11.30 DR. A. CARPENTER and DR. J. MORTON (M.R.C. Applied Psychology Research Unit, Cambridge)—*The meaning of sounds.*

It would be a mistake to regard auditory perception as a phenomenon involving a one-to-one correspondence between elements of a sound and internal reactions. In the first place, provided certain conditions are satisfied, distinct sounds
[89] merge together to give the impression of a third, totally different sound. Secondly, the interpretation of a sound, both our identification of it and our reaction to it, are heavily biased by the context of the sound, i.e. the other sounds in the environment and our existing information as to likely sources of sequences of sounds. In addition, our estimation of the physical properties of the sounds, especially loudness, are biased by our knowledge of the source.

12.0 J. E. J. JOHN (Department of Audiology and Education of the Deaf, University of Manchester)—*Auditory deprivation in childhood.*

This paper is particularly concerned with children who are severely handicapped even when using hearing aids. The effects of minimal auditory experience may show in insecurity, tenuous personal relationships, incomplete conceptualisation and frustration due to inadequate ability to
[90] communicate.

Difficulties in communication affect the total intellectual and social life of the child. Learning to use the language of one's own community depends on auditory feedback and imitation and deaf children have to learn from severely reduced cues. Nevertheless there is much redundancy in speech and if the children are exposed to sufficient auditory experience they may learn to interpret the cues which remain when those which for normal listeners are primary have been removed.

Afternoon

Computer-assisted instructional systems:

2.30 B. R. GAINES (Psychological Laboratory, Cambridge)—*Steps towards computer-assisted instructional systems.*

The *teaching-machine* is a natural development of conventional classroom audio-visual aids—if the functions of the blackboard, books, the slide-projector, the gramophone, and so on, were logically and consistently projected along the lines

of current technology, then a system with many resemblances to present *teaching-machines* would result. Furthermore this system would make
[189] technological demands which could best be satisfied by some form of stored-program digital computer.

It is the purpose of this paper to trace the possible evolution of computer-aided instructional systems by outlining the functional requirements for advances in present audio-visual aids, and describing how these may be fulfilled by both special-purpose and general-purpose devices within the realm of current technology.

3.0 DR. G. PASK (System Research Ltd., Richmond, Surrey)—*Teaching as the control of a learning process.*

Teaching is viewed as the control of a learning process. This philosophy has led to the use of on-line control procedures. The simplest of these is a loop which modulates problem difficulty as a function of performance measures. These elaborate systems called 'adaptive meta-systems' admit the
[190] higher level discourse of a tutorial conversation and allow the student (rather than the model built into the teaching mechanism) a degree of control over the form of the teaching process which depends upon the students' success in achieving an instructional goal (such as solving a given class of problem). Most of our work has been connected with perceptual motor and cognitive skills and the data stems from this field. However it seems possible to extend the method to other types of education.

3.30 MAX SIME (Department of Psychology, University of Sheffield)—*Computers as test-beds for teaching systems.*

It is a large step from the simple branching teaching machine to the digital computer when measured in
[191] terms of their decision-making facilities. The value of these facilities largely depends on our ability to relate different teaching strategies to the measurable characteristics of a student's performance. The paper will discuss a computer-based teaching system as a flexible research tool for investigating such relationships.

Monday, September 4
Morning

Experimental psychology:

10.0 DR. M. HAMMERTON (M.R.C. Applied Psychology

Gaines, B. R. (1967). Steps towards computer-assisted instruction systems. In British Association for the Advancement of Science Annual Meeting, pp. 102-103. British Assocation, London.