Educators would certainly agree that mathematics education should be meaningful to the student—and I am no exception. But what could the meaning of meaningful be? Here one finds a variety of opinions.

One attempt to insert meaning into mathematics education took place as part of the curriculum reform movement in the 1960s. The drill and practice of traditional mathematics teaching was to be replaced by real understanding, which was interpreted as understanding logical relationships between mathematical terms. Meaning was to be established in terms of "logical honesty". If students were enabled to see structural connections behind algorithms, then more meaning would be brought into the classroom.

Meaning can also be described in relation to social structures, which requires that the whole educational process be taken into consideration. To introduce students to the culture of mathematics means an enculturation. And in order to ensure successful enculturation, the teacher must know about the culture to which the students are introduced as well as that from which they come. It is essential, therefore, to relate the content of the educational process to the students' background. I see the definition of meaning in relation to the cultural background of the children as a huge improvement on the definition of meaning as related to logical structures. Nevertheless, I shall also emphasise some shortcomings of this way of pointing out meaning in education.

My book *Towards a Philosophy of Critical Mathematics Education* (Skovsmose, 1994) contains descriptions of a few examples of project work in mathematics education carried out in secondary schools (for other examples, see Nielsen, Patronis & Skovsmose, 1999; Alrø & Skovsmose, 2002). These descriptions served to clarify some of those concepts by whose means I sought the goal set out by the title of the book. In that book I only touched briefly on the notion of meaning, although the whole study can be interpreted as a concern for meaning in mathematics education. In this chapter, I reinterpret some part of my work, and with reference to two of my examples, I try to make more explicit the notion of meaning.
1. DIFFERENT INTERPRETATIONS OF MEANING

Philosophers have given a variety of interpretations of the concept of meaning. In the first paragraph of *Philosophical Investigations*, Ludwig Wittgenstein (1953) quotes Augustine, who interpreted meaning in terms of reference: A word has a certain meaning because it refers to a certain entity. A related theory is expressed by Wittgenstein (1961) in the *Tractatus Logico-Philosophicus*, in which language is clarified as a “picture” of reality. This concern about reference is also part of the work of Gottlob Frege (1969), who refined his philosophy of meaning into a theory of “sense” and “reference”. Along with the interpretation of meaning in terms of reference is the assumption that the meaning of a composite expression is determined by the meanings of its linguistic elements. In other words, the meaning of a molecular expression is a function of the meanings of its atomic constituents.

In *Philosophical Investigations*, however, Wittgenstein (1953) criticises the referential theory of meaning and suggests that it should be replaced by a different understanding of meaning. He finds that the meaning of a sentence must be related to the use it is possible to make of the sentence. Maybe one can even identify the “use of the sentence” with the “meaning of the sentence”. This identification opens a new horizon in the philosophy of meaning. Now the meaning of the sentence can be related to the complexity of the whole situation in which the sentence is used. The meaning of a sentence has to be understood in “the stream of life”.

Instead of looking for the meaning of a word, one looks for the meaning of a linguistic act. This interpretation, however, introduces another alteration. If the meaning of a sentence can be interpreted as the use of the sentence, then “use” and the “context of use” become semantic concepts. Why pay special attention to the notion of a sentence? To look for the meaning of (the use of) a sentence is no longer the pre-eminent choice. One might as well look for the meaning of (the use of) a formulation, a gesture, a text, an attitude, or any other action.

This broader interpretation is further developed by Jürgen Habermas (1984) in *The Theory of Communicative Action* (especially in the chapter “Intermediate Reflections: Social Action, Purpose Activity, and Communication”). In order to define *illocutionary meaning*, Habermas draws upon the speech act philosophy of language initiated by Wittgenstein (1953) and by John L. Austin (1946, 1962) and further developed by John R. Searle (1969, 1971). What is done when a speech act is performed? To answer that question, the *locutionary content*, *illocutionary force*, and *perlocutionary effect* of the utterance are investigated. Meaning comes to refer to the practice, the context, and the commitment of the persons who take part in the communicative action. To understand meaning, therefore, presupposes a view not only of the person who expresses a statement but also of the whole situation in which the communicative action takes place.

This approach to the discussion of meaning can also be illustrated by a reference to the work of Anthony Giddens. In *The Constitutions of Society*, Giddens (1984) describes a theory of structuration. He emphasises that “human action” plays a basic role in sociology, and he rejects empiricism and structuralism, which have assumed that “sociological facts” constitute the ultimate object of sociological studies. When,