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ON THE IRRELEVANCY OF DREAMS
IN THE LIGHT OF THE TRIAL-AND-ERROR THEORY OF
DREAMING

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I

WRITING in 1901, Professor Bergson attributes the commonly noted failure of appropriateness in dreaming thoughts to the lack—on the dreamer's part—of sufficient effort or energy for summoning the correct mental associations. In this sense, he treats the absurdity of dreams as a peculiarity of the relaxed nervous tension of sleep, involving an absence of requisite "force." On the other hand, Dr. Freud, in his theory of dreams (scarcely published when Bergson wrote his essay) emphasizes the presence of a positive influence: that of the Endopsychic Censor, who takes the blame for the droll disguises of meaning in dreams. Freud's idea is that the "distortion" or garbling of our thought in dreams is produced by a sort of censorship which prevents the dreaming consciousness from knowing the mind's thought as it is; hence, the real thought that is in play is kept from being outspoken, as it were. But, we are told by the psycho-analysts of the Vienna school that the repressed thought has a way of "passing the censor" and expressing itself through symbols; these are then supposed to be utterances of the Unconscious, from which the deeper meaning of a dream can be interpreted.

Thus there is presented an antithetical picture: Bergson

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emphasizes the deficiency of a necessary force that should be present in order to bring forward the perfectly relevant idea, and install it in consciousness. On the other hand, Freud dwells especially on the presence in the dream of a positive influence, acting to keep the correct mental image at bay: *i. e.*, to hold it below the threshold of consciousness, where it will not "offend the censor."

What my own inquiries into several thousand dreams tend to show is that neither of these conceptions is fundamental; each author has simply set forth the mechanism of dreaming as he has seen it in a particular class of dreams. This has been done (sometimes in masterly and sometimes in magisterial fashion) by the use of parables and symbols appropriate, less to onirocritics than to the writer's particular business; the one writing as a trenchant philosopher, the other as a practical psychotherapist. No reconciliation can here be attempted. The discrepancies between the two theories require a new formulation that shall rest on considerations of physiological psychology. And, as a step in this direction (and perhaps as a contribution toward eventual harmony of views about dreams) I would emphasize the importance of what physiologists call the "summation of stimuli," as a resource in explaining the manifestations of irrelevancy in dreams.

STIMULUS-CONTROL IN THE DREAMING PROCESS

Broadly stated, my supposition is that, if the controlling conditions of relevant conversation or of normal mental discourse are analyzed, they will be found to comprise certain distinguishable factors or associative controls, of which, likewise, the analogs or homologs can be delineated as the elements of stimulus-control in dreams. On this basis, a common standard of reference is provided, making possible a parallel between relevant and irrelevant trains of thought, by contrasting the regulated and the (supposedly) unregulated control of the corresponding factors on either side. The *regulated* stimulus-control (recognized as known rules of rhetoric and syntax) is naturally enough, the leading element in the comparison; and the factors in the detailed

working of the comparison, being matters of everyday usage, may be briefly analyzed, as follows:

First, there are the recurring stimuli that keep the mental discourse going; these are often purely external, in dreams as well as in conversations. Second, there is usually some higher unit of associative control, known in controlled-association work as the element of "convergent attention;" this often has the character of "spontaneity" in dreams, or falls into the category of definite purpose, or passionate end, and is often vaguely called Wish. This will be spoken of arbitrarily as the *Uterior Motive*. Thirdly, there is the element which I must refer to—following William James—as the *Topic of Thought*. It often appears quite normally in dreams; but even more than the other two factors, is liable to take an aborted form, and to consist of inchoate residues of recent impressions. At times, it is embryonic and one can trace it out as a sketch or *anlage*, while the dreamer seems to be picking up the thread of thought.

I assume that each one of these elements manifests itself as a process within the nervous mass, involving the functioning of a discrete portion of the neurographic network, or nerve-patterns; and that the imagery of dreams, as well as the mental pictures that take part in any mental discourse, is inseparable from the operation of such substrates. This assumption is made on the same principle that I would state a telephone conversation to be inseparable from the operation of the corresponding instruments, wires, plugs, switchboards and telephone centrals.

MECHANISM OF MENTAL PREPAREDNESS

The idea here presented (of the normal mental discourse) is that the reproduction of any specific relevant image before consciousness is a function of the interplay of the above factors, through their physiological mechanisms; thus partaking of the nature of "reinforcement," "facilitation" (*Bahnung*) or cumulation of their individual effects. This idea, which is that of reciprocal summation occurring between two or three of these factors, is a key—as I view it—to the operations of the mind; but so far as dreams are con-

cerned it has not been made use of as fully as it deserves. And, for this reason, it is the object of the following paragraphs to confer a measure of precision upon the meaning of reinforcement and facilitation in dreams, with particular reference to the mischances in the mutual working of the three factors.

Accordingly, I shall lay stress on the rôle of adventitious forces (that is, of Chance, rather than Design) as making the interferences with the appropriate recall of ideas in dreams; for there seems to be a functioning of trivial thoughts in the summation of stimuli, which is as much under-rated by Freud, Bergson and others, as it is over-estimated in the conceptions of laymen.

In dreams, we find the mind operating with marked irrelevancy in relation not only to the stimuli playing upon the sensorium, but also in the matter of an apparent lack of purposiveness. Yet the eye of analysis can often detect the fairly persistent activity of given stimuli in the dream, coupled with a somewhat tenacious *Ulterior Motive*. It then seems as if the manifestations of irrelevancy were due to the absence of that other integration and organization among the brain elements, which I assume to be necessary for the adequate functioning of the *topic-of-thought*. For the organized *topic-of-thought* may be regarded as a specially prepared system of facilitations, calculated to impart the well-known effect of "coherency" upon the summation-effect of the next (and usually expected) incoming stimulus—as illustrated in any normal conversation. The *topic-of-thought* is thus of the essence of regulated thought, in conjunction with that other "higher unit," of which the "reinforcement" is distinguishable as purpose or *Ulterior Motive*. But all these factors of relevancy, including even the sensorium, maintain their function only on the condition of a certain mental preparedness which is essentially what we mean by the state of vigil, or being awake.

It is this state of preparedness that usually lapses with the advent of sleep; not, I believe, on account of any absolutely inherent peculiarity of the condition of complete repose; but on account of the neglect of any special precautions for maintaining an orderly state of mind on going

to sleep. In other words, we leave our mind to adjust itself, while falling asleep; as we never would think of doing when engaging in conversation. To this unpreparedness of mere negligence, is subsequently added the unpreparedness that arises in regard to unexpected or unforeseeable contingencies. What we reap as a result is the irrelevancy of our responses in dreams, which are analogous to our responses under conditions of emotion, confusion or surprise.

The physiological basis lies in a disintegrative relaxation in the nerve-patterns or neurograms, corresponding to the characteristic relaxation of the reflexes. For this reason, our systems of "reinforcement" or "facilitation," persisting only in a state of disaggregation, are fitful, casual, *i. e.* adventitious in their algebraic effect upon the physiological summations. This is the notion I wish to develop in contradistinction to Bergson's theory, so far as it lays stress upon the effort of selecting a correct percept or apperception for a given stimulus.

THE SUPPOSED LABOR OF RECOLLECTION

On this point of effort, Bergson imagines the *dreaming ego* telling the *waking ego* what is needful to explain the difference between their natures:

"You imagine that in order to hear a dog barking, and to know that it is a dog that barks, you have nothing to do. That is a great mistake. You accomplish, without suspecting it a considerable effort. You take your entire memory, all your accumulated experience, and you bring this formidable mass of memories to converge upon a single point, in such a way as to insert exactly in the sounds you hear that one of your memories which is the most capable of being adapted to it. Nay, you must obtain a perfect adherence, for between the memory that you evoke and the crude sensation that you perceive there must not be the least discrepancy; otherwise you would be just dreaming. This adjustment you can only obtain by an effort of the memory and an effort of the perception. . . You exert then, continually every moment of the day, an enormous effort. Your life in a waking state is a life of labor, even when you

think you are doing nothing, for at every minute you have to choose and every minute exclude."

Reading this as part of a philosophical exposition of the mechanism of dreams, of which the main object is to emphasize the fact that perception in dreams can be explained in terms of perceptive processes of waking life, one would wish to leave the above statements unchallenged, lest one spoil the balance of parts in the admirable whole. Therefore, one would treat the stressing of "effort" with every allowance for the author's drift toward hyperbole. But that which is unimportant vagueness or exaggeration in a philosophical essay may become misleading ambiguity when seen from a psychological viewpoint. For the psychology of dreams requires more precision than even Freud and Bergson have brought to its study; and we should not rest satisfied with the supposed finality of this idea of *deficiency of effort*, any more than with the idea of *Libido*, or the concept of *ensorship* as fundamental explanations of dream processes. So we must aver that Bergson, although brilliantly suggestive in other directions, has, in the present connection, fallen into equivocal statements regarding two entirely different kinds of effort: namely, (a) the effort (of maintaining muscular and nervous tonus) that is incidental to general alertness, *i. e.* to the state of vigil; and (b) the energy of the mental reaction in perception as such.

THE SUBLIMINAL IN PSYCHOPHYSIOLOGY

This concept of effort involves a confusion between the dynamic necessities of maintaining a generalized tension of the organism, on the one hand, and that of raising the tension of a particular portion of the memory register (neurogram) on the other. Admitting that these two tensions interact in the organism, it is all the more important that they should be distinguished, and not blended (by confusion of ideas) in the mind of the psychologist. The needed distinction is not possible in the terms or from the viewpoints adopted by Bergson, requiring as it does the physiological standpoint, which he forsakes when treating of "effort." The modern interpretation of the working of the cerebrum

requires us to keep to the fore a conception which traverses this still indefinite formulation of tension and of effort in Bergson's scheme of explanation: namely, the reflex principle, and the allied idea of the summation of inadequate stimuli for the excitation of a memory-reflex. In this is included the concept of a "threshold of consciousness."

The whole problem of the succession of our thoughts in dreams acquires a different aspect if we regard the evocation of memories from the standpoint of the accepted psychophysiological notion of the threshold of consciousness. In psychology, we may then apply the distinction that physiologists have long recognized between so-called *liminal subliminal* and *supraliminal* stimuli or excitations, as abundantly illustrated in the reflex activities of the laboratory frog. Popularly speaking, this means that below the zone of conscious thought there are, as Galton, Janet, Prince have long contended, quasi-mental activities continually going on, although shut off from observation. This idea of subliminal processes (lately enriched by Woodworth's "Imageless Thought") is one that everyday experience, when tutored by psychological insight, is well fitted to confirm and enlarge. For who is there who has not, at one time or another, sensed the "threshold of recall" through a name long sought for in vain, and later slowly emerging after several trials had brought a feeling of "nearness." A long chapter could be written about these reluctant or fleeting memories of which one says, "I thought I had it on the tip of my tongue," or "It flashed by, but now I have lost it." These mechanisms might be spoken of as "threshold phenomena." They are the ones, *par excellence*, to procure the elucidation of the phenomena of dream life.

It is an intrinsic feature of the present argument to treat the appearance of a given image before consciousness as a function of a rise of excitation in a nervous substrate or neurogram. To "flash" the neurogram (supraliminally) takes time, what may be called "finding time;" and the delayed response of the proper experiential equivalent of a stimulus or cue is subject to peculiar variations and mishaps according to the previous excitability or "facilitation" of the corresponding neurograms or nerve patterns. This has

already been set forth distinctly, although somewhat hypothetically, in a previous paper on the "Apparent Inversion of Time in Dreams." It was explained, in connection with the concept of "apperceptive delay" that the headway of previously facilitated neurograms might cause these to flash into consciousness in advance of the neurogram most appropriate to the stimulus. It remains to explain and illustrate a number of the features of this concept; especially is it necessary to define the process of physiological summation in connection therewith. Accordingly, the following example is chosen to illustrate the concurrent effect of two cues in flashing a series of neurograms which represent trial apperceptions of the principal cue or stimulus. At the same time, the principles of apperceptive delay and *oniric inversion* will be conveniently exhibited in their working.

THE DREAM OF THE PANTRY CUPBOARD

Circumstances of the Dream. Having to take in haste a train in the afternoon, I forego my luncheon in order to catch the one o'clock express, which carries no dining car. On the principle that *qui dort dîne*, I decide to sleep as long and as deeply as possible during the "run," which is to be of one hour. Having learned a special technique for inducing states of relaxation, I make the fullest trial of it in these circumstances. The success is made evident by the enjoyment of a deep and refreshing sleep, in which the only specific incident is the following dream:

The Dream: I see a child, apparently six years old, in a plain brown dress with a short skirt, standing on a chair in front of a cupboard, the open door of which reveals the shelves within. The child's back is turned, while it reaches above its head to replace on a shelf, a jam pot, from which liberal sustenance has been taken, as evidenced by the jam-bedaubed hand and the cheek in profile. Suddenly, the child turns from this business, as if caught in the act—*flagrante delicto*—bringing into full view a surprised and horror-stricken visage. The emotion thus portrayed is one I (as dreamer) soon

come to share, as an apprehension justified by an unearthly screech apparently emanating from outside the pantry, first as if from the kitchen nearby, and then as if from outside the pantry window. Finally the sound seems to hover about in unlocalized fashion.

I then awake to the stridulant noise of the car-wheels grinding on the curve, as we turn into the station-yard at my destination.

The characteristic features of this dream are: 1. The extreme irrelevancy of the precursory images. 2. The correct apprehension of the sound's *quality* before the end of the dream. 3. The simplicity of the factors in play, as shown by the subsequent analysis.

The pantry cupboard scene is evidently a phantasy provoked by two accidentally conjoined but logically unrelated stimuli: the one a hunger sensation, the other a sound of screeching wheels. There is, as I view it, automatic representation or "reproduction" of imagery that is relevant to the two jointly, but in varying proportion. The resulting compound of reproductive effects can be visualized very much in the same way as one pictures the composition of mechanical forces through the well-known "parallelogram of forces;" a circumstance of which advantage is taken in the accompanying diagram.

THE GIVEN CUES AND THE INDEX OF RELEVANCY

The figure makes it possible to conceive the effect of *varied reaction* that is produced by the same two reproductive tendencies when operating at different and shifting intensities. It will be seen, from the "phases" of the diagram, how the influence of one reproductive tendency grows as the other dwindles, and how the severally depicted ratios between these influences correspondingly determine distinctive reproductions from memory. Here we can imagine how quantitative relations among the factors of stimulation might determine the qualitative selections in mental reactions. For, in view of this schema, there seems to have been obtained a measure of that "perfect adherence" which is

supposed by Bergson to be so characteristically lacking in the dreaming process.

The violation of the rules of ordinary waking association (relevancy) comes from the fact that the two stimuli in operation, are such as we would, if awake, especially guard against conjoining—having in mind actively the requirement of controlling our responses in relation to specific topics of thought. Such elements of control being here absent, any two other factors are sufficient to control the response. This still shows adaptation of *response* to *stimulus*, but illustrates the bizarre effect of adventitious junctions between otherwise unrelated cues. It follows that it should interest us quite as much to understand the relevancy of the dream images to the wrong cue (hunger) as to comprehend the irrelevancy in regard to the right cue (sound); this discrepancy being especially marked at the beginning of the dream.

The relevancy of the dream imagery to the principal cue (sound) is obviously the inverse of the degree of relevancy to the accessory cue. This may be expressed as an *index of relevancy*, in terms of common fractions, to wit:—

Relevancy to Hunger Cue: $\frac{\text{Vertical Co-ordinate}}{\text{Horizontal Co-ordinate}}$

Relevancy to Sound Cue: $\frac{\text{Horizontal Co-ordinate}}{\text{Vertical Co-ordinate}}$

Thus the one dwindles while the other grows, inversely. Eventually there is complete elimination of the Hunger Cue's influence. Especially remarkable is the process whereby one cue may cause irrelevancy of response to another more important cue, with which adventitious conjunction has taken place. The process can be analyzed in purely dynamic terms, applicable not only to this simple dream, but to innumerable other lapses from coherency, in complex cases.

THRESHOLD PHENOMENA OF THE DREAM

The simplicity of the factors in this dream is to be accounted for by the circumstance that I had, when going to sleep, slowly and deliberately relaxed the attention; employing unusual precautions for getting rid of adventitious facilitations. This means that I had reduced to a minimum the interference-rôle of casual memories, which might other-

wise have "perseverated" as sub-excited neurograms, over-ready to add their confusing effect to the summation of forces. But, if I have chosen this dream for illustration, it is precisely because it permits the formulation of the working of two of the factors without the interference of having to consider the third. As it is, the sole interfering factor, to be traced in its operation, is the non-germane cue of Hunger. The factor conventionally named topic-of-thought is removed from the problem—made negligible—owing to the "demobilization" of the corresponding neurograms, during the pre-sleeping period. The preparation for sleep thus gave a clear field for the interactions of the two cues, as we shall now see.

Let us here suppose, then, that the actual sensation or prompting of *appetite* remained sub-excited, in spite of the relaxation. The sound of *wheels grinding* would thus come as a second, more powerful excitation to set the other in operation, by a process of physiological summation in the neurones and at the synapses. Thereafter, the order of events becomes an expression of these interacting influences or reproductive tendencies, which we can visualize as follows:

1. Hunger stimuli, reinforced by a general excitation of the nerve system through a powerful auditory stimulus, sub-excite a group of memories—a whole gallery of pictures, as it were—associated with the satisfaction of hunger; or, in different terms, the available neurograms registered in connection with eating-situations become partially aroused. These are positive responses (subliminal of course) to the non-germane cue of hunger, called the *accessory cue*, and corresponding to "Ulterior Motive."

2. Persistent screeching *sounds of wheels grinding* arouse, by emotional congruity, a set of experiences or mental images previously constellated with surprise-horror situations: *i. e.*, the neurograms for these memories are sub-excited, pre-stimulated, as are already the more activated hunger-neurograms. These are the nascent sub-excitations germane to the *principal cue*.

3. A reciprocal summation-effect (reinforcement) is developed as between the two systems of sub-excited neurograms. That is, the excitation or neurodynamic impulse—

“neurodyn,” let me call it for short—spreading from the two sources in question, and escaping through various nerve channels (neurographic canalizations) encounters a neurogram wherein its flow is doubled upon itself; for the “neurodyn” has reached a nerve pattern common to both subexcited registers of memory; a junction-point has been found, as may adventitiously occur whenever any two systems of thought are activated. Accordingly, the tension (neururgic tonus) becomes supraliminal in that neurogram: the neurodyn flows to it until the physiological fact of summation becomes translated into a psychological perception.

4. The psychic correlate of the nerve pattern, thus designated by the *rendez-vous* of nerve impulses from two sensory foci, is flashed into the dream: it is none other than the scene of a child stealing jam and caught in the act. On analysis this proves to have been a most perfect and relevant “selection;” this being, of all my memory-pictures (as I figure it) the only one in which the indulgence of appetite and the emotion of surprise-horror could possibly have coalesced. For, as I may now explain, the dream picture in question corresponds to an experience of my childhood; the cupboard and the child’s kilt being contemporaneous with my sixth birthday, as well as the partiality for jam, and my interest in that particular cupboard.

5. Meantime, the auditory areas of my brain have not failed to pass on their excitation continually to the association fields that mediate the memory of emotion and of the muscular action-patterns for surprise-horror, or fear. These incipient innervations within my own nerve-muscle system are at once painted upon the child’s face: they are transposed, externalized, in accordance with that histrionic type of association that Emerson, Galton and number of other writers on dreams have long called attention to.

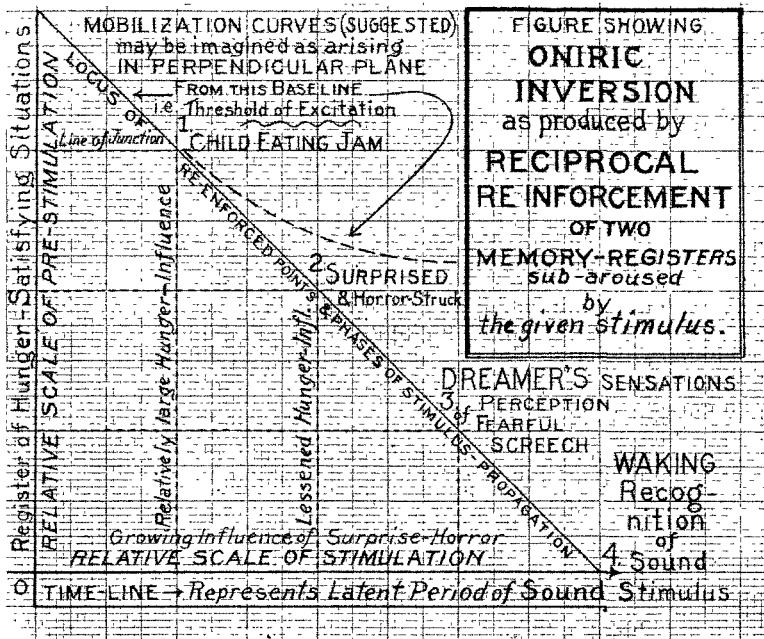
(The “projection” of emotion upon an *alter ego*, either as a feature of insanity or as an incident of dreaming, furnishes a topic replete with cases parallel to this one.)

EMERGENCE OF THE CORRECT EXPERIENTIAL EQUIVALENT

6. The auditory stimulus is coming into its own: the

sub-excited neurograms closely affiliated with (relevant to) the sound in question are now manifested in consciousness.

If these did not show themselves sooner, through the earlier "flashing" of their correlated conscious imagery, it was because not enough time had passed for the stimulus to gather strength: the summation-product of the "neurodyn" from the two sources (hunger-register and sound-register) still remained below the "flashing point." *But none the less the sound stimulus had, from the very start, joined with the pre-stimulated hunger stimulus in "flashing" other neurograms wherein the neurodyn had consequently become more rapidly reinforced.* This explains how the incorrect images outstrip the correct ones now emerging.



This stage of the dream is characterized by the consciousness of some horror-inspiring sound, which is conceived as originating from the now fading setting of pantry, kitchen, or space outside the window; but the sound-percept detaches itself from one after another of these settings till the screech seems to come from nowhere in particular. (One might

say that the sound was correctly *perceived* at this point but incorrectly *apperceived*.)

7. Next, there is the awakening. All that was missing for a completely normal or relevant recognition of the stimulus is now supplied by the returning sense of orientation, which installs the sound of wheels-in-the-curve amid its proper settings of train and railroad yard.

The change of conditions is not so great as might seem: there has been, as a result of the awakening, only a broadening of the associations: a recollection of all the characteristics of the sound that was so aptly sensed in the dream. For, as Prince has put it, "recollection is only a more perfect kind of memory." ("The Unconscious".)

8. Complete repose of mind and body persist for some time after this awakening—a characteristic condition of rest recalling certain experiments in which I proved (to myself at least) that awareness may be maintained and correct apperceptive processes carried on consistently with a degree of general relaxation comparable to that of sleep itself.

However that may be, I remain strikingly free from any sense of effort, I have no perplexity or memory of perplexity, nor can I detect any psychic or physical condition that would give support to the proposition that I had been engaged in any sort of mental labor of the order of voluntary attention.

So much then for the analysis of the stages of this dream.

THE DOCTRINE OF EFFORT

I am under the impression that my organism, at first in sleep and then in the waking state, had been simply responding to the sound stimulus according to a purely reflex principle: the phantasmagoria taking the shape that we have seen, simply because the organism was responding along the lines of least resistance. To anyone having well in mind the distinction between voluntary and involuntary attention, it will not seem necessary at once to assume that there was "effort;" unless this word is applicable to the

mere fact of nerve conduction. It would seem to be stretching the term to apply it to the definitely timed and delimitable distribution of the impulse from a stimulus, at its regular rate of approximately 100 feet per second or to the incidental delays at the synapses. These are the basic facts contemplated in the conception of Apperceptive Delay which I would offer in place of the conception of Effort.

The delay in reaching the correct apperception of the principal stimulus and the precursory evocation of irrelevant images, and the gradual shifting or orientation toward relevancy, are explainable—according to my view—not as due to increasing effort, but as due to a simple change in dynamic relations between two cues. The bizarre images are to be regarded as incidental, supernumerary processes: a shunting of the stimulus-wave through nerve-switches or synapses, following the line of least resistance. And correspondingly, the escapement of stimulus and its debouching into consciousness as imagery, are to be visualized as depending upon the gathering strength of one stimulus (sound) and the COMPARATIVE WANING of the other (hunger).

But Bergson's theory as to why incorrect images are evoked is almost the exact reverse of my own: he emphasizes the dreamer's lack of power to summon the correct image before consciousness; whereas I insist that mal-apperception is demonstrably a function of the abnormal readiness (facilitation or reinforcement) on the part of other alien images, which thereby possess an advantage at the beginning of the apperceptive process. Bergson's statement on the point of effort is positive:

"What requires effort is the precision of adjustment. To connect the sound of a barking dog with the memory of a crowd that murmurs and shouts requires no effort. But in order that this sound should be perceived as the barking of a dog, a positive effort must be made. It is this force that the dreamer lacks. It is by that and by that alone, that he is distinguished from the waking man."

THE REFLEX NATURE OF PERCEPTION

Now, in place of the doctrine of effort, as above stated, we shall need to develop the more definite conception of

reflex-facilitation and especially of relative facilitation; first brushing aside those views about "force" which can serve only to becloud the issue of fact.

To start with, we should understand that the cart has been put before the horse, in this insistence upon effort: actually the stimulus of a dog barking, of a door slamming, or of other similar phenomenon, supplies of its own motion sufficient excitation to account for many subsequent association-processes, regardless of any alleged initiative on the part of the perceiving or apperceiving organism. And here is the place to insist again on the fact that the use of our stock of ideas (neurograms) in perception, apperception and in non-forced attention is ordinarily reflex in character and correspondingly effortless.

On the other hand, if we should take literally the conception of Bergson as to the means of precise adjustment in perception, we should have to regard the mind as a book without an index: each cue or stimulus-idea would require a turning of all the pages of experience to find the appropriate mental picture. But, fortunately, the memory embodies devices that are essentially labor-saving, and adapted to the function of economically utilizing the mental register, which is made up of so-called "experiences." The mind's economy has been aptly characterized by R. W. Emerson:

"There is no book like the memory, none with such a good index, and that of every kind, alphabetic, systematic, arranged by names of persons, by colors, tastes, smells, shapes, likeness, unlikeness, by all sorts of mysterious hooks and eyes to catch and hold, and contrivances for giving a hint."

Moreover, when one considers the doubt that has been cast by Thorndike and others, upon the existence of any true intellectual fatigue, and the demonstration of widely spread confusion of ideas on this subject as revealed by laboratory findings and curves for mental work, it seems well to think twice before accepting a similarly questionable concept, like deficiency of force in the dreamer, or his lack of mental effort, as an explanation of the incoherency of dreams.

ADVENTITIOUS FACILITATIONS AND REINFORCEMENTS

If we fall into perceptive or apperceptive errors, when drowsy or when dreaming, it is not, so far as I can discover, due to the dropping out of some supposititious factor named "effort," but on account of specific definable circumstances, which, however, have so far not been given their due weight in any theory of dreams. These circumstances relate to the physiological topics of facilitation (*Bahnung*) and reinforcement, and to the summation of inadequate stimuli below the threshold of consciousness.

Already, in a paper on "The Apparent Inversion of Time" in a certain kind of dream, I have undertaken to apply these physiological notions to elucidating the mechanism of trial-and-error in dreams. A somewhat hypothetical illustration was offered in the shape of the Door Slam Dream; in which instance the slamming of a door was mal-apperceived as the firing of a shot in battle, and made the conclusion of a phantasy of *going to war*, after *enlisting* and so on. This series of seemingly straightforward dream tableaux was discussed so as to bring out the inversion of the original order of the subconscious train of ideas. It was argued that trial apperceptions of the persisting stimulus might become active as a series or chain of reactions (*oniric catena*) in which the stimulus called up one idea, and this another in turn and so on, very much as a locomotive starts a string of freight cars; and all this was supposed to have been made possible by a previously linked-together topic-of-thought namely, War and Enlistment. The accompanying diagram showed how this train of ideas might be started up by the stimulus so that the last link in the chain became the first to manifest itself in consciousness; thus, indicating for any dream of that type, what the mechanism of apparent time-reversal would be. The explanation was made to depend upon the conception of residual tensions, perseverating as facilitations derived from the previous topic-of-thought.

The present paper is in part the same. It completes the theory of time-reversal by showing how the identical phenomenon (*oniric inversion*) may be brought about by a

reflex-facilitation and especially of relative facilitation; first brushing aside those views about "force" which can serve only to becloud the issue of fact.

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ADVENTITIOUS FACILITATIONS AND REINFORCEMENTS

If we fall into perceptive or apperceptive errors, when drowsy or when dreaming, it is not, so far as I can discover, due to the dropping out of some supposititious factor named "effort," but on account of specific definable circumstances, which, however, have so far not been given their due weight in any theory of dreams. These circumstances relate to the physiological topics of facilitation (*Bahnung*) and reinforcement, and to the summation of inadequate stimuli below the threshold of consciousness.

Already, in a paper on "The Apparent Inversion of Time" in a certain kind of dream, I have undertaken to apply these physiological notions to elucidating the mechanism of trial-and-error in dreams. A somewhat hypothetical illustration was offered in the shape of the Door Slam Dream; in which instance the slamming of a door was mal-apperceived as the firing of a shot in battle, and made the conclusion of a phantasy of *going to war*, after *enlisting* and so on. This series of seemingly straightforward dream tableaux was discussed so as to bring out the inversion of the original order of the subconscious train of ideas. It was argued that trial apperceptions of the persisting stimulus might become active as a series or chain of reactions (*oniric catena*) in which the stimulus called up one idea, and this another in turn and so on, very much as a locomotive starts a string of freight cars; and all this was supposed to have been made possible by a previously linked-together topic-of-thought namely, War and Enlistment. The accompanying diagram showed how this train of ideas might be started up by the stimulus so that the last link in the chain became the first to manifest itself in consciousness; thus, indicating for any dream of that type, what the mechanism of apparent time-reversal would be. The explanation was made to depend upon the conception of residual tensions, perseverating as facilitations derived from the previous topic-of-thought.

The present paper is in part the same. It completes the theory of time-reversal by showing how the identical phenomenon (*oniric inversion*) may be brought about by a

different pairing among the three assumed factors; namely, in this case, between the stimulus (principal cue) and the ulterior motive (accessory cue). The mutual summations from these two sources, can (as shown in the illustration) be viewed as producing a precursory set of trial apperceptions while the correct apperception is slowly rising into consciousness, thus simulating a time-reversal, as in the Door Slam Dream. But in the Pantry Cupboard Dream, the two cues (hunger and sound) are in concurrent activity and reinforce one another; while in the earlier illustration there is simply a residual facilitation holding over from a (supposedly) waking topic-of-thought. The distinction, to be sure, is one that can hardly be maintained except in the interest of a schematic presentation like the present one. This requires me to speak arbitrarily of reinforcement when dealing with the summation effect of the accessory cue, and of facilitation when speaking of the influence of residual tensions pertaining to the past topic-of-thought.

In either case, whether we deal with an active reinforcement or a passive facilitation, the effect is the same upon the mental discourse of the dreamer: namely, an escape from the course that would normally be dictated by the principal cue, a seeming diversion into side channels of association (like "wool-gathering") and the reproduction in the dreaming consciousness of a series of images that at first appear to have nothing in common with the cue under consideration. But when the complete series is reviewed—and especially when it is completed by a correct waking percept—it becomes apparent that, from the very beginning, the earlier images did bear a certain relevancy to the principal cue after all.

Out of the wonderment caused by the experience of these bizarre trains of thought, with their surprising approximation to the stimulus that wakes the dreamer, has arisen the problem of so-called time-inversion, the mechanism of which is here sketched. Thus, whether the trial apperceptions of a stimulus are aroused by reinforcement or by facilitation, it amounts to the same thing in one respect: there is a fanciful filling-in of images ancillary to the "cor-

rect-idea-of-the-stimulus" (*stimulus-idea*) pending the appearance of the latter in consciousness.

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II

VICARIOUS MANIFESTATIONS OF THE STIMULUS-IDEA

It can scarcely be repeated too often that the "normal experiential equivalent of the stimulus or cue" (*stimulus-idea*) usually is from the beginning a factor in producing the so-called trial apperceptions. These are oftentimes so peculiarly marshalled by the influence of the *stimulus-idea* that they amount to "proxies" or foreshadowings of it. Some writers, not understanding the ultimate character of these trial apperceptions have called them "symbols;" whereby much loose thinking on the subject has been introduced into dream study. And the idea of so-called "symbolism" having gained entrance into the field of dream interpretation, has opened the way for a flood of speculation on the relation of dreams to folklore, mythology and philosophy, a divagation with which the present account can have nothing to do. Suffice it to say that because the alleged "symbol" in the dream actually has the character of a trial apperception, it must necessarily happen that it approximates or simulates at times the sort of vicarious thinking, or reasoning by "proxies" which we call symbolism when encountered in the operations of full consciousness. For practical purposes, the "symbols" of the psycho-analytic schools have only this in common with the formulation of Trial Apperceptions, namely that from both alike inferences can be drawn. But the difference is that the formulation of Symbolism lends itself conspicuously to false inferences as to the mechanism and meaning of what is going on in the dreamer's mind!

Whatever may be said in favor of the psycho-analytic practice of treating dream items as out-and-out "symbols," comporting a transcendental meaning, this is none the less—from a purely intellectual point-of-view—a "lazy man's

method" of reaching out for the implications of a given dream. And this is so because it sets aside many intellectual precautions, which the probability of error, the range of individual differences, and other considerations of method should impose.

That dream items may present vicariously and darkly certain qualities of the non-appearing *stimulus-idea* is demonstrable; but patient care must be used in exploiting the principle thus suggested, lest the bounds of reasonable inference be overstepped. And the current psycho-analytic conceptions of Symbolism do go out of bounds in overriding such salutary checks upon speculation as are furnished by the biological principles of Varied Reaction, Trial and Error, Interferences with Recall, Reaction Time, and other more purely psychological principles that might be mentioned and with all of which the present theory of Trial Apperceptions is in accord.

INCONSTANCY OF VICARIOUS REPRESENTATION

Empirically, that extreme conception of Vicarious Representation which is implied by the psycho-analytic doctrines of Symbolism, rests on the alleged constancy with which certain "symbols," (in the shape of specific dream items affected with a special meaning) are supposed to recur. But after investigating the dreams of a great variety of subjects and collecting several thousand examples through a period of about seven years, I am unable to verify this supposition of constant meaning or fixed symbolism in any positive degree. What I have found is that snakes, umbrellas, sticks, wells, water, treacle, roast beef, burning meat and what not, may appear as images in a dream on account of some cryptic *stimulus-idea* that is acting as an incitement to subliminal free-association, and which controls the "flashing" of the item through some slight bond of similarity, or of contiguity in experience. But, as I have set forth, *snakes* in a dream may "symbolize" a dangerous well; that is, the cylindrical shape, the danger involved and other properties may be "colors" or reflections of the *stimulus-idea* simply by the most tenuous similarities and by the

most adventitious circumstances. For, to invoke again the present theory, the slight influence of the *stimulus-idea* upon a mass of ancillary ideas, of potential Trial Apperceptions, may find itself, in the most impromptu manner, reinforced or facilitated in a particular direction by either or both of the other two factors in stimulus-control, namely the Uterior Motive or the Topic of Thought. There is thus no necessary fixity in the relation between so-called Latent and Manifest Contents of the dream. Such precarious relationship as there may be in the typical phallic "symbols," quoted by the psycho-analytic schools, cannot justify the application of the conception of Symbolism, except in the narrowest and most metaphorical sense.

The supposed fixity of dream "symbols" is further contradicted if one extends one's study of dreams to include a picture of the different ways in which the same *stimulus-ideas* (let us say those of the sexual life) may be vicariously represented in the form of dream items—above referred to as trial apperceptions. Here it is found that the same dreamer rarely (in some cases never) is discovered to reproduce the same dream item in connection with the same stimulus-idea. On the contrary, the trial apperceptions of sexual *stimulus-ideas* are bewildering in their variety, their remoteness, and their inconceivably far-fetched resemblances; just as they are also captivating to the imagination of the transcendental symbolist by their occasional mimicry of apt phraseology or of pornographic allusions.

THE POSSIBILITY OF SO-CALLED REPRESSION

As to the Freudian formulation of "repression" (*Verdrängung*) as the cause of the cryptic character of dream items, it cannot be rejected altogether; because inhibitions unquestionably do play a part in producing the "symbolism" of some dreams; but, again, not to the extent figured in psycho-analytic literature. In cases too numerous to mention, the alleged deletion of the dreamer's latent idea, as imputed to the Endopsychic Censor, seems to be attributed without any real basis to this mythical Cerberus of the Unconscious Regions. This idea of Censorship seems

tice today by the process of "wasting" ammunition as an incident of finding the range.

In the organism of the sciences, something similar takes place, although the individual scientific workers are not always as circumspect in their adventures as the measuring-worm. It is rather in large bodies or "schools" that the scientific theorizers swing from one extreme to another. This has always been true of the pendulum of medical progress; and the present vogue of Freud's conceptions, in the so-called Psycho-analytic Movement, is a case in point. But there is even now a backswing in the shape of the Zurich school's attempt to refute a number of the Freudian generalizations. Standing apart, but also representing an extreme swing in one direction, is the essay of Bergson, which attempts to make of peripheral stimuli and entoptic phenomena (phosphenes) as sure a key to dreams as Freud claims to have forged out of Symbolism, Censorship and Repression.

CURRENT THEORIES OF DREAMS

Seeking to establish a contrast between these authors, in the light of the present theory, one might say that Professor Bergson conceives the dream phantasy to be obedient to the external stimulation (over-stressing especially entoptic stimuli) in a measure that is not verified when one studies dreams "as they come." Dr. Freud, on the other hand, appears to exaggerate the constancy and purposiveness with which the cryptic factor of Ulterior Motive governs the phantasmagoria. As to the remaining element, consisting usually of adventitious facilitations (Topic of Thought), this seems to have afforded the Zurich school their opportunity to view dreams one-sidedly, from an angle distinctively their own.

The theory of Dr. Jung, leader of this school, holds to a curiously amended Freudism, and teaches that the dream has a deep meaning, not only in the regressive sense, but in the progressive sense; regarded thus teleologically, it expresses the *élan vital* of the dreamer, in its movement through Symbolism, toward a higher adjustment of his in-

ternal psychological situation to the requirements of real life. In this way of thinking, the Zurich school apparently endeavors to meet the criticisms leveled at Psycho-analysis, notably by Dr. Prince, on account of its neglect of biological truths. But however unimpeachable these truistic general propositions may be, their specific utilization suggests that so far Dr. Jung has achieved only a glimpse, a trial apprehension, of the mechanism of dreams. He simply uses the adventitious topics that arise during dream analysis as a means of exploring the life-purposes of the individual. This is rather an extension of his (Jung's) free-association experiments than a genuine explanation of the total mechanism of dreaming.

While my own argument for a many-sided view of dreams may prove to have quite serious aberrations of its own, it seems to me that the constructive method of Jung is not as eclectic as it purports to be; but that it runs into the same mistakes of *parti pris*, as Freud's reductive method. This is an error conspicuous by its absence in Professor Bergson's presentation of his views, which are extraordinarily clear and suggestive, considering that he has never made a specialty of dream investigation. In fine, what has been lacking is a balanced conception of the dreaming process. This requires an unprejudiced outlook upon all the different permutations and combinations of effects to which the three groups of dream factors lend themselves, as here sketched.

A broader outlook upon the dream must be developed. And this will come, I dare say, by putting aside the doctrine of Symbolism and setting up in its place what I may call a doctrine of Errorism. This would be based on the trial-and-error concept, and would be related through biology to the behavior of all organisms, from animalcula to Man.

It is in the spirit of these ideas that the Pantry Cupboard Dream has been analyzed. In terms of physiological summations and mental reactions, its interpretation remains on the biologic level of the "resolution of physiological states." This does not imply, however, that the same mechanism will not serve to explain the higher moral and social integrations of thought, in competition with current

doctrines of Symbolism; it implies only that such topics would be out of place in dealing with this unusually clean-cut instance of the operation of two out of three of the regulators of the mental discourse here schematized. In this connection, it is perhaps more than I should hope for, to have made intelligible how these factors—by their fits and misfits—can produce the bizarre irrelevancies of the dream. Yet, however arbitrary this scheme of factors may seem, it should none the less be of advantage to any student of dreams to imitate this example of regarding dreams as likely to be affected by “a number of things!”

As a feature of method, some such scheme of determinants, as embodied in the explanation of the Pantry Cupboard Dream, prevents the interpreter from losing sight of the variability of thought, and from overlooking those guarantees of Varied Reaction which Nature has endowed us withal, but which seem to be denied by existing theories of Symbolism.

SUMMARY

In connection with dreams, the physiological idea of “facilitation” and “reinforcement” acquires fruitfulness if we regard the dreamer as mal-apperceiving the stimulus not alone because he is under-prepared in the domain of the correct constellation of memories, but also as subliminally pre-stimulated and over-prepared in the direction of the irrelevant response. Thus, there are two sides to the question; and irrelevancy is not to be thought of naïvely as due to the lack of sufficient energy on the dreamer’s part, to summon the correct image. Apart, then, from any doctrine of effort, we must give heed in every case to the state of pre-perception or of concurrent stimulation out of which the dream, as a mental reaction, is developed.

The illustration given (Pantry Cupboard Dream) emphasizes the non-essential character of “effort” in connection with apperceiving a stimulus, in the relaxed condition of the organism. The trial-and-error feature of the dream is explained by the probabilities in the case: it is attributed to the chances of mis-preparation for reacting to the stimulus;

this, in turn, is laid to the IRREGULAR LAPSING of the (normally) integrated units of control-association. It is thereby implied that there can be such a thing as mental preparedness even in the state of sleep.

Consequences of adventitious facilitation and reinforcement. The mal-apperception of the sound of "wheels-grinding," in the Pantry Cupboard Dream, occurred, not simply because the dreamer was "too relaxed" or could not supply the necessary "effort," but, paradoxically speaking, because he was not relaxed enough: there remained one particular adventitious reinforcement that made the interference with recall, namely a hunger sensation. Had this been eliminated—by indulgence in a moderate meal—the different elements of the dreamer's memory would have been equably lowered in their neururgic tensions. In view of the pains taken to remove all other adventitious facilitations, before going to sleep, it is easy to see what would have happened but for the prepotency of the hunger stimulus; to wit: the correct response would have had an equal chance with the false train of ideas that substituted themselves under the impulse of hunger.

In an ideal state of complete relaxation, even without "effort," the force of a stimulus should normally exert itself directly and more exclusively upon the appropriate and firmly established connection with the stock of ideas. Irrelevant reactions depend upon relative, not absolute, tensions.

II

Vicarious Evocation. The obverse, so to speak, of adventitious facilitation or reinforcement is apperceptive delay: the former favor unduly the evocation in consciousness of more or less alien ancillary images (albeit they are sufficiently cognate to the stimulus to be mobilized by it); while the delay in question represents the overcoming of resistance and time lost at the non-prepared synapses, over which the stimulus-wave must pass to reproduce the correct image. As to this correct image, the crucial point is that, in the simpler cases of apperception, it is really stimulated

first of all, below the threshold and without the preliminary excursions that seem to be implied by the (supraliminal) trains of thought in consciousness. This, at least, is the view I propose as a means of simplifying the conception of a number of paradoxical mechanisms in dreams. The view is supported by the frequency with which the precursory images are proved to have felt, from their incipience, the influence of the *stimulus-idea*.

Accordingly, the apparent groping (*tâtonnement*) manifested in the course of supraliminal processes does not imply a corresponding sequence in the course of subliminal excitation; a fact to which the study of *oniric inversion* bears witness. Neither does the phenomenon of groping necessarily depend upon the supposedly characteristic lack of "force" in the dreaming person. The real explanation lies in a conception of trial-and-error that contemplates mainly the shifting of emphasis in the neurograms, conditioned by relative reaction-times, whereby first the wrong and then the more nearly correct image prevails in consciousness. This view is corroborated by the groping type of behavior illustrated in conditions not those of sleep and relaxation: namely, by everyday waking lapses, illusions, amnesias, and inversions of letters and words when speaking or writing.

The conception of repression, in the outré acceptation of the Freudian school fails to throw a true light upon apperceptive errors; unless it be in those cases, not as numerous as supposed, wherein the apperceptive delay is distinctly prolonged by the existence of a definite inhibition. But in the general run of dreams, on the contrary, it is not the inertia or apperceptive delay that is abnormal and thus produces *bizarrerie*; it is the abnormal readiness of other images, not "wanted," that causes their intrusion and the effect of *malapropos* and incoherency.

This intrusion of images relatively hyperfacilitated or reinforced through adventitious conditions is the basis of the explanation of the apparent inversion of time and it must form the groundwork of any thoroughgoing theory of the dreaming process, with especial reference to the so-called absurdity of dreams.

REFERENCES, NOTES AND CORRECTIONS

- A. See titles appended to the two papers mentioned:
1. "Scientific Method in the Interpretation of Dreams;" *Journ. Abn. Psychology*, February-March, 1916. note *erratum*: "Studies in Psychoanalysis" etc., should be "The Theory of Psychoanalysis" by Dr. C. G. Jung, published in *Psychoanalytic Review* and Monograph of Journal of Nervous and Mental Disease (1913-14.)
 2. "The Apparent Inversion of Time in Dreams;" *Journ. Abn Psychology*, April-May, 1916.
See reference to Bernard-Leroy, Eugene: "Sur L'Inversion du Temps dans le Rêve;" instead of "non-psychological" (misprint) read: "A *non-physiological* approach to the topic in question."
See Bergson's "Dreams, Mechanism of . ." B. W. Huebsch, New York, 1914.
- B. For physiological conception of Mental Reactions see views of Prof. Woodworth in "The Consciousness of Relation," in the Columbia University volume in honor of William James. Also "Mechanism of Thought," in Ladd & Woodworth's *Elements of Physiological Psychology*;" Scribners, 1911.
- C. For a discussion of ultimate implications of mechanistic views on mental reactions, see
William James on "Reflex Action and Theism," in "The Will to Believe;" Longmans, Green and Co., New York, 1908.
- D. The trial-and-error theory of dreams aligns itself with well-defined conceptions of abnormal and of normal psychology; to wit: the Neurographic Hypothesis of Morton Prince, and the Mental Reaction Theory of Woodworth. For these, see "The Unconscious" (Macmillan, 1914) and "A Revision of Imageless Thought" (*Psychological Review*, January, 1915) respectively.