there must be some awareness of the transition periods of science in order to develop perspective on the progress of man's society. For example, our chapter 13, "Transition from determinacy to indeterminacy," sets the stage nicely for the transition from the firm cause-and-effect attitudes of the Newtonian period to more recent developments in thermodynamics and atomic science. We also use large lecture groups and small recitation groups, and believe that the laboratory work should be informal but involve individual effort as much as possible.

The most difficult aspect of any course has to do with clarifying concepts for the student. For this purpose, integration of concepts and topics to reveal common underlying features of disciplines is very important. We utilize several major themes, such as the probability concepts, the laws of thermodynamics, and energy conversions. By far the most effective theme for unifying and for relating natural phenomena with the personal world of the student evolves from the concepts and techniques associated with control systems. These involve feedback interrelationships and information and are more generally referred to as cybernetics. With this approach it becomes possible to relate situations to each other. The relationships may involve events that are in close proximity, or they may relate the past to the present and to the future. The relevance of things, which students complain is missing in college instruction, is brought home by this approach, for the elements and the functions that enter a situation or system may intermix mechanical gadgets and human activities. Feedback may be in the form of a mechanical thrust or an idea. When once the student learns to analyze mechanical or social situations in these terms he is not likely to regard science as outside his personal interests or capabilities.

We avoid frontal attacks on the "scientific" method, explanations, logic, or symbolism. The halo that is usually accorded the physical or "exact" sciences falls away when we discuss how poorly understood are their basic concepts. The halo is restored when we show how much has been accomplished despite this lack of basic understanding, but in the process the behavioral disciplines and the humanities also gain stature. In fact, science and the scientific effort emerge as very human activities.
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Fig. 1. Approximate locations of Mariner 6 near-encounter pictures. Heavy lines delineate the wide-angle frames. Small rectangles mark the narrow-angle frames.