Preface

Human factors, or ergonomics, is an essential consideration in development and design work and has been receiving increased emphasis at IBM. Human factors work at IBM is the subject of the papers in this issue of the *IBM Systems Journal*, a theme which will be continued in the next issue with additional software papers that focus on this subject, but under the broader concept of usability. The papers in these issues sample work covering hardware and software design, publications usability, and basic research in the psychology of man-computer interaction.

Human factors studies have existed in IBM for some time, as demonstrated by the twenty-year existence of the IBM Human Factors Center at San Jose, California. The operation of this center and some examples of its activity are the subject of the paper by Hirsch. The many different facets of human factors are illustrated in the discussion of six typical experiments at the Center.

Specific experiments are also the subject of two other papers. Judisch, Rupp, and Dassinger write about their work in conducting experiments to determine the most effective format and medium for IBM maintenance manuals. The paper by Miller discusses an experiment where people who were unfamiliar with computers wrote natural language procedural instructions for specific tasks. These instructions were analyzed and the results used to predict what features should be a part of programming languages.

One way to study the impact of human factors on computers is to follow a case study of the role human factors plays in the design and development of terminals intended for users with no computer experience. Ominsky's paper is such a case study, discussing studies made, alternatives considered, and tests performed in developing a plant data communication system.

Another way to look at human factors in interactive computing is as a communication process between man and machine. The paper by Thomas and Carroll is not a human factors case study, but rather a review of research conducted on the communication process. Some of the areas covered are how people name entities, how people express relations between entities, and how complex communications such as business letters are created. From this research, human factors principles can be derived and applied to computer interface design.

These papers, and the papers that will focus on usability in the next issue, present an opportunity to become familiar with human factors activities and their essential impact.

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