

understand. How come the Moon is still in the sky while the Sun has risen?' And the teacher, who apparently felt obliged to give an answer, replied: 'The day has not completely come yet, the night has not completely gone and the little Moon hasn't had time to go away.'

The science activities at the beginning of the day were always preceded by an everyday ritual which was to observe, describe and discuss the day's weather. During this activity, as teachers have acknowledged, children express bewilderment, fear or excitement about weather phenomena: 'I want you to explain what lightning is', said one 5-year-old boy. 'When two clouds bump into each other with different forces a flame of fire is created', responded his teacher.

'Why, when I put a spoon in a glass of water, does the level of water rise?' another 4½-year-old asked her teacher during one of these science activities. On another occasion, a 5-year-old boy, after his teacher had conducted a floating-and-sinking demonstration and concluded that 'wood always floats while metal always sinks', pointed at the bottom of the bucket used in the experiment and asked her: 'Do you think there is magnetism down there?' And I was astonished when a 5½-year-old girl, during a topic entitled 'A trip to the Moon', asked her teacher: 'Why is it that an astronaut can take a space walk but a plane passenger can't?'

Handling the children's questions

These questions and ideas involve scientific issues that are quite important for the development of children's science concepts and some of them are quite complex. How can we handle them so as to make constructive use of the valuable opportunities they represent? Do we give a straight answer? Does a straight answer contribute to the children's understanding? Does the com-

plexity of the issue in question allow the teacher to give an answer that is scientifically acceptable?

Some of the early-years teachers I talked to during my research project asked: 'Does it matter if an answer to a child of such a young age is not scientifically correct?' This is a serious issue. Zaporozhets, Zichenko and Elkonin (1971) note that we cannot assume that children of pre-school age who raise questions such as these are not interested in the credibility of the answers they get and are ready to be fobbed off with wrong answers. Obviously, these authors

WHAT CHILDREN CAN DO IN COOPERATION TODAY, THEY CAN DO ALONE TOMORROW. (VYGOTSKY, 1983)

continue, whenever an adult fails to help a child who is interested in something completely mysterious to him or her, the child is forced to arrive at creations of fantasy.

So what should early-years teachers do? The issue of how to make constructive use of young children's science questions and ideas has occupied researchers in the past (e.g. Jelly, 1985; Harlen, 1996). Some of the children's questions, like some of those presented above, are difficult for the teachers to answer, not only because of their complexity but also because their answers, even if the teachers know them, might not be accessible to children of such a young age. However, the questions can constitute an invaluable tool in teachers' hands. They can lead to investigation and exploration that brings the children into contact with lots of scientific information, stimulates their thinking and brings them closer to understanding the concepts involved and the issues they are concerned about.

With the guidance of their teacher the children can try to find out, for example, why small toy

boats float as big ships do and that it is not magnetism at the bottom of the bucket that makes the iron sink, but some other factors. They can, together with their teachers, seek out information in children's books on what happens to the weight of things and to the Earth's atmosphere when we go far away from the Earth, or on how lightning and thunder are created. Enquiry and investigation can lead children to new questions. Assisting children to move toward finding answers to their questions, answers which are often of a higher level than that of their mental development, makes use of the 'zone of proximal development', leading children on to what they can not yet do. What children can do in cooperation today, they can do alone tomorrow (Vygotsky, 1983).

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