PREFACE

By Peter A. Hancock

The Human Factors and Ergonomics Society (HFES) is now rapidly approaching its fiftieth year of existence. At the time of its founding, human beings had not yet ventured into space and computers were large, room-sized entities requiring squads of people to program, operate, and maintain. The world was just recovering from a disastrous global war, and far-sighted scientists were beginning to explore the opportunities for peaceful exploitation of the technologies that had been developed in the heat of battle (Bush, 1945).

Into this flux came the birth of a new professional organization made up largely of those who sought to create a better postwar world by matching technology to humans rather than the other way around. Reading the classics of that era, such as Chapanis, Garner, and Morgan (1949); Craik (1947, 1948); and Licklider (1960), one can sense the atmosphere of excitement, the air of opportunity, and the burgeoning of hope. In particular, Taylor (1957) proposed that the marriage of engineering and psychology could be more than simply a meeting of different disciplines. He speculated, "in starting to contribute to the design of machines, psychologists have begun theoretically and pragmatically to pull together the psychological and physical sciences. Just how far they can be moved toward one another at the concept level has yet to be seen." (p. 258).

In the intervening decades, the discipline of human factors/ergonomics (HF/E) has begun to come of age (and see Marek & Pokorski, 2004). The flowering of human-computer interaction studies, issues of system usability, specializations in aviation and aerospace research, and problems associated with nuclear power control facilities has each triggered developments critical to the growth and diversity of HF/E. Contemporary areas of interest are now even broader, and a continual concern of HFES – and indeed the science itself – is the constant threat of fractionation and "balkanization" as specific areas get "hot" and move to establish themselves as foci in their own right.

However, there is much more to hold us together than the momentary, pragmatic forces that threaten periodically to tear us apart. The continuing search for a unified theory of human-technology interaction is one that embraces many disciplines. It is a search that asks crucial questions about purpose, upon which the processes of technology are predicated. This question remains as vital for us today as it was for those who envisaged a time of peace emerging from a time of war, now almost five decades ago.

The volume you hold in your virtual hand is a collection of essays derived from the presidential addresses from Human Factors and Ergonomics Society annual meetings. Some are taken from published texts an others have been kindly resurrected and revised by the contributing authors from their notes. The great value of the work lies in three basic elements.

1. It can serve as an introduction to the area for interested laypersons, advanced undergraduates, or graduates who may be searching for a specific research focus.
2. It can be used by practicing professionals to bolster and support the case for their contribution by acting as an information source and introduction to fellow professionals who may have heard of but have not directly encountered human factors/ergonomics.
3. It acts as an archival record of the progress of HF/E across the decades.

Here, the reader can not only enjoy the contributions of each specific individual but, by a pairwise comparison across the respective chapters, grasp the evolution of topics of interest and concern over time. The document, being a virtual entity, is a living one. It is my hope as HFES Historian that as time goes by, I can encourage other presidents of the Society to add their own individual

contribution in order to further elaborate upon this individual and developmental theme. And, of course, there is potentially one new chapter each year!

For me personally, Alphonse Chapanis's address, "Words, Words, Words" (the first chapter), was one of the very earliest articles I ever read on human factors, which parenthetically was set in a class given by Stanley Roscoe, another past HFES president. As might be expected, the present selection of addresses covers a wide range of topics.

Chapanis begins by reminding us that much of human factors is concerned with communication and that the understanding of linguistics is exceptionally useful and important in so many practical applications. The following year, Julien Christensen (to date the only two-time HFES president) raised the crucial issue of individual differences, a topic that has come to the fore more and more as the years have passed.

In terms of the breadth of topics, the epitome is perhaps H. MacIlvaine Parsons' observations on "Life and Death." He explained how death often plays an unsuspected but central role in modern life and asked hard questions about the value of life while maintaining that much of the issue pertained to human factors concerns. Richard Pew's "The Ten Best Ways to Embarrass a Human Factors Specialist" presents arguments commonly raised against the importance of human factors. Pew responded by offering practical advice to the human factors professional in how to answer these objections, and his wise advice is as valuable and pertinent to professionals today as it was the day he first presented it.

One of the most successful of all presidential presentations was that given by Douglas Harris concerning his observations on success stories. Eventually made into a useful and popular videotape (*Human Factors Success Stories,* 1984), this presentation provided a number of vignettes in which human factors interventions proved to render great value. Set alongside Steve Casey's important and most readable book *Set Phasers on Stun,* which illustrated vignettes concerning human factors problems, Harris's observations give the complimentary, positive side by emphasizing success.

According to Richard Hornick, dreams can become reality, which eventually result in destiny. However, these dreams can rapidly become nightmares that remind us again of the importance of human factors in how technology exerts its effects. Thomas Sheridan's notes are representative of his career-long interest in questions of automation, and the interested reader can find a much larger exposition of his work in *Humans and Automation,* copublished by HFES (Sheridan, 2002).

The "Everybody Knows" problem was presented by Kenneth Laughery as a warning about the assumptions we all make. He was especially concerned, as we in human factors should always be, about the disconnection between the mind of the designer and actions of the user. It is all too easy for the designer to make assumptions about what the user "must" know. When that assumption is incorrect, as it frequently is, bad things happen. The message is that we have to design things that forgive these human errors and limitations.

Hal Hendrick subsequently made a great appeal to consider the win-win situation of human factors/ergonomics by protesting that good ergonomics practice also makes sound fiscal sense. His aphorism that "good ergonomics is good economics" has become a widely promulgated sound byte that has helped justify ergonomics interventions with the bottom line in mind. Whether good economics itself is good remains very much open to discussion and brings us back again to questions of purpose and intent.

From the financial concerns to personal concerns, Arthur (Dan) Fisk used the example of his mother to remind us of the crucial role of human factors in aging. Following his mother through a normal day, he pointed out the myriad occasions on which HF/E innovations can alleviate and even negate the intrinsic problems of aging. His work at Georgia Tech, alongside Wendy Rogers (also an HFES president) has explored in laudable depth the way in which our own domicile can have a pivotal role in everyday quality of life. These efforts have continued to

reinforce the crucial observation that improvements made for older individuals almost inevitably percolate to the advantage of the whole spectrum of users.

David Woods reminded us to take one step back from any problem to understand how we – as scientists, researchers, professionals, and teachers – are always part of an environment in which these events occur. His insightful commentary points to the understanding to be derived from this fundamental observer-observed paradox. Woods was the first to establish his HFES presidential address as a Web-accessible report, setting the precedent for the inclusion of the present work as a Web publication.

Finally, in this edition, William Howell looks to our future and asks what we, as a Society, wish to achieve – it is a suitable valediction to such a diverse set of offerings and yet will represent an important benchmark when the history, yet to be written, has come to pass.

Human factors/ergonomics lies at the very confluence of so many of the diversities of life. True, HF/E is a science, but as contributors to design, those of us in the field should have almost as much concern for art, or at least creativity. Seeking general principles, we should never forget the nuances and subtleties of each individual (and see Cronbach, 1957). Partaking of both engineering and psychology, we have to embrace both objective and subjective aspects of reality. Finally, and most crucially, we are the mediators between people of society and the technology that they cause to have created. If, as it is reasonable to assume, that technology is the most powerful force that shapes our world today, those who arbitrate this intercourse are surely those who exert great power and influence (for either good or bad) as to the direction in which human society proceeds. Our present political conflicts attest to this power, and we must embrace this most daunting of challenges if HF/E is to achieve the vision of those who helped create it, now some fifty years ago. I hope that this living document can help us move in the right direction.

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