The International Society for Ecological Psychology

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FOURTH INTERNATIONAL
CONFERENCE ON EVENT
PERCEPTION AND ACTION

TRIESTE, ITALY
AUGUST 24-28, 1987

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1985 ANNUAL MEETING
TRINITY COLLEGE
HARTFORD, CT USA
(Meeting VIII)
October 19, 1985

ABSTRACTS OF
PRESENTATIONS

Phenomenology and
Ecological Psychology

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I suggest that a phenomenological reading of Gibson's Ecological Approach offers a way out of the current impasse between ecological psychologists and their establishment critics. ["Establishment" is used here as a label for various versions of information processing theory].

The inferential theory of perception rests on facts about physical and physiological optics which give rise to the traditional distinction between the proximal stimuli and the distal causes of perception. The establishment's task is accordingly to discover the mechanisms (whether physical or psychological) that explain how an observer gets from detecting properties of ambient light to finding out about features of the environment. But machine models of the mind have been shown (by John Searle, Thomas Nagel, and others) to be logically compatible with the absence of subjective or "qualitative" experience. More generally, one might hold (with Leibniz) that facts about causal mechanisms of perception cannot explain perceptual awareness. Perception involves a particular point of view that can neither be identified with, nor causally connected to, physical states of the perceiver.

Husserl transformed this insight into a methodological principle: Phenomenology begins by "bracketing" or "suspending" beliefs about the world based on scientific theory and returns thereby to pre - theoretical ("direct") experience. Gibson similarly maintained that physical optics and physiology describe facts, but not facts at a level appropriate for the psychology of perception. Whereas the neo - Cartesian establishment carves off the "psychological" from "physical" for the purpose of investigating the inferential mechanisms of perception, the phenomenologist and Gibsonian psychologist study the "behavioral environment" -- that is, the world of ecologically significant properties ("affordances") that intrinsically refer to perceivers' actions and intentions, and are commensurate with their bodily size and capacities. Perceiver and environment are thus reciprocal notions; they neither exist independently of one another nor are they independently definable.

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CHICAGO AREA ISEP MEETING

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"Phenomenological accessibility" seems, moreover, to be the operative (if not explicit) constraint on the notions of "direct pickup" and "directly perceived properties" in Gibson's theory. Since the proximal - distal distinction has no place in ecological optics, the ambient optic array cannot be construed as mediating between the "objective" (external) world and the "subjective" (inner) experiences of the perceiver. Rather the ambient optic array is the visible environment from a point or path of observation. To pick up features of the light and to see features of the environment are not different "states of mind", but two ways of describing the same perceptual event. A distinction must however be drawn between two types of phenomenological accessibility: viz., awareness of optical structures and awareness of features of the environment. Invariants and disturbances in the transforming optic array (like slant or gradients and flows of optical texture) are given in perceptual experience but they are not the ordinary objects of perceptual awareness. To isolate optical invariants requires a change of "focus" or attention -- away from affordances of the environment to the properties of the light which specify them. The "laws" of ecological optics typically relate these two kinds of structure, e.g. "equal amounts of texture, equal amounts of terrain."

The phenomenological accessibility constraint provides a way out of the current impasse in perceptual psychology. The point is to keep separate the distinct levels of description and explanation of perceptual events.

Direct Perception with
Mental Representations

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A sketch ws given of a theory of inner representations -- what they are and what their intentionality consists in. This sketch entails that inner states or entities are not representational on account of their actual causes, actual dispositions or functions. For example, it is not their having certain "functions" of the sort referred to by contemporary "functionalists" that makes them be representations. Rather, it is by reference to the evolutionary history of the biological devices that produce representations, and to the sorts of functions that historically accounted for proliferation of these producing mechanisms, that an inner item or state falls into the category "representation". Representations are marked by the fact that they map, when functioning in their evolutionarily proper way, upon that which they represent. More specifically, given any correct or "true" representation, there are transformations (mathematicians' sense) that may be performed on that representation yielding other representations in the same representational system, and these transformations correspond one - one to transformations that might be performed upon the world affair mapped, yielding other world affairs that would make these other representations true or correct. Thus inner representations are abstract "icons" or "pictures" of a sort. (Details of this position and full defense may be found in Millikan, Language, Thought, and Other Biological Categories, Bradford Books/MIT Press, 1984 and in Millikan "Thoughts without Laws; Cognitive Science with Content", The Philosophical Review, January 1986.)

Given this theory of what inner representations are, it follows that that a certain inner representation is a representation at all and what it represents are neither of them things that could be discovered merely by inspecting the representation itself, by inspecting the system that manufactured and uses the representation, nor by inspecting the contents of the consciousness of the being that harbors the representation. Whether and what a thing represents depends not upon any current affairs but upon the history behind it. Intentionality is not to be found within consciousness; no bare act of awareness is as such an awareness of anything; consciousness is radically nonepistemic. Sense data, phenomenal

objects, merely intentional objects fall away, leaving only things that are not directly before or within consciousness as possible objects of awareness, indeed as entities enjoying any kind of being. The object of awareness is always external to consciousness, always mediated. Hence the claim that perception involves the production of inner representations, involves mediation, does not imply that perception is indirect in any interesting sense. It is not the inner representations that are perceived, of which one is aware, but the outer world, and if this perception is not to be called "direct", then no perception is "direct".

Commentary on papers by
Blinder and Millikan

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David Blinder depicts the relationship between ecological psychology and the information processing approach (the "Establishment" view) as an impasse, an instance of the more general difficulty of reconciling an objective understanding of cognition with subjective or personal experience of the world. Recognition of this and espousal of a phenomenological reading of Gibson, Blinder claims, would clarify the situation and dispel the sense of conflict by showing that the Establishment and ecological psychology are tackling different questions. Blinder's goal in all this is to reconcile the two approaches to psychology.

Any attempt to reconcile the differences between the two approaches and preserve both of them seems misguided to me. In this case, to advocate a phenomenological reading of Gibson ignores the fact that he and other ecological psychologists have continually sought ecological laws that would constitute the foundation for a full psychological account of behavior. Thus ecological psychology does not relinquish the problem of explaining causal mechanisms, and it is description, and that they need to be kept distinct, provides no solution to the fundamental problem of how these levels are related, which is precisely what the ecological approach is trying to provide.

Ruth Millikan argues that mental representations are compatible with direct perception. The relevant conception of representation, on which the argument is founded, is based on two ideas. First, whether or not an inner state or structure is a representation is dependent upon the state or structure's (evolutionary) history. Second, if something is a representation, it will be a member of a system of representations subject to transformations which correspond one to one with transformations of the states of the world represented. As a consequence of this view, one cannot tell if an entity is a representation merely by looking at it. Because intentionality is not local, it is wrong to conceive of perceiving in terms of a representation appearing before the mind, for that would be to locate intentionality back with the bare act of awareness. Rather, mental representations are the mechanism whereby organisms see things in their surroundings. Because nothing comes before the mind, perception is direct, unmediated.

Our basic intuitions about representation are pictorial, diagrammatic, and ultimately also linguistic; representations are structures which we manipulate. Those who have sought a useful notion of inner representation have often chosen some version of the mental sentence view, which factors a mental state into a sentence token, which is manipulated, and the background state, part of which manipulates. Millikan avoids this picture; my concern is whether there is then any point to talking of (inner) representation. Ecological psychology has seen considerable success in explaining an organism's behavior without recourse to the notion of representation. Moreover, Millikan locates the correspondence, not between individual representations and what they represent, but between the transformations of both representations and states of affairs. I doubt, however,

that the language - world relation is generally as simple or "transparent" as this: supposing that the specification of proteins in DNA is a useful model of some aspects of language, one can modify the sequence of bases, sometimes even to the extent of modifying the amino acid chain, without altering the function performed by the enzyme molecule that results.

Finally, these worries and criticisms notwithstanding, I regard these two papers on philosophical issues relevant to ecological psychology as a welcome inclusion in the meeting's program.

Drawing: Perception and Representation

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Though they appeared to be accurate traditional representations of figures drawn from direct observation a careful examination of a number of drawings produced by academic artists of the nineteenth century revealed a common, curious characteristic. Each section of each drawing had been drawn as though seen on a level with the artist's eyes. It was obvious that each drawing was a construction, a composite of separate views, based on observed information, which was then adapted to fit a preconceived model of an ideal representation of each portion of the model's body.

The representational system employed by these draftsmen was not based on the linear perspective canons of the Renaissance, which produced images that appear to be drawn as though the artists observed their subjects monocularly, from a single point of view. It is this form of spatial representation that is found in photographs.

Because the innate limitations of human vision restrict visual clarity to an arc of approximately two degrees, anyone who attempts to study a subject closer than twenty feet moves his eyes to fix on the area of interest. Unlike the camera, the artist who wishes to study a subject carefully, must shift his viewpoint many times. The image that results from this process may appear to be drawn from a single monocular viewpoint, as in drawings based on Renaissance traditions, but, in fact, it too, is a construction.

The late nineteenth century drawings of Degas, Toulouse - Lautrec, Van Gogh and Cézanne exhibit characteristics that result from the sequential observation of portions of their subjects. These representations differ significantly from both Renaissance models and those produced by the artists in the academies.

In the visual arts representational images are often classified as conceptual or perceptual: a conceptual image being a recollected or imagined construction that contains indications of the essential qualities of an object or experience; a perceptual image being an accurate record of the artist's observations produced as he studied his subject. In fact, the distinction between perceptual and conceptual representation is insignificant, for every representation is a construction.

Previous perceptions provide the stored information from which conceptual drawings are conceived and rendered. Conceptions, previously developed, impose their limits on perceptual drawings. What is represented is not what is there, but what is there that satisfies the expectation of the observer. When an artist draws directly from a subject the ensuing event is a confluence of the observed and the observer.

The artist draws what he perceives, but he also draws how he perceives. Artists who intend to accurately represent what they perceive encode their perceptions in a system of drawing that records and communicates the information to which they attend. The accuracy of their representation is determined by the degree to which the information recorded is consistent with information available to other observers of the same subject,

and the degree to which their image conforms to the rules that govern the system of representation they employ. [Nathan Knobler will send copies of drawings that illustrate his point to anyone who requests them from him -- Ed.]

Where's the Camera?

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(Presented by M. A. Hagen)

Studies in pictorial perception have demonstrated how pictures may be viewed at extreme angles without distortion of the represented scene. Unlike the real world where the visual field begins at the face, in the picture world foreground information is truncated, causing compressed distance perception. Also suggested by recent work is that the images of objects can be manipulated mentally much like the objects themselves can be manipulated physically.

The present study in pictorial perception asked the question whether an observer can accurately determine where the camera was when a picture was taken. More explicitly, do slides provide enough information for the real world scenes they depict for observers to make accurate estimates of angle, height, and distance of camera from focus point.

Stimuli consisted of 40 slides taken at two different heights; 20 at five feet and 20 at eight feet. Slides were taken at 20 different points in a classroom with the camera placed against each of the four walls. For each slide, the camera was focused upon a common point in the middle of the room, creating five angles of projection upon that point. The room used for slide ranking was also used for presentation. Observers were 33 undergraduate psychology students divided into two groups. Observers in each group were shown the slides in random order while indicating on a scaled map of the room estimated camera positions.

Observers in the first group were asked to leave their answer maps in a stationary position for the duration of the slide presentation. Observers in the second group were allowed to rotate their maps at any time.

Results revealed that observers were quite good at estimating angle, and that those allowed to rotate their maps were about twice as accurate as those not allowed to move their maps. Observers in the free map group deviated by an average of 12.8 degrees (out of a possible 180 degrees) from the true camera positions; observers in the fixed map group by an average of 26.7 degrees. For estimates of height, observers in both groups underestimated the eight feet heights by an average of 2.3 feet (a 28% error), and under or overestimated the five feet heights by an average of 1.2 feet (a 24% error). For distance, observers in each group made estimates that reduced the actual distance between camera and focus point by approximately 60%. The hypothesis that both groups would make equally accurate estimates of angle was not supported; observers who were allowed to rotate their answer maps were 48% more accurate. However, both groups' judgments of angle were still quite good. It is suggested that those who could not rotate their maps rotated the visual field (the scene depicted in each slide) mentally when making their judgments. The hypothesis that observers would make accurate height estimates (judging the five and eight feet heights with equal accuracy) received good support. However, it is not apparent how the use of answer maps affected observers' estimates.

To interpret our findings better, future research will be directed toward replicating the present experiment with a transparent response measure. In this condition observers will be asked to stand at the position at which they believe the camera was when the picture was taken. The experimenter will then chart the observer's position on a scaled graph of the room. Findings can then be compared with the present study to better understand the conditions.

Any suggestions for the research will be well appreciated. Please contact Bob Giorgi, 74 Ashford St., Boston, MA 02134.

Pictures and the tangible

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CANADA

Lines in outline drawings stand for edges, boundaries of rounded objects, cracks and wires, i.e. change of layout. These features are tangible. They form part of the normal everyday environment for the blind. The directions of features of the environment are governed by perspective for touch just as much as for vision. Ergo haptic pictures for the blind logically make sense. They are not a contradiction in terms. And, empirically, it is found that the blind can recognize outline pictures of rounded and flat - surfaced objects, and can successfully use some aspect of a perspective geometry, notably "vantage points" producing top "views", side "views" and even three-quarter "views".

Pictures as Representations: Commentary on the papers of Knobler, Giorgi & Hagen, and Kennedy

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What sort of information does a perspective picture display that enables it to function as an efficient mode of representation? According to classical geometrical optics, a pictorial display must replicate the same set of rays in a visual angle to an observer as did the scene represented. According to physiological optics, a picture must replicate the retinal image obtained in the depicted scene. Neither of these theories can be correct for, as Nathan Knobler so well illustrated, a single a single picture can be the product of multiple points of view, the product of a mobile gaze, and yet still qualify as a good representation. Moreover, as Giorgi & Hagen's study underscored, a perspective picture is perhaps a better representation of the scene than of the artist's (or camera's) point of view. A picture provides information that allows an observer to have generative knowledge about the scene depicted without necessarily having exact information about the station point (although some information about the station point seems to be displayed). Finally, John Kennedy's studies of pictorial production and perception in the blind shows that perspective information is abstract enough to be conveyed haptically as well as optically, and that the blind as well as sighted people are inclined to distinguish a dimension of realism - convention in pictures.

Taken together, these studies suggest that a more radical account must be given of how pictures represent than has yet been attempted. I propose that we start by modigying Gombrich's "eyewitness principle" (from his Art and Illusion, [1961] and his The Image and the Eye [1982]). This states that a realistic picture must not display anything that an observer could not have seen from the station point. Gombrich bases this principle on Gibson's theory of occlusion, arguing that the ecological optics of occlusion provides a better basis for realism in representation than perspective. But Gombrich falsely assumes a stationary observer, one who is scanning a particular field of view, but who is not sampling the entire optic array by head movement or locomotion. But the world that we represent is normally seen through ambient and ambulatory vision, not through peephole viewing, so the eyewitness principle must be modified.

Perhaps the following is a bit closer to the truth: a picture is representative insofar as it provides some information for how the original scene was viewed and insofar as it does not provide information for anything that could not have been seen by the original viewer. This means that a

realistic picture will be a source of generative information about a scene, and will include at least some information about the limits of what can be known via the display. Such a modified eyewitness principle is consistent with the results of Knobler's, Giorgi & Hagen's, and Kennedy's studies, but can it be tested further, and how far can it be generalized?

ABSTRACTS FROM POSTERS

Direct and Indirect Pictorial Advertisements: Preference and Memory Effects

John M. Kennedy, Gino R. Sette & Roberta Whitby
U. of Toronto

Two kinds of widespread advertising displays are considered. "Direct" advertisements state their message plainly, showing the product obviously. "Indirect" advertisements show or allude to products in an obscure manner. In brief exposures, subjects prefer "direct" advertisements. In longer and adlib exposures, subjects prefer "indirect" advertisements. In a recall task, the indirectly - promoted products were more frequently recalled.

Shape and Contour: the points of maximum change are least useful for recognition

John M. Kennedy and Ramona Domander
U. of Toronto

Attneave (1954) hypothesized that recognition of a shape would be best if the eye was given those parts of the shape most different from a straight line, i.e., regions of maximum direction change (MAX points). We find MIN points - the points midway between MAX points - are actually better for shape recognition. But we also find that by far the best parts of the shape for recognition are the regions intermediate between MAX points and MIN points. We suggest these regions are especially suitable for shape extrapolation and interpolation because they are evenly distributed.

BOOK REVIEW

From Ed Reed

V. Bruce & P. Green (1985). Visual Perception: Physiology, Psychology & Ecology. Hillsdale, NJ: Lawrence Erlbaum Associates.

This is a highly successful introductory textbook on visual perception. Through a mixture of clear exposition, careful choice of illustrations, and good organization, the authors accomplish a great deal in a short compass. In fourteen chapters a student will be exposed to the essentials of three important contemporary approaches to vision: the sensory psychophysiology of "coding" (feature detectors, spatial frequency channels, etc.), computational analysis of complex images (the Marr - MIT model), and ecological optics, as developed by J. J. Gibson and his students. The book is well researched and the choice of examples illustrating each view is appropriate and helpful. The wide range of examples is a real plus, and makes the book practically unique: students will read about everything from bar gratings to perceived causality, from zero - crossing analysis to time - to - contact, from structure from motion to the perception of faces. The book is, of course, wide but not deep; however, I actually think that is a good thing. Readers are not distracted from the subject of seeing by the usual endless litany of information processing stages and studies which are, at best, of tangential interest to students of memory and cognition, but irrelevant to seeing. With proper supplementation from review articles and primary sources for each of the approaches represented, this volume provides an excellent backbone for a solid, up to date, undergraduate course on vision.

Bruce and Green, however, have attempted to write more than a textbook. Their book is also an essay in relating the three approaches to vision. Here they

are markedly unsuccessful. They assume that it is legitimate to set the approaches off against each other as if they were at "different levels" of analysis: physiological, psychological, and ecological. This simply won't work. The Fourier folks would like to explain all of vision as much as the Gibson types. And much of David Marr's claim to fame comes from his physiological modelling as well as his computational modelling (both are represented here). Similarly, Gibson devoted about half of his The Senses Considered as Perceptual Systems (SCAPS, 1966) to developing a systems physiology for perception. Honest clashes in science are important and should not be avoided for the sake of apparent compromise. The issues of controversy among these approaches are mentioned here, but from the point of view that setting explanations at "the right level" will solve disputes among the different points of view. Bruce and Green do not seem to understand that the different kinds of explanation sought by the three approaches are at odds with each other at all levels.

One of the ways in which Bruce and Green bypass important disagreements is manifested in their treating David Marr's as a "psychological" level theory of vision. To my mind this characterization completely misses the mark, and is highly objectionable. Marr's is a computational account of seeing and, if one assumes that all psychological processes are computational, then this makes sense. But there is simply no evidence that the processes postulated by Marr have any psychological reality whatsoever. What Marr has done is to redescribe Helmholtzian processes of inference from sensation to perception and the Gestalt laws of field organization of proximal stimuli computationally. Now, this redescription actually robs these processes of whatever psychological reality they might have had claim to. Both Helmholtz and the Gestalters had accounts of why certain processes were learned or innate, why some were accessible to consciousness and others not, and the Gestalters especially had accounts of how psychological factors in general ("ego organization") affected perception. Marr has none of this. In fact, there are only occasional and ad hoc explanations of such truly psychological issues throughout AI literature. It is certainly significant that there is no discussion of perceptual learning at all in Visual Perception and that social aspects of seeing are placed under the "ecological" not the "psychological" approach.

Given their ill - conceived categorization of psychological processes it is thus most unfortunate that Bruce and Green see fit in their conclusion to attack Gibson for not having specified the psychological processes involved in vision. This is simply a massive misinterpretation, based on Bruce and Green's artificial levels of explanation, which they have allowed to obscure the real differences in kinds of explanation sought by visual perceptionists. Throughout Gibson's last two books, and throughout the last thirty years of Eleanor Gibson's work, there has been extensive emphasis on the relation of perception to memory, expectancy, motivation, cognition, and learning; there is discussion of strategies of looking; there is great concern for the modification of direct perception by language and pictures; and there is the first real attempt to develop a social psychology of perception (as versus attribution). To label Marr's computational descriptions of hypothetical events as psychological processes and Gibson's of functional psychological events as non - psychological may be in vogue, but it lacks all sense. Bruce and Green end their book by repeating the tired claim that Gibson cannot explain the cognitive level of vision, "seeing - as" as opposed to just seeing. But this is precisely the opposite of the situation. Gibson is the only visual perceptionist who has even attempted to carefully distinguish specification of objects (direct perception) from depiction, ostension, and predication (indirect perception and cognition). It is Gibson's theory that has room for both seeing - as and seeing, whereas other theories must necessarily reduce the latter to the

former (or, occasionally, vice versa).

Bruce and Green also perpetuate the myth that Gibson had no physiological account of perceiving. Yet they fail to mention the fundamental distinction on which his entire theory of perceptual systems is based: the claim that obtained stimulation is radically different from imposed stimulation in its psychological consequences. This distinction radically changes what counts as either a physiological or psychological explanation of vision (again, the problem is to distinguish different kinds of explanations). The kind of input analysis described in Section I of Visual Perception is simply irrelevant to visual perception, Gibson argued in SCAPS (although such processes may be relevant to visual sensation). Moreover Gibson abandoned the centuries - old tradition that a theory of perception must postulate mental mechanisms for expanding sensations into perceptions ("input processing"). Instead, he argued, actively obtained stimulation (for which sensations are irrelevant and occasionally non - existent) supports perception. A theory of perception on this view is an account of the functional neural and psychological process of detecting external structure in the energy fields of the environment. The physiological and psychological processes are described at length in SCAPS, a book which has been sadly misread by Gibson's opponents and proponents alike.

Visual Perception thus meets the real need for a good concise introduction to visual perception (as opposed to visual sensation or information processing) for undergraduates. Its use at a higher level is more problematic, as the authors' attempt to reconcile irreconcilable differences of viewpoint leads to a number of serious misinterpretations and confusions. However, given the clarity of Bruce and Green's exposition of individual positions (as opposed to their botched attempts at synthesis) it might form a good basis for discussion, as long as students are also exposed to Gibson's SCAPS, Marr's Vision, Koffka's Principles, and, of course, Helmholtz, so that they can learn for themselves the impossibility of compromising radically opposed scientific theories.

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[For other comments stimulated by the same book, see Nature, 315, 258 (1985) and 317,22 (1985) -- Ed.]

First Big Snowfall of the Season Takes Albert Cranfield by Surprise

"The topic for today is: What is reality?"

THE NEW YORKER FILE

We found the following ecological tidbits in our tattered folder of clippings from The New Yorker.

The Moonshine Illusion. Writing about a colorful and talented liquor control officer (Garland Bunting) in Halifax County, North Carolina, Alec Wilkinson described a nice example of an intrinsic measure of alcoholic purity -- and how to fake it. "There is a simple test to verify the approximate proof of any pure distillate: shake it. The bubbles that form are the bead. In liquor of a hundred proof, the bead sits exactly halfway in the liquor, half out [i.e. in the air above the liquid -- ED.]. It sits higher if the liquor is less potent, and lower if it's more [i.e. the surface tension of alcohol pulls the bubble down less than the surface tension of water; the more alcohol, the less surface tension, the higher into the air the bubble -- ED.]. White liquor is customarily a hundred proof. Bootleggers, however, know about something called beading oil, which has its proper use in the textile industry and is not meant to be drunk. Added to a quantity of sixty - proof or seventy - proof liquor, a few drops of beading oil will sit the bead properly." August 19, 1985, 43.

Design Decisions. If you're ever in San Antonio or El Paso Texas you can stay at something called a Hometel. Even though the owners wanted managers to be highly visible and mix with guests as they moved in and out, the managers preferred to stay in their offices. "So we played a little trick on them: we took their desks and moved them out into the lobby. And that's where our managers are."

"And when we first started looking at shower doors, which are usually opaque, we knew that the maids wouldn't clean them. So we put in clear - glass sliding doors. The maids have to clean them. There's just nothing else that they can do." -- Stephen B. Oveson of Hometels Management Company, Inc.. Quoted from "Talk of the Town", August 9, 1982, 23 - 24.

Ecological Dr. Johnson. "When a Mrs. Langton 'shewed him [Dr. Johnson] her Grotto, & asked if he did not think it a pretty convenient habitation? -- Yes, Madam replied he -- for a Toad.'" From Dr. Johnson By Mrs. Thrale. Reviewed December 30, 1985, 80.

If you follow the threads. . . . "The part of my sensibility which I demonstrate in nonfiction makes fiction an impossible mode for me. That's because for me the world is already filled to bursting with interconnections, interrelationships, consequences, and consequences of consequences. The world is overdetermined: the web of all those interrelationships is dense to the point of saturation. That's what my reporting becomes about: taking any single knot and worrying out the threads, tracing out the interconnections, following the mesh through into the wider, outlying mesh, establishing the proper analogies, ferreting out the false strands. If I were somehow to be forced to write a fiction about, say, a make - believe Caribbean island, I wouldn't know where to put it, because the Caribbean as it is is already full -- there's no room in it for any fictional islands. Dropping one in there would provoke a tidal wave, and all other places would be swept away. I wouldn't be able to invent a fictional New York housewife, because the city as it is is already overcrowded -- there are no apartments available, there is no more room in the phone book. (If, by contrast, I were reporting on the life of an actual housewife, all the threads that make up her place in the city would become my subject, and I'd have no end of inspiration, no lack of room. Indeed, room -- her specific space, the way the world makes room for her -- would be my theme.)" From "Talk of the Town", August 26, 1985, 19 - 20.

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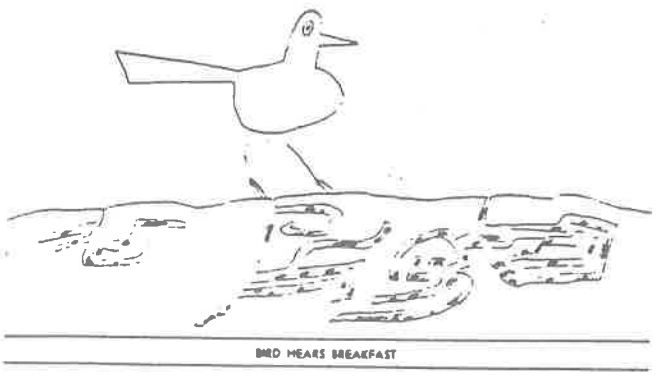
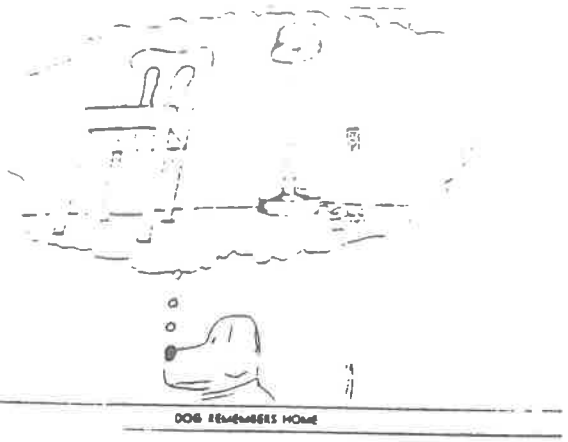
BILL WARREN'S REVISED STEINBERG

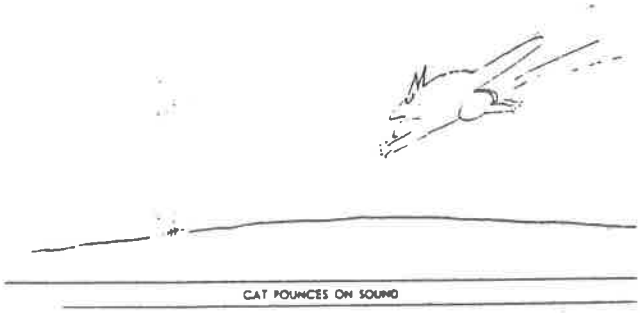
ECOFUNNIES



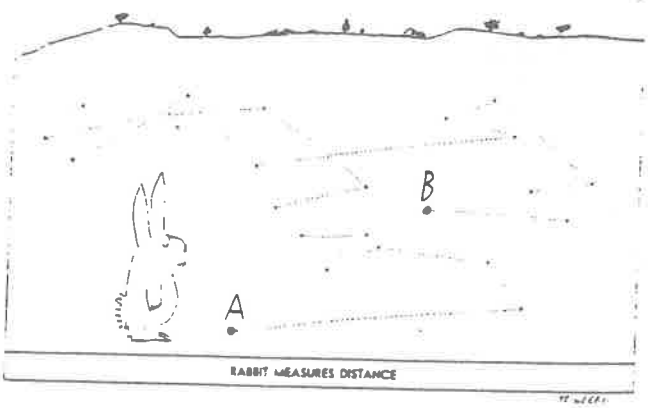
A Case Study in Gastrological Acoustics



The Perception/Cognition Interface
(or Eyeheight Information, Revisited)



With Applications to Missile Guidance Systems



Ecometrics

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c/o DEPARTMENT
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