

JAMES J. GIBSON MEMORIAL LECTURE

This year's James J. Gibson Memorial Lecture will be given on Friday, October 31 (Halloween!) by David N. Lee of the University of Edinburgh. The time will probably be at 4 p.m. (16:00 on the 24 hour clock). The lectures are given every fall at Cornell University in Ithaca, New York 14853 - 7601. For more information, write to the Department of Psychology, Uris Hall at Cornell.

MEETINGS

ISEP ANNUAL MEETING  
October 18

The Philadelphia meeting is shaping up. If you can present a POSTER, please contact Claudia Carello by mail or by phone (Dept. of Psychology, Trinity College, Hartford, CT 06106, (203) 527 - 3151, Ext. 408).

ISEP SPRING MEETING

As stated in the last Newsletter, we will be meeting in Atlanta in the spring (May). Watch the Newsletter and other ISEP mail for details as they materialize.

TRIESTE

You should soon be receiving mail about the Fourth International Conference on Event Perception and Action from Walter Gerbino. He expected to send out a preliminary list of symposia, a call for papers and posters, and registration information early this month. As you will see in that mailing, the relevant addresses have changed for this year while Walter is visiting in The Netherlands. Inquiries about the program and its details should be sent to:

Walter Gerbino  
NIAS  
1 Meijboomlaan, 2242 PR  
Wassenaar  
The Netherlands  
Phone: 01751 19302

The on - site work in Trieste (Housing, registrations, etc.) is being handled by Elisa Malutta. Write:

Elisa Malutta  
Trieste Traduzioni Congressi  
Viale XX Settembre, 4  
34125 TRIESTE, (Italy)  
Phone: 040. 765355/767155

ABSTRACTS OF PRESENTATIONS  
AT LAKE FOREST  
May 23 - 24, 1986

On How to Run Experiments  
on Surface Slant

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Gibson's (1950) original psychophysical conjecture on "slant perception" had it that phenomenal slant of a surface would correspond to the rate of increase of the density of texture elements. Despite its recent ex post facto corroboration by means of an improved methodology which takes into account the perceived slant of the window within the frame of which a pattern is displayed (Perrone, 1980) the hypothesis can be challenged for two reasons: For most natural surfaces it is not adequate to model them by static pictorial patterns because there is a layout texture to them which makes for multiple attached shading and occlusion at a micro level. Thus defining texture elements and computing gradient functions is not so straightforward technically as it first appeared.

Based on an overview of the ecology of slanted surfaces the affordances of slant in the ground surface (e.g. hill climbing) were considered and three strategies for research were proposed: (1) behavior observation outdoors, (2) media simulation, and (3) computer simulation. As for the latter, subjects will still do "palm board pointings" but these will modify the stimulus information provided on the screen, i.e. subjects may be asked to judge when slanted surfaces become or cease to be climbable. Liberalizing the task from the constraint of identifying the extrema of slant - as - a - barrier and optimal slant for minimum energy expenditure brings up the problem of "intentionally" choosing possible paths of locomotion. I cannot use this method with computer simulations because the pictorial surfaces I can create lack the necessary wrinkled qualities described in my initial criticism of the psychophysical experiments.

The Reciprocity of Perceiver and Environment: An Introduction to the Evolution of James J. Gibson's Ecological Psychology

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Einstein once said, "The most incomprehensible thing about the universe is that it is comprehensible." In studying the history of perceptual theory, I have come to the conclusion that traditional science and philosophy (dualistic and elementaristic theories) have not provided a satisfactory explanation of how we can have knowledge about the natural world. James Gibson was also dissatisfied with traditional accounts of perceptual knowledge. It is a mystery why the world is comprehensible. Gibson's ideas on perception reveal a significant break with tradition. His ecological psychology and direct realist epistemology is founded upon the principle of reciprocity, which, I believe, provides a fundamental alternative to dualistic and elementaristic theories of perception. By way of introduction to my forthcoming book

on Gibson's development and the history of perceptual theory, I will outline some of the basic themes of my study.

From the ancient Greeks, we get the idea that objects send off copies (eidola) of themselves which travel to the perceiver and are viewed within the mind or brain (homunculus). Eidola simulate the world, as well as providing a causal link (physical contact) between the perceiver and the world. Simulation and the homunculus are dualistic ideas.

Medieval thought, through Alhazen, laid the foundations of optical and psychological elementarism, where perception was thought to involve a building - block process involving memory and inference.

The empiricist philosopher Berkeley accepted the ideas of simulation and psychological elementarism, adding the concepts of signs and association to the building - block explanation. Nineteenth century empiricist philosophy and physiology accepted Berkeley's explanation of perception, further extending his views with the specific energies of nerves hypothesis and the traditional sensation - perception distinction.

Rationalist, nativist, and Gestalt theories of perception carried on the constructivist approach to perception, though order and organization were seen as imposed upon sensory input from nonlearned sources. Both wholism and elementarism resulted in indirect theories of perception. Modern philosophy and epistemology, for similar reasons, also ended up with indirect theories of perception.

Gibson beginning from his adaptation studies and Air Force experiences, as well as drawing inspiration from Troland's psychophysiology, developed in the 1950's a psychophysics of perception. Gibson rejected stimulus elementarism, instead proposing that higher order relationships (spatial and temporal) were stimuli for perception. Further he rejected the

"objects in space" conception of depth, instead proposing that the ground provided a spatial framework for the perception of continuous distance, location, and movement.

During the 1950's Gibson further developed his psychophysics, in particular substituting the optic array for the retinal image as the visual stimulus. By the late 1950's, Gibson moved away from a perceptual psychophysics, developing such key concepts as stimulus information, perceptual activity, invariants and transformations, and a new theory of perceptual learning. Proposing a functional psychology, reminiscent of John Dewey, Gibson rejected the linear causal model of perception, instead arguing that effective stimulation was contingent upon perceptual activity.

By the 1960's Gibson's approach was clearly at odds with Descartes' mind - body dualism and the mind - matter dualism of the Scientific Revolution. My historical hypothesis is that mind - matter dualism can be traced back to Plato. Interestingly, Aristotle's philosophical alternative to Plato turns out to be similar in many respects to Gibson's ecological psychology. Other important historical anticipations or contributions to Gibson's ecological approach include Leibniz's critique of absolute space and absolute time, Darwin's evolutionary theory, Brentano's act psychology, Heider's ecological psychology, and modern systems theory.

During the 1960's Gibson developed a variety of new concepts that would be significant within his ecological approach. They included perceptual systems, affordances, occlusion, ecological optics, and event perception.

My central theoretical hypothesis is that the principle of reciprocity, in opposition to dualism and derivative views, is the most fundamental idea in Gibson's mature (1970's) ecological approach. Animal and environment, perception and proprioception, objective

and subjective, persistence and change, and a host of other concepts in Gibson's approach are understood as reciprocities.

#### Acquisition of Coordination

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There has been little systematic study of the acquisition of coordination. One reason for this is that most of the tasks utilized for the study of skill learning have minimized the problem of coordinating biomechanical degrees of freedom. Traditionally, motor tasks either employ a single degree of freedom response such as a key press or require a single limb arm movement where the task constraints allow the subject to produce an already established pattern of relative motion. Thus, not only has the skill learning domain failed in large part to study optimal performance or skill, but has also failed to examine the very early components of skill learning which revolve around requiring the form or structure of movement control. The talk focused on these particular issues and their implication for the current status of skill learning.

One line of research that exists on the acquisition of coordination is in motor development where infants show systematic trends in acquiring the so - called phylogenetic activities. Gesell has claimed that directional trends of cephalo - caudal and proximal - distal exist in terms of the order with which the topological characteristics in response dynamics emerge during ontogenetic development. The generality of this claim for the acquisition of coordination in ontogenetic skills was examined along with the various hypotheses that have been advanced to account for these directional trends in response dynamics. It may well be that these developmental principles reflect general principles for the acquisition of coordination. However, the coordinative structure theory would imply

that this order is a consequence of the specific constraints imposed on the actor.

#### Vision, Posture and the Developmentally Disabled

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School of Physical Education  
University of Minnesota 55455

Mentally handicapped and normal children and young adults were compared in their ability to maintain an upright posture when the optical flow field was used as a perturbation. Subjects were measured standing upright on a force platform while a disk rotated at 45 degrees of arc per second. Deviations from the upright posture were measured in both the anterior / posterior plane and the medial / lateral plane.

Several dependent variables were used to analyze the relative effects on both groups of subjects. The data were mixed in terms of their results. An initial pilot study indicated an increased sensitivity to this kind of optical flow field by the normal individuals, suggesting a much higher level of perceptual sensitivity. The second group of subjects studied showed just the opposite, with the handicapped individuals showing much larger deviations about the center of pressure. Further work will continue to determine just exactly what the impact and meaning of the different dependent variables generated have on dealing with this problem and also the relative effects of peripheral versus foveal vision as it relates to these kinds of optical flow - field perturbations.

#### NEWS & WEATHER

Jean - Paul Londres

From around the corner and around the world, ecological topics make news. However, even the scrupulous news hound may have difficulty identifying the good news, the bad news, and the ecologically valid news. To assist you in the quest,

our crack team of reporters and stringers brings you News & Weather of ecological psychology. The particular orientation of topics, the slant of the stories (or, is it tilt?), varies from one installment to the next, but the general perspective is the familiar one.

WORST NEW FLAVOR OF COKE -- By now, the word must have spread around the world that the Coca - Cola corporation, based in Atlanta, Georgia, failed in its recent megalomaniacal attempt at ecological engineering. Specifically, the people at Coca - Cola had been baffled by their own research. Blind sip tests comparing their beverage (the most popular in the U. S.) with Pepsi (second in popularity) found Pepsi the winner. What was Coca - Cola to do? Well, they decided to make Coke taste exactly like Pepsi, so the taste would show no disadvantage for Coke; and, they also decided to introduce new flavors, thereby diversifying their flanking line of offerings and increasing their potential overall advantage against other beverage producers.

Alas, the story has a sad ending. Coca - Cola had pinned its hopes to the Pepsi - clone with which they replaced Old Coke, calling it New Coke. In fact, New Coke turned out to be undesirable by those people loyal to Old Coke -- except in Detroit, of all places. Old Coke, which had been discontinued, was quickly reintroduced (with a slightly altered recipe) to avert a revolt by the consumers. Cherry Coke, and Caffeine - free Coke were the most popular small scale new introductions, and several other short lived varieties were introduced and then withdrawn when they proved to be unpopular: Chocolate Coke, Lemon Coke, Coke de Menthe, Coke Mousse (with longer lasting suds), Breakfast Coke, (vitamin C, extra caffeine) and Coke with a Small Lizard. The last flavor was clearly the worst, and resulted in a lawsuit in Dadeville, Alabama, by a woman who claimed that finding the lizard in her bottle of Coke upset her, and caused her to develop psoriasis. The court awarded her \$500 last March 29th. You can look it up if you don't believe me.

Why did the citizens of the republic reject the new improved formulation of the classic tonic? After all, no one complained when Chevrolet improved (that is, discontinued) the classic Impala, when Proctor & Gamble perfected Crest, or when Hostess altered the Twinkie. The key to this, it seems, is to understand the perceptual differentiation of progress and tradition. Objects of tradition possess fixed attributes; objects of progress are comprised of attributes that undergo development. Coke evidently is one of our cultural anchors, prohibited from changing, and the Coca - Cola company has ironically become the custodian of our heritage rather than the producer of a beverage. Coca - Cola may as well be guarding the Unknown Soldier.

Or something like that . . . but it's a long, long story. Why not sit back, relax, ponder it . . . and drink a NuGrape.

ADVANCED STUDIES in POTATO LOCOMOTION -- Although the New England Journal of Medicine does not exactly specialize in research on locomotion, one recent issue featured a study of a couch potato. A couch potato is a kind of tuber with a very specific ecology. It is usually found in front of a television, gazing for hours at the flickering screen. Its pattern of locomotion is easily recognizable, though it helps to observe such movement with the aid of time - lapse photography, for couch potatoes often appear completely immobile. NEJM reports a case history in locomotion of one individual in particular, who "awoke at noon (on January 1, 1986) lay down on his sofa, watched three consecutive football games . . . and then went back to bed. For a period of more than 40 hours, he did not leave his home, and he stirred only occasionally for refreshments." Left - side chest pains reported by this typical couch potato on January 2 led to the discovery of a pulmonary embolism, a dangerous predicament even for you or me. The doctors blamed the subject's locomotory mode for his condition.

I know, I know -- you have a lot of questions about ecological variables that the medical doctors simply ignore: Was viewing monocular or binocular? Was a bite - board used to guarantee immobility of the subject's head? Did he stay up late on New Year's Eve? Did he ever change out of his pajamas? Was he deeply upset about the drug and sex related shenanigans of professional athletes? We can only speculate, given the casual emphasis placed on such matters in medical reports.

It is too late for this poor soul to be helped easily, but maybe the rest of us can benefit from this sobering tale of tuberous locomotion. The public policy implications of this study seem clear, especially in respect to revising the rules governing the serial broadcast of athletic competitions. First, the number of commercial interruptions should be increased, and their duration should be lengthened to match the average foraging trip between the tv room and the kitchen. Human factors research is warranted in this area. Second, half time entertainment should be made excruciating, insufferable, unwatchable, and even more pointless, in order to evoke the couch potato's nociceptive reflexes, and the accompanying benefits of physical activity. Note that this may still be effective even if the viewer has lapsed into a functionally decerebrate state (assuming no other CNS pathology).

Next, the frequency of advertisements for inedible commodities (outboard motors, shaving cream, computers, steel belted radials, Vitalis . . .) should be reduced in favor of messages about products that inspire the couch potato to move (snacks). The scheduling of ads might even be adjusted to the optimal pattern for eliciting locomotion, to minimize the risk of clotting. Last, cigarette advertising should be brought back to television. When the viewer sees depictions of satisfied smokers on the tube, a frantic search for unsmoked butts is sure to follow.

Consider the health benefits of this last proposal. It promotes a lunatic level of vigorous physical activity -- after all, have you ever seen a smoker ransack a house calmly? -- that may equal the cardio pulmonary effects of jogging for twenty minutes. As the cliché goes, further research is required to gain insight on this important problem.

ANNALS OF ARTIFICIAL INTELLIGENCE -- In the U. S., the family Bible has been replaced by the video evangelist. Now, at any time, night or day, if you feel the need to remind yourself about redemption, you can flip on the box and watch the good news of your choice. You are wondering, naturally, how a religious organization can possibly afford to televise itself without a huge cash supply. Well, the way the plate is passed in videoland is by soliciting dial - up pledges. In other words, you may contribute to the good video work by calling a toll - free number and signing up . . . which is where our story begins.

One video evangelist also is the leader of a political organization called the Moral Majority, which raises its funds in this way and seeks to promote the values of good family, good home, good community, good church, good nation. People of the immoral minority tend to be displeased by such intolerance and lack of ambition, and one such person was angered enough by this TV preacher to take reckless action. He programmed his home computer to dial the evangelist's toll - free number, to stay on the line for a few seconds, then to hang up and redial. The whole sequence took about thirty seconds, and the program was used continuously for eight months! Talk about dedicated systems! The objective was to jam incoming sincere calls with the computer's mischief calls, and so to interfere with the financial support for the organization.

Eventually, the Moral Majority figured out what was going on, and enlisted the researchers from Southern Bell, the phone company, to find the culprit. Rumor has it that the programmer at first claimed to know nothing about the computer's harassing phone use, nor about the origin of the few lines of LISP code that proximally perpetrated the deeds. He attributed the program to the computer's creativity and its longing for salvation now that it was capable of artificial intelligence, and, by implication, capable of eating the fruit of the Tree of Knowledge. Then why did the computer hang up without voicing a pledge? No speech synthesizer or D/A capability, though it kept redialing anyway, unable to resist the impulse to seek the true way.

The phone company didn't buy it. They know that AI is a con, and refused to honor the line of mullarkey to which they themselves contribute. Facing a threat of court action, the programmer changed his explanation, now describing the dial - up program as a miracle, yet another glimpse of the divine in human events. We may suppose that this tactic proved unsuccessful, too, for the computer's plug was pulled after all, once the phone company said that it planned to remove the programmer's phone.

The story has two morals, landmarks in the ecology of technology. (1) Legally, the computer does not possess an immortal soul. (2) Theologically, God is in hardware, not software.

MISPERCEPTION OF THE MONTH -- Society member P. E. R. reports seeing someone guess another's age and weight incorrectly!! He immediately admonished the bad guesser to reeducate his attention.

(Don't forget to send your observations of misperception to ISEP News & Weather, c/o Dr. W. M. Mace at the usual address.)

## The Ethico - Moral Log Reports

Many ISEP members have already seen Joe Jackson's general report, "Prolegomena to A Natural Morals." If not, we will be happy to furnish it. But only a few ISEP members who were asked to review the subsequent technical report, "Psychophysical Measurement of Value," have seen it. This technical report has only now been completed. Using regression analysis, this goes into great detail about how the logs were developed step by step, and closes with the full technical analysis of a typical log completed by an individual. The report touches as well on the character of regression error or bias, the dropping of reference points, the avoidance of dependence between the data, and the character of cross - cultural nonverbal communications. Tell Bill Mace if you want a copy of this report for yourself or perhaps for some other member of your department who might be interested. Bill will also be glad to give you copies of the ethico - moral log itself for people to fill out. We would like to get a wide spread in the ages of the loggers, perhaps in particular through extension courses. We want log information from as diverse a sample as possible.

## MEMBER PUBLICATIONS

The purpose of this feature, as explained last time, is to inform Society members about who is doing what. It is not meant to be promotional and it certainly is not meant to be exhaustive. It is meant to show the range of disciplines and subjects included in the Society.

AARON BEN-ZEEV (Dept. of Philosophy, U. of Haifa, Haifa 31999, Israel)

Ben-Zeev, Aaron (1986). Reid's direct approach to perception. Studies in the History and Philosophy of Science, 17, 99 - 114.

MORTON A. HELLER (Winston-Salem State University, Winston - Salem, NC 27110)

Heller, M. A. (1986). Central and peripheral influences on tactual reading. Perception & Psychophysics, 39, 197 - 204.

Heller, M. A. (1985). Tactual perception of embossed Morse code and braille: the alliance of vision and touch. Perception, 14, 563 - 570.

KATHERINE A. LOVELAND (University of Texas Mental Sciences Institute, Houston, TX 77030)

Loveland, K. A. (1986). Discovering the affordances of a reflecting surface. Developmental Review, 6, 1 - 24.

TOM STOFFREGEN (Computer Tech. Associates, Lanham, MD 20706)

Stoffregen, T. A. (1986). The role of optical velocity in the control of stance. Perception & Psychophysics, in press.

CHARLES C. TORREY (Macalester College, St. Paul MN 55105)

Torrey, C. F. (1985). Visual flow and direction of locomotion. (technical comment), Science, 227, 1064.

Torrey, C. F. (1986). Occluding edge displays and random - dot stereograms on the Apple II. (program abstract), Behavior Research Methods, Instruments, & Computers, 18, 321 - 322.

JAAN VALSINER (U. of North Carolina -- Chapel Hill 27514)

Valsiner, J. (1986). Naturalistic research and ecological thinking in the study of child development. Developmental Review, 6, 203 - 223.

## LETTERS

The following is an open letter from Bob Shaw to Bill Warren and Ed Reed. It is the third part of a three part paper

written by Shaw as a reply to Warren and Reed and distributed to those attending the ISEP meeting in Binghamton, New York on October 27, 1984. A short version of the Warren and Reed paper was printed in Vol. 2, No. 1 (May, 1985) of this Newsletter. As stated in that issue of the Newsletter, a full length version of the Warren and Reed paper can be obtained from Bill Warren (Dept. of Psychology, Brown University, Providence, RI 02912) and the complete Shaw paper can be obtained from Bob Shaw (Dept. of Psychology, University of Connecticut, Storrs, CT 06268).

Dear Bill and Ed,

I read with great interest but considerable ambivalence your concerned comments about the role we ecological scientists might play in helping guard our ecosystem against the excesses of the military - industrial complex and the jingoistic and nonconservationist attitudes its current political supremacy fosters. Bill, you and I have discussed these issues over a period of years with, as I see it, little disagreement as to goals, but much disagreement about strategy for achieving those goals.

My ambivalence with your recent paper with Ed devolves upon an agreement with you in principle but a belief that you have over - simplified the issues and forgotten the pragmatic philosophy upon which the ecological approach rests. Instead I see your recommendations to avoid accepting "tainted" money from DARPA or other military budgets as self - defeating in the long run. I remind you that Gibson's perception laboratory was funded for decades by the Office of Naval Research, as was Jim Jenkins and Wally Russell's research on word association norms. It would hardly be fair to call either research project morally tainted by the funding source. I am sure neither of you needs reminding that many of Gibson's earliest insights into ecological psychology came from his abiding interest in the flying of airplanes and was research sponsored by the Army Air Corps, resulting in his first monograph. Hence

ecological psychology benefitted in its inception from military sponsorship.

Similarly, the continuation of this seminal line of research by Rik Warren at the Air Force Aerospace Medical Research laboratory on optically specified egomotion, as begun by him as a student under Gibson at Cornell is a displacement of laboratory site rather than of research interest or sponsorship. Are we to believe that this research now has somehow become tarnished by being housed at Wright - Patterson rather than at Cornell, despite its obvious historical consistency? Is this generation of Air Force money more tainted than previous generations? Is Dean Owen's research or Rich Jagacinski's at Ohio State also tarnished because it was assisted by putatively tainted AFOSR funding? Will my research on ecological control theory be forever morally tarnished because it was begun with a scientist in the employ of the Air Force this summer [1984] while my salary was being paid by an AFOSR fellowship? Should I avoid using the CYBERLAB computer systems at UConn because it was purchased in part by Air Force research funds? You yourselves candidly express moral confusion on trying to adjudicate such "tricky" issues. Perhaps, the above cases seem to be morally "tricky" because the tainted funding hypothesis is logically inconsistent with a humanistic philosophy based on pragmatic realism.

The invocation of the tainted money hypothesis seems to me not only confused and naive but, ultimately, self - defeating, for it detracts from the more subtle but enormously important issues that we should discuss. All the money channelled into research ultimately originates with the taxpayers; that it passes through military agencies does not taint it but may dangerously misdirect it. The main issue is how tax money might best be properly directed for humane causes. Because it is unrealistic to believe the military will be totally abandoned or even drastically reduced in today's cold war milieu, then we must ask how we can contribute to an ecologically

more viable military. Having people like Rik Warren on the inside seems to me important because local policy decisions on research funds allocations is more likely to be for constructive rather than destructive projects. We should work to strengthen our voice in such affairs, not weaken it by pursuing research topics of complete indifference to the military -- such topics as the safe flying of airplanes. Not only do I believe this is an unattainable idealistic goal of basic and applied research, but morally bankrupt as well.

It seems to me you have substituted an admirable but simplistic and potentially destructive idealism in the place of a more realistic and potentially effective pragmatism. Consequently, I would like for you to consider these critical comments in the spirit with which you wrote your paper, namely as a way to further our understanding of the dilemma of being both scientists and concerned citizens in the current context of impending war and ecological disaster.

Let me put a label on this alternative to your strategy of "active noncooperation" by which we might "attempt to disentangle ourselves from the exterminist context" -- that is, a way in which we might entangle their interests with our own. For sake of contrast, let me propose a strategy of seeking "active control" of the decision and policy making in the selection of basic research goals and application of means to those goals.

In the current conservative political context, which is unlikely to change over the next decade regardless of which party runs the show, dropping out, or any other strategy that does not fetter the consciences of the research policy makers and the decision makers who actually administer the policy, is to postpone our responsibility and court destruction of the best strains of humanitarian research. If we are out of the picture, then we play no role in its composition. At least let us make them paint around us.

Let me give you one example: Rik Warren is vying with an unsympathetic OSR for funds for ecological psychologists (like Dean Owen and me) because he is certain that we deserve support at least to the extent that the cognitive scientists receive support from these agencies. If we defer all such funds to cognitive science, given the drying up of nonmilitary funding, then we tacitly agree by forced option that cognitive science has more to offer than we do. They will have the funds for training research assistants, we shall have only those students who can afford to go to school. Are the rich students necessarily more deserving? Of course not, but our failure to fight for funds for less advantaged students would make a mockery of public education and be the grossest of negligence as educators.

And what about the paucity of jobs? Should we abandon the field of human factors and human engineering to traditional motor skills theory, control theory, signal detection and psychophysics, or rescue it from what we, rightly or wrongly, believe to be dead end approaches? There is a flourishing of the job market in the so-called high tech areas of computer applications to cognition and instruction. The money for the research jobs in these areas comes more from the military than anywhere else.

Wouldn't we come closer to meeting our responsibilities as ecologically concerned scientists and educators by infusing our values and attitudes into industry and the military through an abundance of workers and researchers trained in the principles of humane ecological science than allowing by default their ranks to be filled by an ecologically untrained and, therefore, disinterested workforce? Currently, any concerned scientist, like Rik Warren at the AFAMRL, is working against great odds to make our case in the military sponsored laboratories. But to succeed, relevant results from scientists like us, on topics of interest to aviaional psychology, such as solutions to flight simulator transfer of training problems, are sorely needed.

If we make Rik's judgment look good to the military and civilian commanders of the laboratory, his advice will ultimately be sought for selection of the scientists who should be seated on the OSR Advisory Board to determine the way funds are spent. Perhaps, he will himself be selected to serve. Counseling a disinterested, dropout attitude is not only counterproductive to our larger goals but morally irrational.

To see why consider: Of the \$198,000,000 in the OSR budget, 60% will go to basic research and contracts to academics. You consider acceptance of such funds tainted and unworthy of the interests of concerned ecological scientists. Add in the budgets of the other agencies like ONR and ARI and you are talking a billion dollars or so for basic and applied research. Not to be pompous but, excuse me, I consider the bleeding off of such funds to ecologically sponsored research, or any humanitarian research, and there is much being sponsored, a transfusion to help make the nation's scientific priorities de facto more humanitarian if not de jure more humanitarian. Pragmatism permits this, idealism does not.

Such funds can help train potential researchers to do work that contributes to the health, safety, and welfare of the civilian population that flies, who vastly outnumber the military. Let us then not forget our pragmatic philosophy when addressing moral as well as scientific issues.

But surely it is immoral to begrudge the benefit of any increased efficiency or safety to the military citizens who, lucky for us, fly more peace - time maneuvers than war ones, just as you would not begrudge them inoculations to protect them from dreaded diseases or other health care simply because their politics and morality is of a different persuasion. Nor, I presume, would you begrudge the benefits to those that fly in defense of the country. How about for those who fly provoked offensive maneuvers? We would all, however, feel remorse at any use to which such benefits might be put for

unprovoked offensive maneuvers; but I see no realistic way to prevent this short of abandoning the military altogether. Although we have already agreed to try to rid the world of this need for the practice of military maneuvers, what do we do in the meantime?

I would rather play an active role, even if it is but a small one, in helping redirect military funded research to make it more humanitarian and ecologically defensible than abandon the enterprise to those who don't give a damn. I personally would like to see ecological scientists of the highest caliber and moral integrity advising the government on how to spend their vast military budgets, than leave such decisions to the arms manufacturers who are in the business of profit making or unknowledgeable bureaucrats who seek only promotion or power through big budget control.

For whatever it is worth my attitudes have been forged from my participation in a variety of endeavors not uncommon to other concerned citizens who grew up during World War II. My dilemma is not uncommon: I find myself a pacifist who would have fought against the tyranny of the Nazis and Stalin with their penchant for genocide but will not own a gun nor hunt. I fear the need for a strong defense more than I do a strong defense. I would work to remove the need so that the defense weaponry becomes obsolete. I decry the offensive posture of any nation and will not knowingly contribute to it, and would work for disarmament. As a charter member of SANE, a past contributor to the support of the Bulletin of the Atomic Scientists, a worker with Dr. Martin Luther King in Alabama and Tennessee, an active anti - (Vietnam) war protester, a firm supporter of the ACLU defense of our basic freedoms, and, in general, one who admired Gandhi's philosophy of nonviolent (but not passive) resistance (that even countenanced responsible civil disobedience), I portray myself to myself as no lover of war. In sum, I believe in Schweitzer's precept of "Reverence for Life" in all forms but am not an antivivisectionist. Yet all this

being true, after much thought I would accept funding from a DOD source for nonoffensive research.

Am I confused or merely self-serving in my rationalization of this position? I do not believe it is merely self-serving. Although it is difficult to do so, I have tried to avoid this fault in the past. For instance, in accepting an NDEA fellowship in the past I refused to sign the so-called "loyalty" pledge which jeopardized my award -- although I received it anyway. In championing my freedom from institutionalized religion as a youth, I was kicked out of college because I refused to attend a compulsory "chapel" each day at noon; while around the same time I helped a group of politically radical black friends fight for the right of religious congregation. As one who would have fought against Hitler or Stalin because of their genocidal policies, I became a pacifist and declared myself a conscientious objector during the Vietnam crisis, and was willing to face prison (but alas, my resolve was never tested; I was never called). Were these morally schizophrenic acts, as you put it? Or, simply pragmatically realistic, ethical choices, each responsive to different contexts of casuistic constraint [This use of the term "casuistry" is explained at great length in one of the omitted sections -- Ed.]

Now not only would I accept funding for control theory research to be run on a computer partly funded by defense dollars, but am actively seeking funds from the Air Force Office of Scientific Research (OSR) and the Army Research Institute. I also would accept NATO funds or funds from the French Foreign Legion if they were available. (I draw the line at the CIA and the KGB, for I prefer unclassified research, and tend to use this as a barometer of the sensitivity I should show to topics selected to work on; but this is too crude to be reliable).

I recognize that laser physics can foster a means for toxic cleanup, and delicate previously inoperative corneal

and brain surgery, as well as a star wars generation of outer space weaponry. I am no longer morally perplexed by the fact that morphine in one pair of hands can remove pain temporarily and help avoid premature death through shock, and in other hands become a deadly addiction. (Paradoxically, sometimes in the same hands, as in the Barney Ross case). Similarly, a scalpel in the hands of a surgeon can save lives, while in the hands of Jack the Ripper can be a murderous, chauvinistic weapon.

These are complexities but not moral perplexities that we all must live with. Accepting money from a military budget for research on topics deserving of scientific interest or that contribute to the safety or health of people, be they military or nonmilitary personnel, is not merely ethically neutral, nor only morally defensible, but a serious moral obligation. That you obviously do not agree prompts me to try to convince you that this is so.

Therefore please consider these and the previous comments and observations as reasons explaining why I believe you have oversimplified the issues with which we scientists must deal in the current casuistical context of impending crises. We can not afford strategies that might be ineffectual, that waste precious minutes on the nuclear holocaust clock. I am not convinced that the strategy of noncooperation can prevail; hence the need for vigorous consideration of other strategies that may work.

But if we can not come to agree on what is morally certain with respect to such profoundly complicated matters at the present, let us all pledge to continue a tolerant dialogue until we do.

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