all that Wittgenstein's dictum holds true: "Understanding a sentence means understanding

a language."² Such sentences, and countless ones that lie intermediate between the two extremes, lack linguistically neutral meaning.

There is no telling how much of one's success with analytical hypotheses is due to real kinship of outlook on the part of the natives and ourselves, and how much of it is due to linguistic ingenuity or lucky coincidence. I am not sure that it even makes sense to ask. We may alternately wonder at the inscrutability of the native mind and wonder at how very much like us the native is, where in the one case we have merely muffed the best translation and in the other case we have done a more thorough job of reading our own provincial modes into the native's speech.

Thus consider, in contrast, a simple instance where cultural difference does objectively manifest itself in language without intervention of analytical hypotheses. Certain islanders are said to speak of pelicans as their half-brothers.³ One is not of course put off by this obvious shorthand translation of a native word as 'half-brother' rather than in some such more inclusive fashion as 'half-brother or totem associate'. There remains an objective cultural difference apart from that, and it is linguistically reflected as follows: the islanders have a short occasion sentence that commands an islander's assent indiscriminately on presentation of any of his half-brothers or any pelican, and presumably no comparably short one for the case of half-brothers exclusively, whereas English is oppositely endowed. Such contrasts, between peoples' basic or short-sentence partitionings of stimulations, are genuine cultural contrasts objectively describable by reference to stimulus meanings.⁴ Where cultural contrasts begin to be threatened with meaninglessness is rather where they depend on analytical hypotheses. One frequently hears it urged⁵ that deep differences of language carry with them ultimate differences in the way one thinks, or looks upon the world. I would urge that what is most generally

² *Blue and Brown Books*, p. 5. Perhaps the doctrine of indeterminacy of translation will have little air of paradox for readers familiar with Wittgenstein's latter-day remarks on meaning.

³ The example is from Lienhardt, p. 97. His discussion of it accords somewhat with mine.

⁴ A striking example is the comparison of color words in Lenneberg and Roberts, pp. 23-30.

⁵ Thus Cassirer, D. D. Lee, Sapir (Ch. X), Whorf. See further Bedau's review.

involved is indeterminacy of correlation. There is less basis of comparison—less sense in saying what is good translation and what is bad—the farther we get away from sentences with visibly direct conditioning to non-verbal stimuli and the farther we get off home ground.

Our advantage with a compatriot is that with little deviation the automatic or homophonic (§13) hypothesis of translation fills the bill. If we were perverse and ingenious we could scorn that hypothesis and devise other analytical hypotheses that would attribute unimagined views to our compatriot, while conforming to all his dispositions to verbal response to all possible stimulations. Thinking in terms of radical translation of exotic languages has helped make factors vivid, but the main lesson to be derived concerns the empirical slack in our own beliefs. For our own views could be revised into those attributed to the compatriot in the impractical joke imagined; no conflicts with experience could ever supervene, except such as would attend our present sensible views as well. To the same degree that the radical translation of sentences is undetermined by the totality of dispositions to verbal behavior, our own theories and beliefs in general are under-determined by the totality of possible sensory evidence time without end.

It may be protested that when two theories agree thus in point of all possible sensory determinants they are in an important sense not two but one. Certainly such theories are, as wholes, empirically equivalent. If something is affirmed in the one theory and denied in the other, one may argue that the particular form of words affirmed and denied is itself unlike in meaning in the two cases but that the containing theories as wholes have the same net meaning still. Similarly one may protest that two systems of analytical hypotheses are, as wholes, equivalent so long as no verbal behavior makes any difference between them; and, if they offer seemingly discrepant English translations, one may again argue that the apparent conflict is a conflict only of parts seen out of context. Now this account is fair enough, apart from its glibness on the topic of meaning; and it helps to make the principle of indeterminacy of translation less surprising. When two systems of analytical hypotheses fit the totality of verbal dispositions to perfection and yet conflict in their translations of certain sentences, the conflict is precisely a conflict of parts seen without the wholes. The principle of indeterminacy of translation requires notice just because trans-

lation proceeds little by little and sentences are thought of as conveying meanings severally. That it requires notice is plainly illustrated by the almost universal belief that the objective references of terms in radically different languages can be objectively compared.

The indeterminacy of translation has been less generally appreciated than its somewhat protean domestic analogue. In mentalistic philosophy there is the familiar predicament of private worlds. In speculative neurology there is the circumstance that different neural hookups can account for identical verbal behavior. In language learning there is the multiplicity of individual histories capable of issuing in identical verbal behavior. Still one is ready to say of the domestic situation in all positivistic reasonableness that if two speakers match in all dispositions to verbal behavior there is no sense in imagining semantic differences between them. It is ironic that the interlinguistic case is less noticed, for it is just here that the semantic indeterminacy makes clear empirical sense.