

PROVOCATIONS

What Good Do We Really Do?

BY P. A. HANCOCK

AT A TIME when the world is experiencing great social and political changes, I take pen in hand to consider the role of the ergonomist in a world beset by problems that transcend simple national and cultural boundaries. In doing so, I should acknowledge the origins of this thought.

Like many others in human factors and ergonomics, I received an interdisciplinary training in areas such as human biology and experimental psychology, which allowed a degree of access to the diverse concerns of ergonomics. Academic training fostered a strong empirical and "scientific" evaluative approach to the solution of problems, together with a heightened respect for the role of theory in the generalization of such solutions.

Again, like others, I was strongly attracted – one might say overly attracted, even given the academic reward structure – to the study of so-called high-tech, high-frontier, and high-visibility questions. Publications led to proposals, texts, and grant resources to pursue this traditional and expected research procedure further. Despite a continued effort in this direction, talks with many colleagues forced me to consider more and more the central question, "Just what good do we really do?"

There followed numerous rationalizations concerning my individual role, and the role of ergonomics in general, in the human enterprise. Rationalizations include my personal limited energies and

aspirations, a relative collective impotence with respect to extant power structures, and a number of other "unrealistic" reasons why ergonomics touches the lives of so few on our planet, while being so important to the survival and well-being of our whole species.

These concerns were further fostered by careful attention to the

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remarks of Nigel Corlett at the 1988 meeting of the International Ergonomics Association in Australia when he communicated explicitly what I should have known and what should be part of every ergonomics curriculum: that as agents of change in a social context, we in ergonomics are political agents, whether or not we wish to be or are conscious of it. In pointing this out, Corlett raised important questions as to our own individual roles and those of our professional organizations in becoming active and even militant in championing our collective aims and endeavors. How far this implicit political function is made manifest as an explicit political role on behalf

of individuals and professional societies is a major question that we, individually and collectively, must confront.

Indeed, this question is one that permeates even the interpretation of the theoretical constructs that found our knowledge base (see Flach and Hancock, 1992; Flach, Hancock, Caird, and Vicente, in press, with respect to interpretations of Gibsonian constructs as applicable to human factors). We must not underemphasize our own importance. Our work and proof of our utility must be brought to the notice not only of managers of sponsored projects but also that of political leaders in the society we serve.

My feeling of unease was further inflamed by Neville Moray's address to the Fifth Mid-Central Human Factors/Ergonomics meeting in Dayton, Ohio, in 1990. He referred to Raymond Nickerson's chapter in a book entitled *Robotics, Control and Society: Essays in Honor of Thomas B. Sheridan*, which addressed the explicit consideration of the application of human factors to the world's major problems. To the question of how much consideration is given, the answer was: "not much." I will give one critical example and express my own unfortunate response and subsequent encounter with that unforgiving teacher, Humility.

Like others, I, implicitly and by verbal witticism (or so I thought at the time), criticized the appearance of Ian McClelland and Joan Ward's article on the ergonomics of toilet seats in a 1982 issue of *Human*

Factors. Was it useful ergonomics, or human factors? Should it have appeared in the journal? Unlike others, I, who knew Dr. Ward to be an able and experienced scientist, should have known better. The ergonomics of excretion is perhaps a microcosm of the whole present polemic. Each episode of excretion and/or micturition uses, in the countries that employ the water closet type of system, a "flush" of water equal to some gallons. Further, excretion, even in countries with a bidet, requires paper to dry and clean the area of the anal sphincter. Depending on diet and

"AS HUMAN FACTORS PROFESSIONALS, we are not sufficiently asserting ourselves and what we stand for." Thomas B. Sheridan raised this concern in a 1991 *Human Factors Society Bulletin* article in connection with the way we, as human factors professionals, tackle problems related to humans' use of technology. We agree.

We further submit that we are not asserting our human factors selves or taking a stand on a diversity of issues that should be legitimate concerns of the human factors profession. A core sample of contemporary human factors topics (see, for example, the Proceedings of the Human Factors Society 35th Annual Meeting, 1991) in research and application indicates such areas as perceptual and cognitive factors influencing performance in aerospace systems, usability testing, hypertext and multimedia, alcohol beverage warnings, forensics, human factors issues in medicine and the nuclear power industry, industrial ergonomics, individual differences, test and evaluation, training, color displays, and information.

These are mainstream, traditional human factors issues. But what about the diversity of issues that are the mainstream factors of human lives? What about crime prevention, toxic-waste disposal,

cultural behavior patterns, these events occur several times per day per person.

I can already hear numerous flippant comments about "basic" research and, indeed, plead guilty to such observations myself. However, it is possible that simple ergonomics ideas in this realm will contribute more to continued human existence on this planet than will all the works on fighter aircraft collectively assembled. The future division will be between those rich in food and water and those poor in food and water, depending on natural resources and population pressure.

health-care system abuse, pollution controls, and speed limits? We echo Tom Sheridan by asking, "Aren't these human factors issues of the most basic kind?"

This column is a forum for airing concerns and for raising issues that are off the beaten path but have very direct and significant human factors implications. We call these issues "provocations." In each issue of *Ergonomics in Design*, we will present a provocation that will range from aspects of daily life to sociotechnical issues associated with automation and complex systems. We will endeavor to present provocations from a controversial and less-often-considered perspective in order to foster dialogue, convictions, and even knee-jerk responses.

Our intent is to identify issues that will have both theoretical and practical interest. Responses to provocations will be reviewed, and two or more will be selected for publication in the following issue, depending on length. Provocations from readers are also welcome for publication. Each new issue of the magazine will then present a new provocation as well as responses to the previous provocation.

—Kelly Harwood & John W. Senders
Contributing Editors

Simple changes that save even small fractions of percentages of these resources used in such obvious everyday actions have a vast impact when multiplied by the billions that represent the frequency of occurrence.

How many of us would be responsible and courageous enough to pursue such research in a university setting? To date, not I. Nor am I unaware of developments such as the shower toilet or the low-flush volume toilet. But what have we as ergonomists directly contributed to these products? Other examples abound; I use this one purposely and, I hope, provocatively, and in part in apology to Drs. Ward and McClelland, who displayed more courage and insight than I.

These observations serve to crystallize the fundamental question, "What good do we really do?" The future of ergonomics is no place for apposite Latin tags, *sui generis*. Neither should the range of practical inquiry be constrained by the dusty and sometimes choking confines of academe. It is clear that we have, and perhaps always will have, too few professional ergonomists to solve the continually raised questions of human-technology interaction. Therefore we must train individuals to be their own ergonomists; hence the importance of participatory ergonomics.

Although this suggestion may appear to further dilute the already doubtful standing we hold in the sight of other professions, such as engineering, I advocate such a step. Ergonomics is with the user. In the technical realm, Kantowitz and Sorkin (1983) advocate the maxim, "Honor thy user." However, in the world realm we may extend this to the credo, "Save thy user" – people being both the problem and the promise of the future.

The time has come in an era of change when the human factors profession – if profession it be –

should grapple with the central questions of existence. We have served, in large part, our apprenticeship. We have, in large part, the tools we need. It is time for each of us to step forward, protest our utility, and practice human factors in the real world. I wonder how stony the ground is?

Postscript

In this note I have used the terms *human factors* and *ergonomics* synonymously, though I believe there are differences in history and perspective. This piece started out as a restricted communication to a colleague; hence issues to do with the name of the Society and comments on our mission have begun to overtake the present observations. I am hopeful that the present provocation will swell that tide which is critical to both human factors and the human enterprise in general.

References

- Corlett, E. N. (1988). The investigation and evaluation of work and workplaces. In *Ergonomics International 88: Proceedings of the Tenth Congress of the International Ergonomics Association* (pp. 1-10). London: Taylor & Francis.
- Flach, J. M., and Hancock, P. A. (1992). An ecological approach to human-machine systems. In *Proceedings of the Human Factors Society 36th Annual Meeting* (pp. 1056-1058). Santa Monica, CA: Human Factors Society.
- Flach, J. M., Hancock, P. A., Caird, J., and Vicente, K. J. (in press). *The ecology of human-machine systems*. Hillsdale, NJ: Erlbaum.
- Kantowitz, B. H., and Sorkin, R. D. (1983). *Human factors engineering: Understanding people-system relationships*. New York: Wiley.
- McClelland, I. L., and Ward, J. S. (1982). The ergonomics of toilet seats. *Human Factors*, 24, 713-725.
- Nickerson, R. (1990). Understanding and controlling environmental change: Challenges and opportunities for information technology. In N. Moray, W. R. Ferrell, and W. B. Rouse (Eds.), *Robotics, control and society: Essays in honor of Thomas B. Sheridan*. London: Taylor & Francis.

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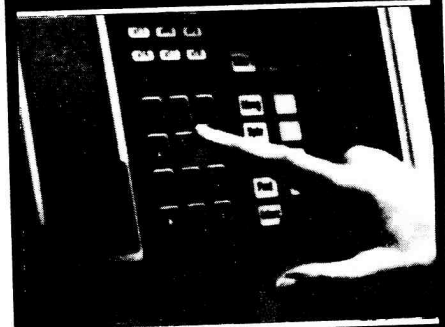
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