Name dropping appears to be as prevalent in educational research in general, and in curricular research in particular, as it is in society, but somewhat less effective. Nevertheless, it does have some of the same outcomes as its social counterpart. We refer to a rather glib use of terminology as a general practice and to the careless use of 'families of terms' in related areas. The 'family' with which we intend to deal here concerns a mode of learning much advocated and even hailed by educators as 'the' method of instruction. We refer to the mode of learning variously called: 'discovery', 'inquiry', 'enquiry', 'research', and 'being a scientist for the day'. Each of these expressions is often used without due regard to the need for definition, or without due regard to meanings already defined.

It is the purpose of this paper to analyze the processes and products involved in this type of learning, to establish some of the relationships among the terms involved, and eventually to set up a framework for the identification of these terms. This framework could then be used by teachers to describe precisely the nature of the activities in which their students are engaged, and by researchers in education, to establish a precise framework for their investigations.

An example will clarify the need for identification and differentiation of terms.

The term 'discovery' is frequently used to designate experiences such as that ascribed to Galileo when he noticed a particular regularity in the swinging of a chandelier, or such as that ascribed to Archimedes, when he observed his apparent loss of weight, as he lowered himself into his bath. Now the same term is often used with reference to students who are assumed to be dealing with similar situations. Thus when one student freely examines a pendulum and another immerses an object in water, and they subsequently make knowledge claims related to those of Galileo and Archimedes, we often say that they are engaged in 'discovery'.

There are, however, major differences between what appear at first glance to be parallel situations. Archimedes was completely on his own, both in his decision to take a bath, and in his observation of his own weight in relation to the water line. The whole structure of his investigation must have been a

* This paper was prepared while the authors were visiting professors at the Ontario Institute for Studies in Education, during the summer of 1975.
completely original groping in the dark, to which neither he nor anybody else could foresee the outcome. Our hypothetical student was in a very different situation. The learning activity in which he was engaged was almost certainly suggested by a teacher who probably also provided the necessary equipment. Furthermore, the fact that this constituted a problem situation was probably pointed out by the teacher. The source of student activity was certainly not a 'groping in the dark'.

Galileo's investigation was more complicated since more parameters were involved. Presumably it is more complicated for the student too. A student seeing a swinging chandelier might well concentrate his major interest on who, or what, had set it swinging. His teacher would in such a case suggest that this was a nonproductive distraction, and would direct attention to more 'significant' aspects of the investigation. Although Galileo's observation was performed in a natural setting, he succeeded in focussing his attention on the major variables of the phenomenon, despite an infinite range of distractors. By contrast, a 'discovery learning' approach confronts the student with an already abstracted form of the phenomenon, set up so as to direct attention to a very limited number of variables and thereby to limit the range of distractors. A student doing discovery learning (no quotation marks!) at the level of Galileo's investigation, would merit Galilean rank. He would be working at the level of a scientist who isolates the relevant phenomena from an infinite set of distractors without the prodding of a teacher who 'has seen the movie'.

A further difference comes to mind between original discovery on the one hand and 'discovery learning' on the other hand. In the two cases of original research to which we have referred, those of Archimedes and Galileo, each of the investigatory processes led to a knowledge claim concerning an isolated phenomenon, and then, in accordance with the researcher's world view, to a knowledge claim concerning a broad theoretical structure. By contrast, in the case of a student whose guided investigation might lead him to a knowledge claim concerning an abstraction from the isolated phenomenon being examined, any extension of his claim to the formulation of a theoretical structure would surely arise only as a result of extensive prompting, or instruction, by the teacher.

Let us consider a parallel example in another field of instruction.

(1) The teacher gives a student the set of arithmetical statements:
   \[ 2 + 2 \times 3 = 2 \times 4 \]
   \[ 5 + 5 \times 7 = 5 \times 8 \]
   \[ 11 + 11 \times 16 = 11 \times 17 \]

(2) The teacher suggests that there is a pattern which may be retrieved from the set of statements.