

YOGIC CONTRIBUTIONS TO A COMPARATIVE
PSYCHOLOGY OF A KNOWLEDGE PROCESSES

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"Truth is not that which is demonstrable, truth is that which is ineluctable--that which cannot be escaped."

St. Antoine de Exubery

"'If a specific question has meaning,' says Bridgman, 'it must be possible to find operations by which an answer may be given it. No operations, no meaning!' . . . 'There are but two kinds of acceptable propositions [according to Carnap]" Formal and empirical. Formal propositions concern syntax. They state rules and procedures for combining words or symbols and have no empirical reference. Empirical propositions are assertions about the observable world and their truth or falsity can be tested by means of observational procedures. Since metaphysics consists of statements not susceptible to empirical test, it is either an array of syntactical (formal) sentences or else it is technical nonsense. Mostly it is nonsense."

S. S. Stevens (1939 & 1963)

"The theory [that the earth is spherical] is metaphysical in the simple sense that it depends upon distinguishing between appearance and reality; between what is real, as being causally effective, though it does not appear, and what appears but is not quite so real, as being causally deficient or even deceptive."

Arthur David Ritchie (1968)

Campbell (1959, 1960, 1966) has formulated an evolutionary epistemology which is based on a comparative psychology of knowledge processes. It contains as a principle contribution a somewhat overlapping and nested hierarchy of knowledge processes or modes of knowing from very primitive and fundamental modes to very complex "short-cutting" ones. The present paper uses the above cited works as a reference point, and while knowledge of these works (especially the

¹This paper was prepared in November, 1966 in connection with a course in knowledge processes at Northwestern University taught by Dr. D. T. Campbell. The author gratefully acknowledges the critical comments of Swami Bhashyananda of the Vivekananda Vedanta Society regarding the interpretation of the Eastern literature cited and the conclusions derived therefrom.

1959 reference) would be desirable, the summary of relevant features of Campbell's writings which is given herein should be sufficient to understand the present paper in this context.

Recognizing with Douglas (1963) that any serious consideration of religion or related areas is a "taboo" topic in psychology, the following formal apologetic is offered:

(a) Starting from the premise that the most functionally useful (both in a theoretical and in an applied sense) knowledge processes are those which make integral, unifying kinds of insights regarding seemingly diverse or unrelated knowledge elements or data, those processes which Western man terms "insight," "intuition," and/or "direct" knowledge would seem to be important--inasmuch as claims have been made that they exist as valid means of knowledge.

(b) Investigation of these processes is seen as especially relevant in the context of Campbell's work since he has explicitly denied their worth:

While "insight" is accepted as a phenomenal counterpart of the successful completion of a perhaps unconscious blind-variation cycle, its status as an explanatory concept is rejected, especially as it connotes "direct" ways of knowing. Furthermore, when publicized as a part of an ideology of creativity, it can reduce creativity through giving students a feeling that they lack an important gift possessed by some others, a feeling which inhibits creative effort and increases dependence upon authority (1960, p. 390).

The model . . . [makes] an effort to root out a prevailing implicit belief in the possibility of "direct" or "insightful" creative thought processes (1960, p. 398).

(c) Given that these modes of knowing are important to investigate or consider, the Yoga literature of the East seems an ideal one to investigate for at least three reasons:

(3)

1) It makes claims that such modes are possible; it describes how such modes may be acquired by any interested investigator; it contains anecdotal reports of such modes being used; and (more importantly for an "epistemology of the other") claims that a population is in existence who have mastered such modes and who presumably could be used to validate such claims.

2) As Campbell (1960, p. 391) has pointed out:

The sociology of knowledge processes makes an important contribution here: persons who have been uprooted from traditional cultures, or who have been thoroughly exposed to two or more cultures, seem to have the advantage in the range of hypotheses they are apt to consider, and through this means in the frequency of creative innovation. The more creative thinker may be able to keep in mind more such criteria, and therefore increase his likelihood of achieving a serendipitous advance on a problem tangential to his initial main line of endeavor.

3) With reference to the "taboo topic," if one is going to "sin," one may as well "sin big and enjoy it more." Consequently, when considering transcendental knowledge processes, the author deliberately chose to investigate that literature which makes the highest claims regarding such processes. The Advaita Vedanta philosophy (in the Yoga tradition) fulfills this condition since it claims nothing short of "infinite" (and/or Absolute) knowledge, i.e., the experiential realization of the unity of all things with which one becomes identified in the sense of "self-concept"--with concomitant distal knowing as a direct result. This, by definition, is the "highest" knowledge possible!

In order to ensure continuity (or to at least recognize contrast) with the philosophical bases of Campbell's theorizing, it is important to make explicit the assumptions from which he has worked. Campbell's general orientation may be termed a "Hypothetical realism," i.e., an "external world" is hypothesized in general, and specific entities and processes are hypothe-

sized in particular . . . No part of the hypotheses has any 'justification' or validity prior to, or other than through the implications [of other hypotheses]. All are always to some degree tentative. The original source of the hypotheses has nothing to do with their validity." He further expects that "There are no essential differences in primitive fundamentals between the knowledge processes of man and lower forms of animal life--at all levels knowledge is indirectly, inferentially, and fallibly achieved," i.e., no knowledge is assumed to be possible that is perfect or incorrigible. Campbell's epistemological position is both dualistic (the operational independence of "knowledge" and "that-which-is-to-be-known") and an "epistemology of the other one" (with solipsism, no effort is made to justify "my own" knowledge processes) (Campbell, 1959, pp. 156-158).

Regarding "knowledge," the ultimate referent of this whole consideration, a working definition in Campbell's behavioristic perspective is "any process providing a stored program for organismic adaptation in external environments ^{is} included as a knowledge process, and any gain in the adequacy of such a program is regarded as a gain in knowledge" (1960, footnote 2, p. 380).

The hierarchy of knowledge processes which Campbell has presented may be summarized by the following list:

1. Genetic mutation and selective survival.
2. Bisexuality and heterozygosity.
3. Nonmnemonic problem solving:
 - a) blind trial and error locomotion
 - b) vicarious locomotor devices other than "regular perception," (e.g., fish sensing their own pressure waves reflected from impenetrable objects).
4. Instinct (phylogenetic "learning").

5. (sensory) perception.
6. Learning (ontogenetic).
7. Habit.
8. Socially vicarious locomotion: observation of other's trial and error processes, well established responses, and the consequence of both.
9. Imitation.
10. Thought: both visually supported and mnemonically supported.
11. Cultural cumulation and dissemination techniques (e.g., pedagogy, archives, technology).
12. Verbal instruction (somewhat redundant with 11. but very important).
13. Social decision making.
14. Science (for present purposes, the testing of knowledge claims).
15. Computing machines.

The present paper consists of a consideration of claims made for what may be loosely termed "insight," "intuition," and "direct" perception of knowledge as knowledge processes or modes of knowing, and possible means of validating such processes, such that they may be added to the above hierarchy in the event that they can be and are validated by subsequent investigation. Webster's New Collegiate Dictionary defines intuition as "The power of knowing, or the knowledge obtained without recourse to inference or reasoning; innate or instinctive knowledge; familiarly, a quick or ready apprehension." Leaving out the familiar use and that of instinct as being previously treated modes, we may see a close proximity to insight as described by Poincare (Campbell, 1960), viz., "that knowledge which suddenly comes on one (from the unconscious)." It is hard to semantically distinguish intuition from insight, which latter term Webster's defines as "Keen dis-

cernment or understanding; penetration; also, intuition; immediate apprehension or cognition.

Since each of these terms appear to be co-defined by each other, it would appear that the choice of these terms to describe the possibility of more "integral," but separate knowledge processes was a bad one, i.e., although they have somewhat differing common usage, they overlap too much to be operationally distinguishable. Therefore, rather than deal with these terms separately, it is preferable to follow the method of the Yoga, which sees knowledge processes more as non-discrete points on a continuum, as will be developed below.

"In the Advaita Vedanta [see footnote 3], epistemology is inseparable from metaphysics" (Satprakashananda, 1966, p. 15). Any attempt to understand the epistemology of the East must start with a metaphysical recognition of the essential mind-body dualism which it assumes, and a concomitant recognition of what is referred to as "mind" (chitta--a more accurate Western rendition might be "soul"). Huxley (1944 a, p. 13) has given a concise summary of the fundamental doctrines which underly such a position:

(1) The phenomenal world of matter and of individualized consciousness--the world of things and animals and men and gods--is the manifestation of a Divine Ground [Absolute Consciousness] within which all partial realities have their being,² and apart from which they could be nonexistent.

(2) Human beings are capable not merely of knowing about the Divine Ground by inference; they can also realize its existence by a direct intuition, superior to discursive reasoning. This immediate knowledge unites the knower with that which is known.

(3) Man possess a double nature, a phenomenal ego and an eternal Self, which is the inner man, the spirit, the spark of divinity within the soul. It is possible for a man, if he so desires, to identify himself with the spirit and therefore with the Divine Ground, which is of the same or like nature with the spirit.

²See pages 8 and 10 regarding infra-human organisms.

As a further attempt to delineate this conception, it is desirable to see the manner in which they posit consciousness to operate. Coster (1934, p. 97) has presented an overlapping five-step hierarchy of "levels of consciousness" that the Hindu philosopher recognizes, and which are graphically presented in Figure 1.

The states of consciousness shown in the diagram above the horizontal line represent the Hindu idea of what we call the "immortal soul," or the "spirit"--that which is said to survive death, the ego, the sense of personal identity. Those below the line represent a reflection of the self, its behavior and appearance in everyday life, what Jung would call the persona (pp. 97-98).

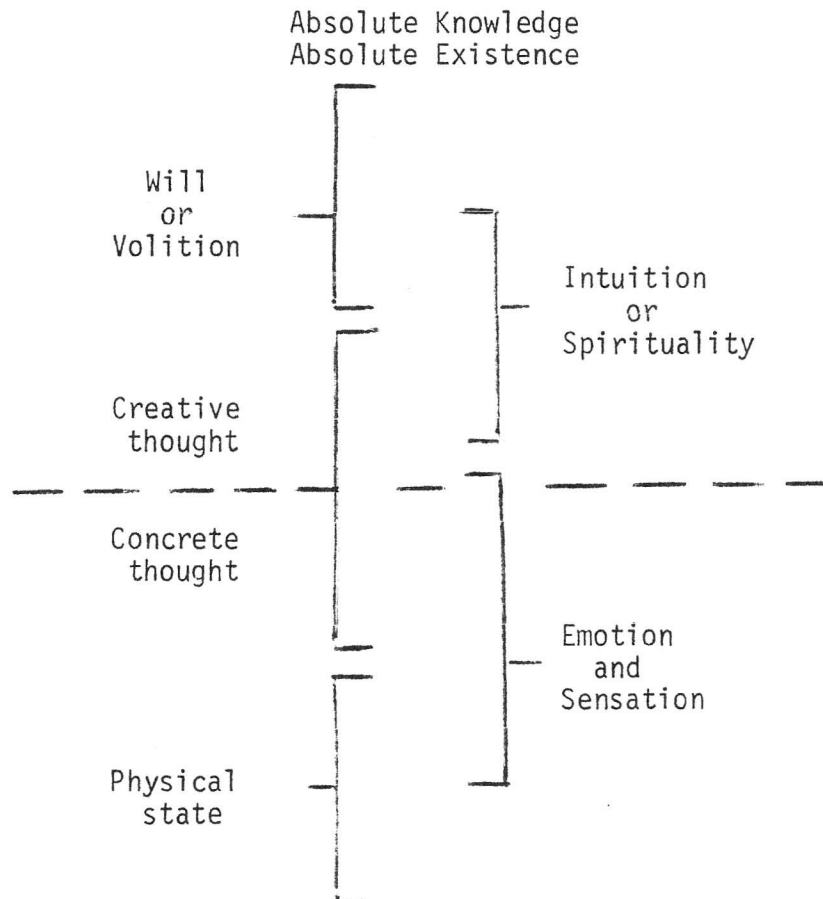


Figure 1. Overlapping states of consciousness which are said to be representative of Hindu philosophy. The "Absolute" categories have been added by the present author to conform to citations made in the text that follows.

While it is necessary to recognize that such a sweeping generalization (i.e., "Hindu philosophers") is a dubious proposition since Indian or Hindu philosophy is at least as varied if not more so than its Western counterpart (ef. Satparakashananda, 1966), such a graphical presentation may at least give a "feel" for the way in which consciousness is typically construed as being a continuous hierarchy by the Yoga related systems.³

Vivekananda (RY, p. 17)⁴ states that:

According to the Sankhya philosophy, upon which Yoga is based, the genesis of perception [sensory or extra-sensory] is as follows: the affections of external objects are carried by outer instruments to their respective brain centers or organs, the organs carry the affections to the mind, the mind to the determinative faculty, from this the Purusha (the soul) receive them, when perception results. Next he gives the order back, as it were, to the motor centers to do the needful. With the exception of the Purusha, all of these are material but the mind is much finer matter than the external instruments. That material of which the mind is composed goes also to form the subtle matter called the *Tannmatran*. These become gross and make the external matter. That is the psychology of the Sankhya. So that between the intellect and the grosser matter outside there is only a difference of degree. The Purusha is the only thing immaterial.

In this system, the "mind" (chitta) is conceived as being by nature formless--taking on the form of that which is perceived. In order for perception to occur, the mind must first become sufficiently fluid, or perhaps "non-rigid," (relatively less affected by previous thoughts, ideas, or impressions) to allow the new "forming" process to occur. By this formulation, the amount of perceptual distortion that occurs is a function of the degree of "rigidity" (more

³Although not previously pointed out, the present use of "Yoga" as a generic term is a decided oversimplification, but one which is appropriate for present purposes. Satprakashananda (1966, p. 311) gives a summary account of the twelve major schools of Indian philosophy with regard to their respective epistemologies. Of these, the Samkhya, the Yoga, and the Advaita (non-dual) Vedanta may be considered synonymous herein due to the similarity with which they make transcendental knowledge process claims as well as the methods by which such perception and knowledge processes are attainable.

⁴Since some of the references cited do not have an original publication date listed, such works will be referenced by the initials of their title.

accurately, the amount of "previous formedness" that is not given up) by the chitta. This is the reason that so much emphasis is placed on meditation on the formless as a necessary pre-requisite to realizing the Absolute or other type "direct" knowledge (Vivekananda, RJ; Prabhavananda & Isherwood, 1953).⁵ Stretching this formulation to the logical limit, it logically follows that if the mind can be completely quieted or made completely "formless" with respect to past experience, it will then perfectly perceive that which is concentrated on-- which is precisely the manner in which the Absolute (formless, non-manifest Reality) is said to be perceived (as well as "lessor" or "relative" distal objects--as will be discussed after a consideration of Absolute and "Infallible" perception):

There is another Samadhi which is attained by the constant practice of cessation of all mental activity, in which the Chitta retains only the unmanifested impressions. [the Yoga Sutra of Patanjali, No. I-18; to which Swami Vivekananda comments] This is the perfect super-conscious Assprajnata Samadhi, the state which gives us freedom [including Absolute Knowledge]. It is very difficult to do so, although the method seems easy. The method is to meditate on the mind itself, and whenever thought comes, to strike it down, allowing no thought to come into the mind, thus making it an entire vacuum . . . When persons without training and preparation try to make their minds vacant, they are likely to succeed only in . . . [making] their mind dull and stupid, and leads them to think they are making a vacuum of the mind.

(Vivekananda, RJ; pp. 144-145)

The above formulations give a description of the generic knowledge processes being investigated. Considering Campbell's explicit denial of "direct" and/or "infallible" knowledge, we may next consider this issue. The claims for infallibility of "direct" knowledge (which is obtained by various types of "samadhi")⁶ made by adherents of these systems is somewhat confusing--perhaps even contradic-

⁵It is interesting to note the isomorphism of this model to the current Western theories of perceptual distortion for "relative" (physical, or distal object) knowing.

⁶Due to typographical error, this footnote is given on the next page.

tory. On the one hand we have a description (given immediately below) the "relative" part of which is more in keeping with Western thought. On the other hand, claims are made for various types of samadhi in which relative knowledge is held to be infallible. These positions will be presented in turn.

Absolute knowledge does not mean the knowledge we know, not intelligence, not reason, not instinct, but that which when it becomes manifested we call by these names. When that Knowledge Absolute becomes limited we call it intuition, and when it becomes still more limited we call it reason, instinct, etc. The Sanscrit term for Knowledge Absolute is Vijnana. The nearest translation of it is "all-knowingness." There is no combination in it--it is in the nature of the Soul . . . Absolute Existence, Absolute Knowledge, and Absolute Blessedness are not qualities of the Soul, but its essence; and there is no difference between them and the Soul. . . That Absolute which is limitless, which is unmixed, uncombined, which knows no change is the Soul; and that Real Existence when it gets "mixed up," muddled up, as it were, with the elements of nature is what we call human existence. It becomes limited and manifests as plant life, animal life, human life,--just as infinite space is apparently limited by the walls of this room, or by any other enclosure.

(Vivekananda, SPR, p. 18; italics added)

It is therefore clear that Vivekananda does not make any claims of infallibility for any type of knowledge which can be externally demonstrated, since it of necessity must be demonstrated through finite means, i.e., the organism. An alternative conclusion is possible, however, from the literature of the same (Advaita Vedanta) school to which Swami Vivekananda belonged--a conclusion which may be made for both "relative" and "Absolute" states of samadhi.⁶

Just as the pure crystal takes color from the object which is nearest to it, so the mind, when it is cleared of thought-waves, achieves sameness or identity with the object of its concentration. This may be either a gross [physical] object, or the organ of perception, or the sense of ego. This achievement of sameness or identity with the object of concentration is known as samadhi.

(Prabhavananda & Isherwood, 1953, p. 79)

⁶In technical usage the terms "Yoga" and "samadhi" are somewhat interchangeable. Both refer to "union" or the process of becoming "one" or the state of "oneness" (with the referent being an external object or idea in the case of "lower" samadhi, but not in the case of the "Absolute," since the "Absolute," by definition transcends any limitations of space or time or any other "relative" dimension.

The Yoga Sutras of Patanjali go on to distinguish "mixed with awareness" samadhi from "unmixed with awareness" samadhi. In the latter type of samadhi, Prabhavananda and Isherwood (1953, pp. 81-82) comment:

Our achievement of identity with the object of concentration is now unmixed with awareness of name, quality and knowledge.⁷ Or, to put it in another way, we are at last able to still the thought-waves which are our reactions to the object, and to know nothing but the object itself, as it truly is: "the-thing-in-itself" to use Kant's famous term. Kant maintained, quite rightly, that the "thing-in-itself" cannot possibly be known by the sense or the reasoning mind, since the senses and the reason can only present us with their own subjective reactions . . . Kant, who did not admit the validity of any experience other than that of the senses or reason was therefore forced to conclude that the "thing-in-itself" is unknowable. Here, Patanjali disagrees with him. Patanjali tells us that there is a higher kind of knowledge, a transcendental knowledge, beyond sense-perception, by which the "thing-in-itself" can be known.⁸

This seeming impasse can be resolved in the following manner. In contrast to Campbell's required operational distinction between "knowledge" and "that-which-is-to-be-known," the Advaita Vedanta, for similar "relational" knowledge specifies four distinct factors: the Knower, the object known, the process of knowledge, and the resultant knowledge (Satprakashananda, 1966, p. 16).⁹ While it makes "intuitive" sense that "I" (the knower) cannot realize the "thing-in-itselfness" of another (the object known and still be separate) i.e., I can taste the salt and it is it and I am I, whereas if I am the salt, then it and I are one,

⁷Alan Watts has coined the apt phrase, "tasting the salt versus being the salt!"

⁸It should be pointed out that Vivekananda who was previously quoted as reaching an opposite conclusion to the one arrived at here has also translated the Yoga Sutras of Patanjali (which is included in the RY reference) which is the Sanskrit material being quoted and commented on. In neither his translation of these particular Sutras (I-41, 42, & 43) nor in his commentary on them did he indicate that samadhi of "gross" (physical) objects leads to infallible "thing-in-itself" type knowledge. His usage was instead "concentration with question" as opposed to "concentration without question" (of meaning of the meditated object).

⁹This reference is especially recommended to the reader who is interested in a summary of the Eastern treatment of epistemological problems including relational, sensory perception, the problems of illusions, etc.

and to assert that "I" know "it" is a contradiction in terms in the sense of "I" as a separate "knower"--it is precisely this sense of "I-ness" which is not present in the "unmixed-with-awareness" type samadhi state (i.e., "unmixed with awareness of name and quality"). Hence, to try to force the relational factors of knowing in this situation is to commit a category error. This does not deny that at some level (viz., the level of Absolute Consciousness, that the "salt" and "I" are not "one," but at that level it is said that properties, qualities, etc. of being are not distinguishable, therefore the problem of infallible "thing-in-itself" perception is a pseudo-problem caused either by a category error or a lack of recognition of the finitude, hence fallibility of a physical organism as a reporter or transducer of that which may, in theory, asymptotically approach "direct," "infallible," or "Absolute" perception.⁹)

In any event, there is simply no way of operationalizing such a proposition--primarily because one cannot generate an independent criterion for "thing-in-itselfness"--other than another thing-in-itself, but which would, by definition, have to be the same self! Indeed, if one could, the problem would be solved. The problem of such infallible perception cannot be solved or validated as possible (subject to Heisenberg limitations) except by subjective experience and its consequent commitment to the position--thus the author concludes with both Vivekananda and Campbell that no "relational" knowledge can be infallible, and (with Vivekananda) that about Absolute Knowledge we can say nothing, since it is "unsayable."¹⁰

⁹The use of the qualifying term "asymptotically" is due to considerations of Heisenberg's principle of uncertainty where are discussed in the Appendix of this paper.

¹⁰The whole issue of infallibility of knowledge seems reminiscent of the anecdote about the stereotype philosopher who, not having the price of admission to the ball game watched through a knot-hole in the fence--only to jump up and down excitedly and exclaim "Watch your words, boys, watch your words!"--whenever the action got exciting. (To which category the author is somewhat inclined to place this whole section of the paper.)

Since such claims of "infallible Absolute" knowledge cannot be tested by a behavioristic epistemology of the other, we next turn to other knowledge claims of the Yoga system which may be more amenable to such testing and possible validation.

Prabhavananda and Isherwood (1953, pp. 182-201) give a whole list of "supernatural" abilities (generically termed "powers") which Patanjali (as well as e.g., Vivekananda, RJ; Yogananda, 1959) has said to be at the disposal of the adept yogi and a result of meditative practices. They range from being able to concentrate on and hence understand words in foreign languages or the languages of animals (p. 182); and levitation (p. 192); to the "giving up of such powers once they have been attained" (p. 194);--from which liberation (total realization) is said to follow. It is interesting to sample a few anecdotal reports in which claims "of the demonstrated" (as opposed to "of the possible") have been made--both as anecdotal evidence, and as indicative of the types of phenomena which could conceivably be subjected to more rigorous "scientific" test for validity.

Swami Yogananda (1959, pp. 117-119) relates this tale which his Guru, (master or teacher) related as having happened to himself;

"'Sir,' I said, 'I have been very sick and have lost many pounds.'"

"'I see, Yuktswar, you made yourself unwell, and now you think you are thin.' . . . 'Your health has followed your subconscious expectations. Thought is a force, even as electricity or gravitation. The human mind is a spark of the almighty consciousness of God. I could show you that whatever your powerful mind believes very intensely would instantly come to pass.'"

"Knowing that Lahiri Mahasaya never spoke idly, I addressed him with great awe and gratitude: 'Master, if I think I am well and that I have regained my former weight, shall those things come to pass?'"

"'It is so, even at this moment.' My guru spoke gravely, his gaze concentrated on my eyes."

"I instantly felt an increase not only of strength, but of weight . . . I returned to my mother's house where I stayed."

"'My son! What is the matter? Are you swelling with dropsy?'"
 My mother could hardly believe her eyes. My body was now as full and robust

as it had been before my illness."

"I weighed myself and found that in one day I had gained fifty pounds; they have remained permanently. Friends and acquaintances that had seen my thin figure were overcome with amazement. A number of them changed their mode of life and became disciples of Lahiri Mahasaya as a result of this miracle."

"My guru, awake in God, knew this world to be nothing but an objectified dream of the Creator. Because he was completely aware of his unity with the Divine Dreamer, Lahiri Mahasaya could materialize or dematerialize or make any other change he wished in the dream of the phenomenal world."

Yogananda elsewhere (1946, pp. 149-150) relates an experience which happened during his early years as a "noviate" yogi:

"Your heart's desire shall be fulfilled." Sri Yukteswar seldom indulged in riddles: I was bewildered. He struck gently on my chest above the heart. My body became immovably rooted. Soul and mind instantly lost their physical bondage and streamed out like a fluid piercing light from my every pore . . . My sense of identity was no longer narrowly confined to a body but embraced the circumambient atoms. People on distant streets seemed to be moving gently over my own remote periphery . . . The whole vicinity lay bare before me. My ordinary frontal vision was changed to a vast spherical sight, simultaneously all-perceptive. Through the back of my head, I saw men strolling far down Rau Ghat Lane, and noticed also a white cow that was leisurely approaching. When she reached the open ashram gate, I observed her as though with my physical eyes. After she had passed behind the brick wall of the courtyard, I saw her clearly still.

Sri Ramakrishna (the spiritual leader of the majority of the Swamis cited herein) also was reputed to have the power to transmit spiritual power and various experiences immediately and directly to his disciples.

Swami Vivekananda was about eighteen years old when he first went to see Sri Ramakrishna. The great Master touched the chest of the young aspirant, who at once entered into the highest state of superconscious realization immediately and directly. He lost his physical consciousness in the realization of the Ultimate Reality. (Akhilandanda, 1948, p. 195; also see Roland, 1931).

Although the literature is filled with such "miraculous" occurrences (Yogananda, [1959] is an especially rich source of such anecdotal material), only the three just given will be repeated here, for they have a common source that is of interest to an epistemology of the other: a developed master. How to define "developed master," is for present purposes problematical.

Yogananda (1959, p. 212) has given two criteria for such an identification--(1) the ability to refrain from breathing for a sustained period of time; and (2) the ability to enter at will the state of "Absolute Consciousness." The first criterion is appropriate for our purposes and is discussed below as a "physiological measure;" about the second, as has been shown, an epistemology of the other can say nothing. Akhilananda (1948, p. 196) states that "The supremely developed person not only can transmit this power [of "cosmic consciousness"] immediately and directly to a disciple who has not performed spiritual practices [primarily the discipline of meditation], but even the disciples of these great teachers can awaken latent spiritual power and give the higher realizations when they are in that particular mood." In the interest of scientific investigation, one wonders if such "powers" could be similarly delivered "immediately" to as "Philistine" a person as a skeptical (even atheistic) scientist. Regardless of the outcome of such a speculation, a number of tests are possible as ways of validating the veracity of the claims which have been presented.

Campbell and Fiske (1959) have argued persuasively for multiple methods of validation--triangulating, as it were, and asymptoting on the external "thing-in-itself," which in the present case can refer to either the process or mode of knowing (e.g., meditating to a state of samadhi) and/or to the resultant knowledge thus obtained, or the "direct transmission" of such knowledge from a "Master" to one not so developed. The author sees three independent methods of validating various of the "relative" knowledge claims as in the realm of the possible (four, if we include the results of "evolutionary selection pressure," as discussed on page 20 as admissible evidence). (1) The method of comparative anthropology. In India, two classes of scripture are recognized: the Shruti, or inspired writings which are considered to be their own authority (i.e., self-validating)

since they are the product of immediate insight into Ultimate Reality; and the Smriti, which are commentaries on the Shruti, and from them derive such validity as they have. Huxley (1944b) has compiled an anthology of the "Shruti" of various advanced religions, viz., Hindu, Buddhist, Hebrew, Taoist, Christian, and Mohamadan, and came to the conclusion that all were attempting to describe the same essentially indescribably Fact--The Absolute--with the resultant doctrines some of which were listed on page 6. The amount of cultural "cross-pollution" via sensory communication is unknown, however, to an unsophisticated reader, such as the author, this claim represents a weak or partial validation of the claim of "Absolute Knowledge" (which cannot be verified by "ordinary" scientific means)--a validation which gains credibility by the evolutionary pressure argument (which is not necessary for the types of validation discussed next). (2) The method of physiological measures. There are at least two different physiological measures which can be inferred as appropriate validators for various types or states of samadhi--(non) breath rate and Electro-encephalographic (EEG) tracings. Various sources (e.g., Yogananda, 1959, p. 114, p. 212; Vivekananda, RJ, p. 45) assert that after sufficient practice, total stoppage of the breath for a given (presumably unlimited) amount of time is not only possible, but is beneficial to "total realization,"--a definite relation being construed between breathing and mental functioning (see Vivekananda's discourse on Prana and Pranayama in the Raja Yoga).

It is also asserted (as was presented on p. 9) that in the highest samadhi, the "mind waves" totally stop. While the claim of total breath stoppage can be subjected to a "critical" test, it does not seem legitimate to propose EEG readouts as a similar "critical" test of the claim of "no thought." The latter does, however, certainly suggest an intriguing research hypothesis. Do EEG

waves reflect the degree of "depth" of meditation? This question can be operationalized quite simply by taking EEG measurements during the meditations of a developed Yogi, and correlating them with his own subjective report of the "depth" of the meditative state achieved together with his subjective time estimates for the various depths achieved after the conclusion of one "trial" (period of meditation). The present author has received informal communications that in 1963 Drs. Akira Kasamatsu and Tomio Hirai of the Department of Neuro-Psychiatry, Tokyo University, published the results of a ten-year study of EEG techniques on Zen Buddhist masters in meditation. The tracings reportedly indicated that about 90 seconds after a (typical?) Zen master begins meditation, alpha waves develop--with a slowing concomitant to deepening meditation until after about 30 minutes the alpha had slowed to about 7 or 8 c½s. What is most significant about this work (the above findings being expected for deep relaxation with closed eyes) is the report that this slowed EEG pattern supposedly varied markedly from those of sleep, normal waking consciousness and hypnotic trance, and is known in persons who have made substantial progress in meditation. There are a number of problems in such an interpretation, for any conclusion regarding states of consciousness inferred from EEG readouts alone is a dubious proposition (see e.g., Tart, 1965; Routtenberg, 1966). In any event, since the present author has not been able to locate an exact reference to the technical report of the above studies, they must be regarded as anecdotal evidence--however suggestive that EEG studies might prove a fruitful avenue for investigation of the claims regarding mental states when meditating "on the infinite." (3) The method of "critical" behavioral tests. The bulk of Western psychological and parapsychological research has been of a probabilistic nature with statistical methods necessary for estimating the likelihood of errors due to competing hypotheses. The un-

desirability of this type of research for establishing the validity of extra-sensory phenomena or "powers" as used herein has been discussed at length (see, e.g., the discussion which was carried in Science, which has been collected in the Bobbs-Merrill reprint Series #P-279). The various claims and anecdotes which have been herein presented (direct transmission from a master, and "powers" available to a developed master) were specifically selected due to their susceptibility to "critical test" experimentation. If we can obtain a master who claims to have such abilities, he can be tested for such abilities in a highly operationalized and specified manner on a pass or fail basis. The literature, however, indicates a possible problem to such a plan--those who claim to be able to perform such "miracles" may not be willing to perform them for such a purpose (an additional problem is that such masters do not typically go around "claiming" such powers--rather stressing the "spiritual" goals which are to be or have been obtained). To the (legitimately) skeptical Western scientist this may seem a cover to prevent being found out a charlatan. However, such may not be the case. Various authors (see Yogananda, 1959) report that the "truly spiritually inclined" master will perform "supernatural" phenomena only for the spiritual growth of the recipient(s).¹¹ The point is that many such masters simply operate from a different value system than does the skeptical, and admittedly materialistic (in the epistemological if not in the value sense) Western scientist. On the other hand, many others evidently would be willing to demonstrate such powers as they have, gladly, for they spend their lives doing so (e.g., the "Perfume Saint," whom Yogananda [1959] describes as creating beautiful odors [which other

¹¹In this regard it is worthwhile noting that much of the Eastern Literature cited warns explicitly about the dangers of seeking and acquiring "powers" without concomitant spiritual growth--dangers both to one's self and to others. The present author's way of perceiving this warning is the obvious answer to a simple question: "Would I like to live in a world in which all men had such powers at their disposal--given the present moral and ethical development of man in general?" (presupposing, of course, that such powers do, in fact, exist).

persons could smell and agree on] at a distance). In any event, with the presently available funds for cross-cultural research, the claims for Yogic "powers" and "supersensory" knowledge processes should be amenable to critical test and subsequent validation from an "epistemology of the other." (4) Finally, there is the method which may be termed "the epistemology of the self," in which the investigator subjects himself to the disciplines which are claimed to produce the "transcendental" knowledge processes. By a subsequent process of intersubjective validation, this "epistemology of the self" becomes an "epistemology of the other"--essentially what Dowling (1963) has termed "relationship" in overcoming the problem of solipsism, and essentially what science is about (except that which is observed here is primarily internal to the observing organism rather than external). This process is equivalent to that used by Campbell (1960) when he described introspective reports by Poincare and others regarding their creative thought processes as arguments in favor of his trial and error with selective retention theme of knowledge processes.

Inasmuch as it has now been shown that a number of the knowledge claims made by Yoga literature are, in fact, susceptible to validation by an operational and behavioristic epistemology of the other (and hence could conceivably be added to Campbell's hierarchy of knowledge processes), it is important to consider these "transcendental" modes of knowing in the context of Campbell's "blind variation and selective retention" theme. Are they compatible with this model?

It is evident that the "powers" which have been discussed conform exactly to our original definition of knowledge--"a stored program for organismic adaptation in external environments . . . which result(s) in a gain of adequacy of adptation. Further, the process of obtaining such "powers" and/or "transcendental" knowledge processes conforms exactly to the "blind variation and

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It is evident that the "powers" which have been discussed conform exactly to our original definition of knowledge--"a stored program for organismic adaptation in external environments . . . which result(s) in a gain of adequacy of adaptation. Further, the process of obtaining such "powers" and/or "transcendental" knowledge processes conforms exactly to the "blind variation and

selective retention" theme. In the absence of a guru, the process of learning to meditate (the process which is asserted to be the sine qua non for acquisition of such knowledge processes) is decidedly a blind variation process--a mental process in which that which brings partial success is successively reapplied in an asymptotic approximation to perfection. The cultural cumulation and description of techniques which aid in this procedure (e.g., the Yoga Sutras of Patanjali) conform to modes 11 and 12, and the addition of a guru who might be able to perform a short cut of "immediately given" knowledge to the "learner" does not violate the blind trial and error theme in that his knowledge was arrived at through trial and error processes somewhere in a regression sequence. Finally, it is important to note that all of these processes have been subjected "the eroding effects of evolutionary selection pressure" for centuries, and they still remain as processes for which knowledge claims are made--in a geographical area (e.g., India) where they have been continually subjected to test, for in this country they are taken seriously by many, and not viewed as "mere superstitions." This latter observation is considered to be most important in the context of Campbellian thinking, which stresses the inherent testing and eroding of processes which are not adaptive to the organism or the social system.¹²

Finally, to complete the present consideration, how best to denote these "super-sensory" or "transcendental" knowledge processes by a verbal symbol which would provide continuity with Campbell's comparative hierarchy of knowledge processes?--assuming that they should be validated in the future to the satisfaction of the type of scientific epistemology herein described. As was previously pointed out, the Western equivalents of insight, intuition, and/or direct perception are not sufficiently precise to be satisfactory. "Samadhi" may be

¹²See, e.g., Campbell (1965) especially pp. 31-34.

an appropriate term for such knowledge processes, but it is difficult to decide if it refers to a process, a mode, a state, or an end result--perhaps it refers to all four since a problem of "levels" exists in this whole area of "transcendentalism" in which semantic terms lose their ordinary properties--being poor verbal symbols of that which is essentially nonverbal. Therefore, it is proposed that the single term "yoga" (which to Eastern scholars refers primarily to the system of knowing espoused by Patanjali, but also to the "science of union" [Yogananda, 1959]) be used as an inclusive knowledge process by which transcendental or extraordinary knowledge is obtained. Such a term would remain consistent with the treatment given by Campbell (1960), viz., creative trial and error thought resulting in "insight" being isomorphic to trial and error yoga-practice which similarly results in insight or "samadhi" of various types.

In conclusion, it is evident that the Eastern yoga literature describes methods of knowing which transcend, but which are both consistent with the Campbellian model and are eminently susceptible to the type of tests which are considered appropriate for validation purposes. Regarding the issue of "infallible" knowledge, no controversy need exist since this issue may be regarded as a pseudo-problem as seen from the standpoint of a "finite" organism. The resolution of the central question raised in this paper (do such knowledge processes, in fact, exist as means of obtaining valid knowledge) must be projected into the future. Such a result should not be disappointing since it is in keeping with the Zeitgeist of contemporary psychology which defines success as the generating of new hypotheses which are subject to empirical test!

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APPENDIX

Using an appendix as a convenient method for discussing interesting points not properly belonging within the defined scope of the paper, the following thinking may be of interest to the reader.

A. A "serendipitous" research hypothesis. As a direct example of the "cross cultural" quotation given on page three, the following thinking leading to a longitudinal study is offered. Long series of experiments on transfer of training show that in order to obtain positive transfer, there must be common elements between the tasks (or skills required) in order for such transfer to take place (Mednick, 1964). If the type of skill required to master the yoga knowledge processes described by Patanjali is reduced to one word, that word would be "concentration." The mastering of the types of material to be learned in "school" would similarly seem to depend upon the ability to concentrate on such material, to the exclusion of competing thoughts of stimuli (creative type thought processes excepted). It is therefore conceivable that one could extract from the yogic instructions on meditation, etc., that which teaches heightened concentration (as Patanjali puts it, "single-pointed concentration"), leaving out any metaphysical or cosmological assertions which might contradict the particular metaphysical assumptions of the student. The hypothesis being advanced is that regular practice of such instructed concentration exercises, over the period of four years of college would result in a positive transfer to learning of curricular materials, the criterion for which would be the grade point average of students participating in this "experimental treatment." In the opinion of one exceptionally behavioristic psychologist reader, the above hypothesis is the only saving grace of this entire paper!

B. Comments on Dowling's paper. Dowling (1963) in a consideration of the contemporary state of the mind-body problem (also from the standpoint of Campbell's

psychology of knowledge processes) made several conclusions which result from modern philosophy and modern physics. Three of them are particularly appropriate to consider here for although highly unconventional from the Western viewpoint, they are highly compatible with the Eastern thinking presented in the present paper.

(1) In a discussion of determinism and predictability, Dowling states:

Another example is the universe, assumed to be determinate under the comprehensibility hypothesis. Gabor (1962) points out that LaPlace was unjustified in his inference of predictability from the justified assumption of determinism--the observant apparatus plus the data handling equipment necessary for prediction of successive states of the universe would have to be at least as large as the universe itself (p. 23).

While in no way evaluating such claims, the above is precisely what the fully realized yogi claims is the result of nirvikalpa samadhi--the infinite is realized through expansion of one's own consciousness to infinity. By such a processes, it is claimed that all knowledge including precognition (of the universe) is possible since the identity of the yogi is claimed to be one with the entire universe (and even more--with "Brahman" or "pure undifferentiated consciousness" which incidentally is said to transcend the physical universe).

(2) In light of the above, we may consider Heisenberg's principle of uncertainty for micro-level events. In a discussion of Heisenberg's principle, Dowling states the well known conclusion that this principle reduces the basic phenomena of the physical universe to a statistical basis (hence unknowable in the "particular" or discrete sense). It seems that if the yoga claims are valid, this principle is not valid for "yogic perception and/or control."

According to the Raja-yoga, the external world is but the gross form of the internal or subtle. The finer is always the cause, the grosser the effect . . . The yogi proposes to himself no less a task than to master the whole universe, to control the whole of nature. He want's to arrive at the point where what we call "nature's laws" will have no influence over him, where he will be able to get beyond them all (Vivekananda, RJ, p. 13)

In applying Heisenberg's principle to "Yogic perception" one must realize that this principle is a "relative" one, i.e., one which considers the relative grossness of the "interferring stimulus" to that of the body being interfered with--it applies to the action of e.g., photons on sub-atomic particles, but not (for practical purposes) to photons on a billiard ball. We can consider "Yogic powers" here in two senses, perception and control, both of which, perhaps merge at the point of "micro-event samadhi." Assume that as the yogi makes his mind formless (or taking on the form of the micro-event being concentrated on) in his perception, it becomes more and more "fine" or "subtle"--to the point where it is more subtle than that which is being observed. If such a process is possible, then non-statistical observation of micro-events would be possible in an asymptotic sense, i.e., like the asymptotic "zero-width" element in differential calculus, the chitta of the yogi would asymptote to "zero-grossness." Hence Heisenberg's principle would not be applicable. It is the author's view that if such power's as were described in the text of the paper, that a process such as this must occur, i.e., with perception at such a "fine" level, causality is similarly possible at this level. Recalling the yogic answer to the mind-body problem (Vivekananda's description of the afferent and efferent processes given on page 7), the effect of "mind" which is the true "control center" or executive process (but which is not a physical entity), this system would indicate that we all regularly practice a similar power--that of telekinosis or "mind over matter"--whether we know it or not! By this view, the yogi does not have powers which differ in kind, but only in degree.

Dowling's conclusion (p. 32) that "by practicing the exercise of free will, men can achieve greater and greater control of his environment," then, would be heartily endorsed by the yogi system--except that the latter view would point

control of his mind-self as the more effective way to achieve "external" control--at least for the levels of events considered in the previous paragraph.

(3) Finally, Dowling's conclusion regarding the solution of the mind-body problem that:

I see nothing wrong with admitting mental properties to all matter, but in varying degrees of complexity, so that what results in a sort of unequal panpsychism with the amount of mind present in, e.g., medium sized boulders vs. psychology students, being submitted to a behavioral test (p. 34).

should by now be recognized by the understanding reader as "standard" yoga "dogma." In this regard, the author would like to speculate a bit (!) (in addition to the speculation presented above under the guise of rational deduction) and to make what is perhaps the only original contribution of this entire paper.

C. On "direct" perception. Regarding "direct" perception, which has proved so troublesome for philosophy, both East and West, a new interpretation is offered. First, "awareness" must be defined. Awareness is regarded as synonymous to "consciousness," both terms being considered in the broadest possible sense. Further, that "existence implies awareness" as exemplified below.

Various authors (e.g., Kelley, 1955) have argued that unless the loci of perception of two organisms overlap, they cannot communicate with each other. In more physicalistic terms, unless the "levels of existence" of two entities similarly overlap (i.e., have common dimensions in which they can participate in energy transactions) there can be no causal relationships between them (they cannot effect each other). A concrete example of how "awareness" or "consciousness" is used in the present sense might be a molecule which has mass, such mass being subject to the gravitational attraction of another molecule. In the present usage, the molecules are said to be "aware" of or "conscious"

of or "perceive" each other. Further, we may give this type of perception the term "direct" perception¹³ since it is in the concrete (as opposed to the abstract or conceptual)sense. (cf, the quotation on page 11: . . . "unmixed with name, quality . . ."). This concrete-abstract distinction is felt to be meaningful not only due to the fact that it is the only way in which the author is able to understand (if at all) the yoga literature, but because what we ordinary mortals usually call awareness, consciousness, or perception is what Campbell (1963) calls perception of the "down-stream periscope," i.e., it is abstract perception in that the "directly" perceived (concrete) stimuli are translated (in order to provide greater "meaningfulness" to the organism into the abstract categories or rubrics which have been developed by the higher level organism for the purpose of organizing, assimilating, etc., replications of such "direct" and "concrete" stimuli, i.e., constructing models of distal entity.

Bringing what is usually termed "direct perception," "mystical awareness," or states of "samadhi" into the discussion, it seems consistent that the further away from past memories of physical experiences, abstract constructs, etc., one is able to get, the closer one would be able to approximate "direct" perception as defined above. The author, however, knows no way by which to operationalize such a speculation, therefore, it remains precisely that--a speculation.

¹³It is interesting to speculate, if one is so inclined, that "direct" perception, defined in this manner is also "infallible" knowledge--if it can be called "knowledge" at all.