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The Mind/Brain State

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The minimal mind/brain state is the completion of one cycle of actualization that entails a passage over evolutionary growth planes from instinctual drive to the world surface, from a subjective core to an appearance of external reality. An isolated mental state is an abstraction, not only because it is fleeting and replaced but because a series of states is necessary for intra-psychic content. The state is not a content, a feeling, a statement, or qualia that can be isolated and compared to contents in other minds. Rather, it enfolds a diachronic and recurrent underpinning of actual or virtual contents that arise in the realization of acts and objects. The mind/brain is not a circuit board but an organism, and the process of realization is a becoming-into-being. The endpoint of the state, the configuration that arrives at the motor and perceptual cortices, submits to an adaptive sculpting that transforms endogenous potential to a diversity of world objects. Mental states overlap; they are not concatenated in causal chains. The transition is from potential to actual, category to member, or whole to part. The specious or illusory present arises in the overlap of mental states and the incomplete revival of their predecessors. Incompleteness is the key to recall as fading states lapse to successive planes of short- and long-term memory. The present arises in the forgetting of perceptions, or the passage of perceptual to memorial content, as the disparity between the floor of the mental state — the endpoint of withdrawal beneath recall — and conscious revival — the ceiling of the mental state — and the final actuality. This disparity is converted to an epoch of duration. Consciousness is the relation over segments from core self to perceived object. In dream, the absence of agency, the foreshortened, egocentric, and palpable space and fluid image boundaries point to a contracted present in which the state does not fully actualize. The river of Heraclites is not a flow that goes on but a fountain that recurs, with the present a brief suspension of succession in the endless passage of nature.

Keywords: mental state, microgenesis, mind and brain

"The doctrines which best repay critical examination are those which for the longest period have remained unquestioned"
Whitehead (1933, p. 228)

This review is a concentrated description and advancement of a theory of the mind/brain state that is discussed in greater detail in prior works. Correspondence concerning this article should be addressed to Jason W. Brown, M.D., 66 E 79th Street, New York, New York 10075. Email: drjbrown@hotmail.com

Is the mind an imprint of the world, a tabula rasa to be articulated by experience, as common sense and much of empirical science would have it? Is perceptual reality an elaboration of the mind, as philosophers before and especially after Descartes have maintained, or are there two parallel worlds, inner and outer, in constant interaction? The mind assimilates the world as it shapes experience, adding interest, value, beauty and meaning to a world unpossessed of these qualities. Is the innate constrained or is knowledge instilled? Regardless of which perspective one takes, or the variation on that perspective, the primacy of the self, the evanescence and insubstantiality of thought and the felt unity of mind must be reconciled with the dazzling multiplicity of nature and a solid persisting world. The seemingly insurmountable problem in resolving these perspectives, at least by force of argumentation, which arise from our ignorance of the relation of mind-internal to the outer world, has inspired much of the discussion in philosophy of mind, as well as having an impact on methods of psychological study.

The problem for subjectivism is a world of appearance, of external diversity and mind-independent objects, while for objectivism it is the mentality that underlies behavior — specifically, the self, thought, feeling, consciousness and degrees of the innate — or the contrast of necessity and freedom, of causal nature with a capriciousness of thought and emotion, and the dependence of mind on an impersonal world of certain fact. Science filters individual mind through a community of belief, such that the picture of the world that is built up piecemeal one brick at a time overrides the claims of any one observer. Consensual fact erodes the value of private experience. The goal of empiricism is an aggregate of isolated or local models that sums to a coherent system of explanation, beginning with the world of objects and, derivatively, accounting for the mind in terms of physical brain function.

Toward this end, a common strategy is to transpose the constituents of the world inward to the mind/brain such that the texture of an externalism prevails within the mind itself; for example, the presumption that the lines, angles, movement and color of perceived objects are recognized by brain receptors — feature detectors — which enables an assemblage of those properties to a completed perception. The input of sense data is conceived to combine to form external objects, finessing the question of "projection" of image to object, and replacing internal relations with external connections, as well as avoiding problems of duration and change, not to mention the evolutionary growth and resultant infrastructure through which mind unfolds. The extreme case is an elimination of mental properties altogether in the expectation that future neuroscience will fill in the gaps.

On the other hand, those for whom introspection and the intra-psychic are dispositive seize upon irregularities such as illusions, constancies, dreams and memories to accentuate the priority of mind, or they appeal to quantum effects

to reinforce the primacy of mind and consciousness and the commonalty of mind and nature. An emphasis on behavioral or third person data in externalism leaves out the richness of meaning, value and self-realization that are the foundations of life's concerns, while subjectivism has the obligation to explain the relation of mind to a putatively causal nature.

As noted, one casualty of the debate owing to empirical trends in contemporary thought is the description of mental content in terms of logical solids or atomic units, thus mirroring, in mind, the account of external objects. The population of mind by solid non-temporal entities — modules, computational networks — is central to an externalist account of the mind/brain state, for on this view a state can be defined by its (conscious) content, say a belief, a proposition, an after-image, a "raw feel" or quale, permitting a conformance with locality in space and instantaneity in time of entities in mind and world. If mind is constituted by the same atomic units as described in nature, it is possible to identify shared mental states across individuals with the same content; that is, different people who share the same thought can be said to be in the same mental state. Here, relations are recast as connections and the mental state is taken to consist in the isolation of decontextualized contents. To date, the tepid response to this preposterous claim is the inability of externalism to describe the inner feeling of "what it's like" to be a mind; that is, the quality of personal experience that eludes descriptions of behavior (cf. Nagel, 2012). However, an argument as to the impenetrability, except to the individual, of strictly interior content misses the mark. It is not merely the experience of qualia. The world itself should be the field of battle.

In my view, the resolution lies in an adequate theory of what constitutes a mind/brain state, one that is based on the study of mind and brain without a need to satisfy the needs of speculative metaphysics, whether from an internal or external standpoint. To anticipate, such a theory should, minimally, address the micro–temporal structure, actualization and replacement of states, the transition through unconscious layers to acts and objects, the conscious self and the duration of the present, as well as the neural processes through which the state is realized. Such an account would also address the relation of mental states to a perceptual world; specifically, the assumed transition of sensibility into mind and the formation of the world through the mental state. This shift, which is generally conceived as an abrupt dissociation, is reconceived as a continuum from mind to world, such that an endogenous configuration is sculpted to a model of reality by extrinsic sense data. With such a model, competing accounts could be re-aligned in accordance with processes through which the mind/brain state is actually constituted.

Time and Memory

Wittgenstein wrote, and psychoanalysts would agree, as would I, that a mental state begins with instinct as the *animal inheritance* traverses the evolutionary core of the brain, the drives arousing *acquired* experience and knowledge. These strands of the inherited and acquired constitute the core self, the "me," which is bound up with bodily function, immediacy and the largely innate determinants of behavior. This construct passes a liminal threshold leading to a conscious self in relation to desire for objects or conditions in the future. The self appears early in the mental state prior to thought and the endpoint of object–perception. A mental state enfolds a transition from instinct to thought to perception in a fraction of a second. Every act, object, and utterance has a brief diachronic history. Conscious experience is recollection adapted by sensation to a model of the real: perception as "vivid reminiscence" (Whitehead, 1920) or as remembrance (Merleau–Ponty, 1962), each occasion presupposing the antecedent world as active in its formation.

The relation of memory to perception is central to the nature of the state and the analysis of subjective time, dream, and the present. Early phases in the state are memorial; distal phases are perceptual. This means that to some extent we know the object before we consciously perceive it. Mental states recur in overlapping waves (James, 1890), such that oncoming states revive their predecessors to a progressively diminished extent (Figure 1). Initial revivals reach the level of iconic (eidetic) imagery, then they lapse to phases of short-term memory, and finally fall beneath revival in long-term memory. The initial renewal achieves near-perceptual clarity, then, in descent, retains the "physical" features of the object. In further descent, contents are revived to long-term memory and experiential or meaning relations, at about which point the receding state is assimilated to unconscious segments of the knowledge base. Memory is pre-perceptual; forgetting and the "components" of memory reflect degree of recurrence, and the trace is the entire process up to the endpoint of revival. On this view, the object is the outcome of an actualization in which stages in memory are recapitulated in forgetting in the order of their entrainment in perception (Brown, 2014, 2015, 2019).

The felt continuity of contiguous mental states is created out of a simultaneity in succession, with the interstices between states collapsed in the overlap. The succession, enfolded in the present, unpeels in the order of occurrence, with the leading edge of the current state trailed by descending revivals. These incomplete revivals, implicit in the present or as conscious memories, are stacked within the ongoing state and transposed to what feels like a horizontal series in time. The transition from the simultaneity of the state-series to its longitudinal unfolding occurs in a phenomenal present in which the most recent state replaces its predecessor and the most distant state falls beneath remembrance.

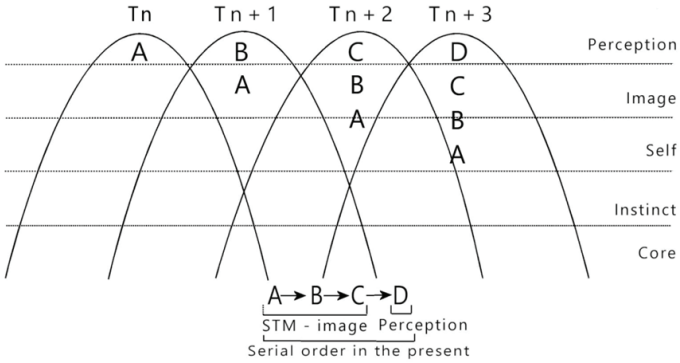

Figure 1: Successive states are embedded in the present state as incomplete revivals. The states are "stacked" in order of occurrence, but are simultaneous until the state actualizes. The actualization constitutes an epochal whole but is experienced as serial order in the present. The revival sinks to iconic, then short-term, then long-term memory, the reverse of the original perception. The overlap of states affects only the earlier segments. This accounts for the re-instantiation of early segments of instinctual drive, knowledge, character, and core values. These refer to preliminary phases in the mental state, while distal phases corresponding to final objects are not overlapped and perish to allow for novel perceptions (see text).

In Figure 1, state A is replaced by B, B by C, and so on. D is the forward edge of the perception; A is the trailing one that slips beneath recall. The disparity between D and A is present duration. The stacking of recurrent and fading states is in the order of occurrence. One duration replaces another as the earliest or most distal revival sinks below the posterior boundary of the present. In each ensuing state, a new anterior boundary appears, such that the succession incorporates another revival close to the perceptual surface. Duration is epochal, not divisible to instants. The simultaneity within and across mental states aligns with the event-series that accumulates over a "length" of physical time. The simultaneity of the series — a temporal thickness from the recent past to the forward edge of perceptual immediacy — actualizes perspectival time with past and future felt within the present moment. The past can be revived as the dominant segment in the sequence. Segments in the realization of the state are shown as a "vertical" succession in order of occurrence — the most recent are the most superficial — while the same segments, on completion of the state, are overlapping and experienced as a longitudinal series. The earlier to later transition from core to endpoint — the becoming of an epoch — creates the duration essential for a perspectival "Now."

The transition from the subjective and unconscious passes through the arousal of mental contents that reflect a conceptual and an affective complement. In human mind, the transition from self to objects gives consciousness of the world. With an arousal of segments midway in the mental state, there is consciousness of thoughts and feelings in the context of object–awareness. In dream,

the pre-perceptual phase of imagery becomes more pronounced, and distorted, with the elimination of objects.

This differs completely from the standard account, in which recall is divided into components: iconic/echoic and immediate, short-term or working memory, and long-term memory with a distinction between episodic and semantic or procedural and declarative. Eidetic or iconic imagery has a pictorial quality that rapidly fades. Short-term memory exhibits "physical" attributes of the perceptual object. In long-term memory, memory is stored, especially its meaning or gist. The perception is *presumed* to pass from iconic to immediate memory, to short-term memory, to long-term memory, from a physiological stage to consolidation and storage. Dream is a transform of memory, perhaps serving to consolidate certain of the contents of daytime perception. However, commonly it is the least-noticed fragments that recur, which may run counter to the concept of consolidation. According to this model, memory is post-perceptual, recall is retrieval from a file, and forgetting is due to interference and trace decay. This outline of memory processing, though considerably refined over the years, has not been seriously questioned. Microgenetic theory (Figure 2) reverses the conventional account, such that the same sequence in perception occurs in forgetting and recall.

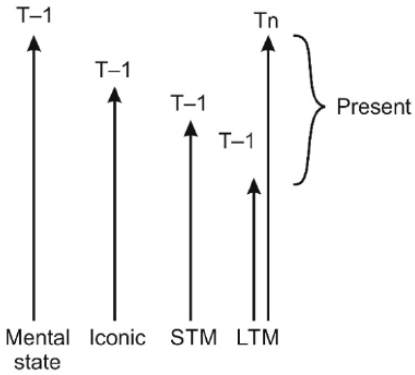

Figure 2: The mental state at T–1 is a transition from drive to self through imagery or its substrates to the object world. The state recedes in successive revivals, first to iconic recall, then short-term memory, then long-term memory, finally beneath the floor of recollection. Revival of states traverses the same phases as in the original perception. Put differently, forgetting uncovers the sequence of phases in perception. The present is extracted from the disparity between the perceptual surface and the floor of remembrance. In this model, the transition from drive to object in the mental state is that of earlier to later in physical time, while the present is an illusory span over the simultaneity of a succession of states that accounts for subjective or perspectival time.

In dream, the absence of objects explains the arousal of imagery at earlier segments. Imagery can be evoked by the lapse in revival to the corresponding segments; or the substrates of those segments, when not aroused, serve to guide

and constrain the final object. On waking from a dream (see below), the initial revival to iconic memory explains the common experience of full recall for a fleeting moment as the attenuated dream state is replaced, and revised (interference) by waking mental states.

Without a present, self and mental content are not possible and an organism is an entity in physical passage. The duration of the present is articulated by conscious imagery: the self, which arises at the liminal boundary of the mental state, anchors the subjective aim. Mental phenomena require duration, while duration without content collapses to the relative immediacy of animal mind. The duration can be sustained by ongoing perceptions and/or by mental phenomena. Probably a present of limited duration is available to some animals. A carnivore on the hunt is unlikely to desist with a brief gap in olfactory stimuli. In human mind, the self is reinstated in every act of cognition. Mental content is essential for a self to know it is conscious of objects — not simply aware of them — and objects are essential for a self to have something to be conscious of; that is, waking consciousness is sustained by objects and/or images which, when objects are eliminated, leads to dream.

The mind/brain state consists in a transition from drive to actuality over phases. Forgetting is not trace decay but incomplete revival that gradually fades from the near-actual of immediate memory to earlier phases of long-term or experiential memory. The anterior boundary of the present is fixed by perception; the posterior boundary is elastic, contracting in dream and pathology, expanding with practice and meditation. The duration varies for the material to be recalled and the capacity to recall it. Consciousness of a melody is greater than for a series of random tones; a sentence is greater than a list of unrelated words. Lashley (1951, p. 120) illustrated this phenomenon with the spoken phrase "rapid righting with his uninjured hand saved from loss the contents of the capsized canoe." The duration of the present may extend well into the past, for example, a composer who, on hearing a piece of music, is able, later, to write it down. In sum, an object incorporates a micro–temporal history that passes from long-term or experiential memory (world knowledge) to short-term memory, to iconic memory as the immediate predecessor of perception, and finally to the object world. These phases are uncovered in forgetting as revival occurs in the reverse order of the original traversal; that is, first iconic, then short-term, then experiential memory.

Drive

The fundamental shift in the origin of drive is from the circularity of reflex (Weiszaecker, 1939/1958) to the emergence of a simultaneous act–object. The reflex is a self-contained concatenation of stimulus–response or causal pairs where stimulus elicits a response that serves as a stimulus for another S–R reaction. The organism achieves freedom from the circularity and inevitability of reflex by a co-incident arousal of act and object. The initial phase is a transition from reflex

to representation (Figure 3). The developing act and object, liberated from the seriality of reflex, undergo a synchronous transition over a succession of phases in the mental state.

In this shift, small (internuncial) brainstem cells intercalated between the limbs of a reflex arc, which form a pool from which a simultaneous act/object arises, may be the decisive factor. The construct arising from this kernel of cells is presumed to constitute parallel systems for action and perception — endogenous, hierarchic — surrounded by extrinsic multi-tiered systems for sensibility — successive constraints on percept-formation — and physical keyboards for motor discharge. Intermediate phases are substrates in the realization of acts and objects, or they are aroused as intra-psychic content — emotions and concepts — in the context of a completed object perception. The supposition is that act and object arise from a common midline source, with feelings and concepts as intermediate phases in the course of actualization. A model for the unified act/object is the optic grasp of a frog catching a fly, in which the target is seen at the same moment the tongue darts out. The concept of an action system stratified over the neuraxis in evolutionary layers from ancient to recent was postulated by Yakovlev (1948) and extended by Bernstein (1967).

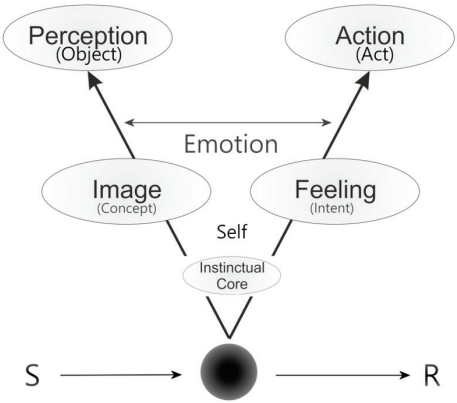

Figure 3: Acts and objects develop in parallel out of an instinctual core, traversing substrates of imagery and emotion. The percept-development transports drive-categories through concepts to objects. The act-development transports drive-impulse through feeling to acts. Concepts give the quality of emotion. Feeling gives the intensity.

Parenthetically, the same organization was proposed for the posterior and anterior systems in language (Brown, 1988); that is, a temporal–parietal system for word formation and perception, and a frontal system for grammar and articulation, with connections between them for synchronization at successive phases. Transcortical connections serve to keep the systems in phase. An utterance is

the outcome of a parallel realization of act and object development, not a transmission from a posterior to anterior system. The anterior or action component develops out of rhythmic levels that lay down the prosodic or intonation pattern, the posterior perceptual component is derived through lexical concepts. The process leads to a phonetic (anterior) and phonemic (posterior) endpoint. Speech has its onset in breath groups linked to respiratory timing arising at a depth of process. In contrast, concepts are frames of potential pre-perceptual images that actualize in objects.

Desire

The immediacy of the drive–categories transitions to the desires, which relate to future or not yet acquired items or states. The transition is that of a category/member shift, such that the limited repertoire of the drives distributes into the diverse objects of desire, and finally into the multiplicity of the world. The internal process is constrained by experiential knowledge, values, beliefs, and habits, while the final phase is constrained by sensibility. The arousal of introspective content occurs in two ways. First, there is the evolutionary account, or the basis of a progression from animal to human mind. Second, there is the approximation of segments in the mental state that correspond to self and image. This occurs, for example, in dream when the perceptual endpoint does not occur with actualization of antecedent phases of potential imagery. This can also occur in forgetting, as mental states recede to earlier levels, and evoke memorial and imaginal contents otherwise buried in conscious mentation.

From Physical to Perspectival Time

The condensation of succession to simultaneity, and the revival out of simultaneity to serial order — the recollection of the past in the present in the passage from drive to object — are critical problems for any account of the origin of the present. In the sequence from onset to actuality, a completed mind/brain state becomes an epoch that perishes and is replaced by its successor, with mental states "stacked" in the order of occurrence (Figure 1). Each recurrence differs in the addition, to the present, of a proximal phase and the loss of a distal one. The transition from core to surface, a partition from one phase to the next, constitutes "a concrete slab of nature limited by simultaneity" (Whitehead, 1920, p. 53). Within the state there is simultaneity in an epoch of successive phases, and in the present, succession in the simultaneity of the now.

The transition from core to surface can be interpreted as a succession in physical time from before to after or from earlier to later (McTaggart, 1934/1968). The passage over phases in physical time shifts the simultaneity of the epoch of the state to that of present duration, which is extracted from the disparity between the

perceptual endpoint and its distal recollection, that is, between self and object. This creates an epoch that enfolds multiple receding states at different phases of revival, giving subjective duration and an illusion of perspectival time. The weaker the revival, the earlier the prior state and the closer to long-term memory, while states at the endpoint are replaced by the oncoming future. The present is a simultaneous apprehension, in duration, of a sequence of states, some of which are proximate to objects, others to memory, with contents arising in the approximation of receding states to pre-perceptual levels of imagery and pre-action levels of feeling, and by segmental retardation of transition; that is, the phenomenal present incorporates successive phases in the mental state — concepts, emotions, images — the substrates of which are usually traversed without awakening their mental correlates. These phases actualize as conscious ingredients in the momentary epoch.

In order to more closely examine subjective time experience, the duration of the present and the relation to memory, let us assume a stacking of prior states in the current epoch with progressive incompleteness in revival (Figure 1). The before/after succession does not exist in subjective experience until it actualizes in waking consciousness, at which point earlier segments become contents in the present. That is, half a mental state does not exist until the state is actualized. The transition in the state is epochal, and an epoch of succession is simultaneous until completion. Since the duration of the present is extracted from a disparity across states (actualities, epochs), it too is epochal. Actualization shifts the simultaneity in the epoch — the relation of immediate to an embedded past state — to consciousness of temporal order. The stacked series is then apprehended as a continuous sequence. The duration of the mind/brain state, estimated at about 0.1 seconds of (clock) time, implies that the present, estimated at 2–10 seconds of clock time (James, 1890; Pöppel, 1988; Varela, 1999) incorporates, on average, the revival of 20–100 mental states, with the duration determined by the number of states incorporated. The duration is not divisible into instants, with boundaries changing as new perceptions replace those on the forward edge, and the fading states slip beneath the floor of recollection. The receding state descends to pre-perceptual segments; together with neotenous activation, this can arouse the verbal and visual imagery of thought and recollection. The image has a greater memorial or perceptual quality depending on the depth of arousal. A memory image that is productive is a thought; a thought that is reproductive is memorial.

The overlap of states accounts for the assimilation in each state of its predecessors. Within each state, preceding actualities are revived less and less over time, such that the present state contains the incomplete revivals of prior states, until the revival does not exceed a certain threshold where, largely forgotten and at a depth at which access is limited, it guides, as experiential knowledge, the arousal of each new state. Immediately prior states are close to the endpoint of perception; those more distant assume an earlier position in the succession. This accounts for stacking in order of occurrence. Think of a melody in which each

tone corresponds to a mental state. The mental state (tone) recurs less and less completely in ensuing states, and the series is held in succession until it actualizes in order. The earlier the tone in the succession, the more it is like an image. The more recent in succession, the closer the tone is to perception.

The present is a rolling duration as one present "slides" over another. As the earliest or most distal revival sinks below the posterior boundary, the succession gains another revival close to the perceptual surface. Once an epoch actualizes, the simultaneity of the accumulated mental states takes on temporal order. The revival of past states — simultaneous in preconscious mind, non-temporal in transition — serializes in the temporal thickness of the present. This provides a conscious series from some point in the recent past to the forward edge of immediate perception. The disparity between anterior and posterior limits creates a specious present analogous to the illusion of a spatial image in binocular disparity. The duration of the present encloses phases in the immediate past that are relatively superficial in a descent to the liminal self. Revivals close to the perceptual endpoint — at the anterior boundary of the present — approximate the clarity of perceptual reality.

Passage in the world is realized in transient bursts of perception that gradually recede in each recurrence. A mental state is added to an epoch of duration as the trailing state recedes into experiential or world knowledge. Physical passage is bracketed by the present as novel moments appear. The "moving finger writes … and moves on," while the present, which seems to move in concert with the world, merely replaces the forward state and loses the posterior one in a new epoch. The individual history is the potential for novelty constrained by experience, while diversity at the surface — the external world — is constrained by adaptive sculpting.

Duration is essential for the concepts of time, eternity, and an open future, which animals, immersed in nature, are unlikely to have in spite of building nests and storing provisions. Geological time is a product of learning, but memory, incessant change and awareness of aging give a sense of time perishing. The feeling of subjective time owes to a present that is a "travelling container" of all thought and perceived events, with duration a transient window on a segment of eternity. The vague shifting boundaries of the present give a past that is receding and a future that is constantly refreshed, an intuition of time without end, punctuated by events but felt as a whole, a moment in a great sea of time, an oceanic time, around an isle of the present in which events rise into consciousness and recede.

Dream

Since Freud and Kraepelin, and before them Shakespeare and ancient philosophy, so much has been written of dream — its physiology, function, symbolism and meaning — that another interpretation would seem to be superfluous did it

not offer a new perspective on this universal phenomenon of human (and conceivably animal) experience. The central phenomenon of dream is the visual or verbal image, though the deaf may dream in sign and cases of cortical blindness may have purely auditory or verbal dreams. Images are commonly vivid, like hallucinations that can be more vivid than objects in waking. The content may be banal, fantastic or creative, pleasing or frightening, with many anecdotes of problem-solving and creativity in dream and transitional states.

Dream images rapidly come and go without the stability of objects though recurrent dreams are not uncommon. The images appear real though not object-like in their realness. The feeling of reality is due to a conspiracy of the senses, not the reality of the image. Similarly, a visual hallucination of the face may seem unreal until it is joined by a verbal hallucination and the face begins to speak, at which point the hallucination is judged to be real. This shows that a judgment of the real is independent of the image on which that judgment is made. With a loss of the perceptual endpoint, the pre-perceptual imagery of waking thought, less vivid and closer to reality, achieves the quality of dream images, fleeting, fluid, and mutable with unstable boundaries. Like scenic hallucinations, they can melt into a space that is foreshortened, egocentric, lacking in depth, palpable and viscous, not the empty space of waking consciousness. Generally, dream images differ from waking hallucinations in mobility, meaning-content and entrainment of all perceptual modalities, while hallucinations tend to be static, often of the face and torso, verbal in psychosis, visual in drug-induced hallucinations or with brain lesion. The psychotic hears voices; the dreamer has visions. All that we know of dream imagery is what is retained on waking, usually for seconds, then mostly forgotten save dreams that, for one reason or another, are fully recollected and engraved in memory. Jung's full recall of lengthy dreams is unusual in this respect. Dream is the main, though not only, evidence for unconscious cognition. There are two issues: the existence of an unconscious in relation to consciousness, and the occurrence of mental activity that is ordinarily inaccessible to waking mentation. An unconscious inferred from dream might be dismissed as neural firings or an invention on waking. Arguments for an unconscious, or for unconscious cognition, include a variety of mental phenomena not readily explained as constituents of conscious thought, such as irrational, neurotic, and psychotic behavior, presuppositions, intuitions, conflicts, core beliefs, and values that go into character, compulsions, and the impact on the personality of long-forgotten memories. These phenomena cannot be ascribed to waking ideation but are evidence of what is beneath conscious thought. There are also experimental studies on masking, priming, or blindsight that point to unconscious cognition. Moreover, consciousness would seem to be essential for an unconscious. It is not likely that, in an unreflective person, unconscious imagery of the type in dream, including thought and memory images, occurs during waking perception but rather,

that the physiologic substrates of the (potential) image, which are traversed in the realization of an object–perception, exert an influence on conscious thought and behavior.

The Self

Though not the self of wakefulness, the experience of a self in dream cannot be doubted. The dream is not an indifferent stream of images that passes without an observer. The dream is my dream and experienced as something I perceive and participate in. The pleasure or fear in a dream belong to me. When someone experiences near-death in a nightmare or a child cries out in panic in a night terror, it is clearly a personal event. However, there are marked differences in the conscious and unconscious self. Unlike the waking self, the self of dream lacks the feeling of agency and is unable to predict or avoid oncoming events, to remember, to effect or resist them, to plan, deliberate, decide, judge, anticipate, or regret. There is no analysis of meaning *during* the dream though a dream can be felt as meaningful. Rather, the self is swept along by events without a sharp distinction from the imagery, nor as in waking a distinction of inner and outer. The separation of self and image is rudimentary. The brief duration of the dream present, and the lack of objects, tend to bring self and image closer. The lack of a past in dream, even if the dream itself is memorial, means the self is unsupported by experience or world knowledge and is essentially floating in a truncated mental state. The dream is condensed in an immediate present, with images that have the reality of objects but are not perceived as external and independent of the self. The surfacing of the dream self in psychotic cases may be the basis of paranoia with the self a passive victim to its own imagery.

Dream and Simultaneity

For many, dream has been conceived as non-temporal or timeless (Freud, 1955/2010; von Hartmann, 1868/1931) without a past or future, and a present of limited duration that passes in rapid replacement. The attention of the dreamer is focused on the imagery without recall of prior images or past events. The dream-time resembles in some respects the timelessness of myth in being out of time, with events occurring at multiple times and spaces. The illogic of events that defy common sense and physical laws, as well as having an historic quality relating to the life of the dreamer, are also similar to myth. The paradox is that the dream, if timeless, does have a narrative order. Some claim that dreams begin with ordinary events and culminate in a peak experience; REM studies, which dissociate from dream (Solms, 2000), appear to track the dream in real time. However, even if this is so, it does not refute the fact that dream serializes on waking. How do we resolve the sequence of dream narrative with the claim of timelessness?

However, dream is not timeless. Succession is preserved as simultaneity with possible revision on waking. This helps to explain the incorporation in dream of external events, for example in one of my dreams, hearing church bells integrated into a dream narrative when the alarm clock rang. Another time, asleep during a thunderstorm, I awoke to a tremendous clap of thunder that was felt to occur, without a gap, immediately after hammering a nail. The provoking event (thunder) was transformed in the dream image (hammering) yet was perceived, on waking, to occur after the image it provoked. The suspension in simultaneity of dream events permits revision of the events and their sequence on waking, when temporal order is achieved. Of interest, in non-REM sleep, conversation can occur among sleep-talkers (Arkin and Brown, 1971).

Commonly, on waking from a dream there is a moment when the dreamer apprehends the dream as a whole. Attempts to recall events usually result in forgetting. This can be explained by the revival to iconic or "sensory" memory, which shares the features of a glimpse of the entirety and loss of the whole on selection of detail. Thus, in experimental studies, if a subject is briefly shown a 3 X 3 matrix of letters, there is momentary recall of the whole. The subject can recall a vertical, diagonal, or horizontal column but other letters rapidly fade away. The revival of dream to iconic memory on waking explains a grasp of the whole that fades in forgetting and by the interference of object–perceptions.

In dream, the abeyance of objects at the surface of the mental state removes constraints on pre-perceptual configurations. This allows a resurgence of imagery unmodulated by adaptation to reality. Dream present still has its anchor in the lapse of mental states, but the anterior boundary recedes to imaginal content. This leads to a now of brief duration, a prominence of meaning-relations and a fusion or substitution of disparate images by shared attributes.

References

Arkin, A., and Brown, J. (1971). *Aphasic speech, schizophrenic speech, sleep speech and sleep-talking.* Bruges, Belgium: Association of Psychophysiological Study of Sleep.

Bernstein, N. (1967). *The coordination and regulation of movements*. London: Pergamon.

Brown, J. (1988). *Life of the mind.* Mahwah, New Jersey: Erlbaum.

Brown, J. (2014). Feeling. *Journal of Mind and Behavior, 35*, 1–21.

Brown, J. (2015). *Microgenetic theory and process thought*. Exeter: Imprint Academic.

Brown, J. (2019). *Mental states and conceptual worlds*. Eugene, Oregon. Wipf and Stock.

Freud, S. (2010). *The interpretation of dreams*. J. Strachy (Ed.). New York: Basic Books. (originally published 1955)

James, W. (1890). *The principles of psychology* (Vol. 1). New York: Henry Holt and Co.

Lashley, K. (1951). The problem of serial order in behavior. In L. Jeffress (Ed.), *Hixon Symposium*: *Cerebral mechanisms in behavior* (pp.112–146). New York: Wiley.

McTaggart, J. (1968). *Philosophical studies*. New York: Books for Libraries. (Originally published 1934)

Merleau–Ponty, M. (1962). *Phenomenology of perception.* London: Routledge.

Nagel, T. (2012). *Mind and cosmos*, Oxford: Oxford University Press.

Pöppel, E. (1988). Time perception. In *Encyclopedia of neuroscience* (Vol. 2). Boston: Birkhauser.

Solms, M. (2000). Dreaming and REM sleep are controlled by different brain mechanisms. *Behavioral and Brain Sciences, 23*, 843–850.
Varela, F.J. (1999). The specious present: A neurophenomenology of time consciousness. In J. Petitot, F.J. Varela, B. Pachoud, and J.-M. Roy (Eds.), *Naturalizing phenomenology* (pp. 266–314). Redwood City: Stanford University Press.
Von Hartmann, E. (1931). *Philosophy of the unconscious* (Vol. 1–3). London: Kegan Paul. (Originally published 1868)
Weiszaecker, V. von (1958). *Le cycle de la structure*. Bruges, Belgium: Desclée De Brouwer. (Originally published 1939)
Whitehead, A.N. (1920). *Concept of nature*. Cambridge: University Printing House.
Whitehead, A. N. (1933). *Adventures of ideas*. New York: Free Press.
Yakovlev, P. (1948). Motility, behavior and the brain. *Journal of Nervous and Mental Disease*, *107*, 313–335.