Mapping Thinking

The Idea

In order to understand our thinking, we use all kinds of metaphors. Without them we would be blind to the process of thinking. One of the metaphors is the idea of a "map": the mind is conceived of as something spatial in which our thoughts are located and where connections of all different kinds are established. The process of thinking is conceived of as the travelling along these connections from one thought to another.

The expression "mapping thinking" is instructive in two ways. First, when we want to think properly and constructively, we have to map our thoughts out and visualize the connections between them. Expressions like "On the one hand ... ", "On the other hand ... ", "From this perspective ... ", and "Look at it a bit more closely" or " ... from a different angle" all suggest that a main part of our thinking is the struggle for a spatial organization of our thoughts. One way of representing this organization is a map. Secondly, in relation to our thinking, a map has a double function. We can use a map, but we can also make a new one — for ourselves or for others, in daily life or in school teaching. In cognitive psychology the idea of a map is fairly common: cf. Ulric Neisser, *Cognition and Reality*, 1976, Ch. 6.

As we use maps to find our ways in the empirical world, we also — metaphorically — design and use maps for our mental world. Pictures, diagrams, schemas or flowcharts can function as such maps. Hardly anybody needs to be convinced of the importance and necessity of such maps in the process of acquiring knowledge. Sometimes the structure of our knowledge is so evident that we map it out almost automatically. It is comparable to the situation of a first visit to Manhattan; even without a map one knows his way around. But in Paris or Amsterdam, the same visitor depends much more on a map, either on paper or in his mind. Similarly, one can hardly imagine an issue of *Scientific American* without such mental maps as pictures or diagrams. Even those who are fairly well acquainted with the topics of the contributions still benefit enormously from such maps.

The function of maps is neither illustration nor the addition of new information. They provide us with a "leader" with which we can organize numerous bits of information. They enable us to keep our minds organized, not only as far as new information is concerned, but also in the integration of new knowledge (facts, concepts, rules, methods, etc.) into the previously acquired knowledge. Because thinking involves a permanent process of reconstructing the old mind in the light of new contributions, maps that guide and lead us in this task are indispensable.

The Characteristics

Mapping is an indirect and partial representation of reality. In an indirect, metaphorical sense, the line on the map "is" the road that has been mapped. But the road can be mapped in several ways and what counts as a road depends on the chosen approach.

One of the main differences between the map and the mapped part of reality is that on the map much is left out. This constitutes both a strong and a weak characteristic of a map. It guides us by means of what is left out (because that would confuse us); but at the same time, it may give us a mistaken, i.e. only a partially correct, view of reality. That becomes clear when we compare different maps of the same area. All may be correct maps, but nevertheless they show different structures. This depends on the elements that are selected (waterways or roads), the purpose they are supposed to serve (for driving or walking), and the perspective from which they have been designed (what is on top, what at the bottom). These characteristics are also true for mental maps as will become clear in this contribution.

Unlike writing, mapping proceeds in a non-linear fashion. All kinds of spatial relations are allowed with only a few words. Moreover, one can look at a map as a whole and see many relations at a time. These two ways of organizing our mental world, the linear and the non-linear ones, correspond to two different styles of learning which we recognize among our students. In general, one can say that the linear way of thinking, learning, and expressing is favored in our educational system. One important feature of mapping thinking, therefore, is that it can stimulate children whose thinking is not much fostered by a linear approach.

Quite different maps can be drawn of the same area. Therefore it is important to compare them and see what they add to each other so that we can achieve a more complete map — one that does not at the same time confuse the structure of the mapped area. Fortunately, it is quite easy to compare different maps (in contrast to comparing different writings) because we can look at them from some distance and view them as a whole.

Finally, there is a serious danger of misunderstanding the metaphor of a map. It is the misconception that a map only represents knowledge, not (mental) acts. A map also contains decisions of how to proceed: how to continue the investigation; where to search for more clarity, evidence, or arguments; how to distinguish the essential from the accidental etc. A map makes visible both our thinking results and our thinking processes. It is important to recognize both functions — especially in the analysis of a classroom discussion.

How to Proceed?

It is advisable to do some form of "warm-up" first. For example, draw a map of the road you take from your front door to the home of a close friend. It will give you an impression of what mapping an intuitively familiar part of the world is like. Also, it will reveal most of the previously listed characteristics and advantages of mapping compared to a fully written description.

Next, turn to the transcript of a classroom discussion and try to divide it into sections. Each section should consist of one major thought or dominant speaker with some additional contributions. Try to capture the main thought or

question in each section separately and write down some loose comments on the section.

Then pay attention to the pattern of interaction among the students and with the discussion leader in relation to the development of the question or argument.

Finally move to the main activity: the mapping and reconstruction of the thinking "in and behind" the discussion. This is done in three steps:

A. Listing all the important concepts in every section;
B. Listing all the important relationships among the concepts;
C. Locating all the concepts and relationships on one map using symbols (logical, mathematical, linguistic) to abbreviate the notation of the relationships. It will take several attempts before a two-dimensional map will show the correct balance between complexity and clarity.

Application

The major question of the transcribed classroom discussion in this issue is: What do the concepts "children" and "rights" each imply and how do they relate to one another? This is a difficult question even for adults and philosophers. Therefore it is of major importance to check whether the children actually make any progress in handling this question and whether they can avoid major mistakes or misconceptions. In order to be able to do so, we have to open up the discussion and make the thinking processes visible.

As Judy Kyle has emphasized in her Introduction to the transcript, this is a student-led discussion in which the student leader participates according to a specific set of rules and guidelines. Some of them become visible when we look at the chart with the interaction pattern of the discussion (see TABLE 1):

The student leader controls the discussion. She does so through five different types of contributions:

R = rephrasing the previous remark (29 times)
P = making a procedural remark (12 times)
C = connecting the previous remark with what someone has said before (5 times)
D = introducing a discussion move (4 times)
O = raising a new (her own) question (7 times)

By these means the discussion leader makes a serious attempt to practice the guidelines that were agreed upon, specifically those that are meant to "produce" progress in the development of the discussed problem.

The consequence of the procedure of name recording is clearly visible: most of the students only speak during two of eight sections, mainly in the format of a dialogue with the discussion leader. Only in Section 7 is there some discussion among the students.

We can say that one of the future goals for this group of students would be to facilitate discussion among each other without abandoning the crucial role of the student leader. This would imply a refinement of the five types of contributions as listed above and a call on all the participants

Table I
Pattern of Contributions

Section	Teacher	Leader (Joanna)	Mark	Fiona	Belinda	Alison	Ashleigh	Marnie	Dawn	Deena	Scott	Lisa	Chris	Randee	Ian	? (Voice)
I	1		2													
	3			4												
	5				6											
	7					8										
	9		10													
	11		12													
	13	14														
	15	16														
	17															
II		18 P					19									
		20 R					21									
		22 R					23									
		24 R					25									
		26 P			27											
		28 R			29											
		30 R			31											
		32 P						33								
		34 D+O						35								
III		36 P	37													
		38 C	39													
		40 -	41													
		42 R	43													
		44 P							45							
		46 R							47							
		48 D							49							
		50 R							51							
		52 R							53							
		54 R+O							55							
		56 O							57							
IV		58 P								59						
		60 R								61						
		62 P									63					
		64 R+D									65					
		66 R									67					
		68 -									69					
		70 R									71					
		72 R									73					
		74 P										75				
		76 R+O										77				
		78 R+C										79				
		80 R										81				
V		82 P				83										
			84			85										
		86 D				87										
		88 O				89										
		90 R				91										
		92 O				93										
		94 P						95								
		96 -						97								
VI		98 P		99												
		100 R		101												
		102 R		103												
		104 R		105												
		106 R		107												
		108 R		109												
		110 C		111												
		112 R		113												
		114 R+C		115												
		116 R														
VII													117			
			118										119			
			120										121			
											122					
			123													
		124 -											125			
			126										127			128
													129			
		130 R											131			
		132 O												133		
		134 R+C												135		
VIII		136 P														
		137														
	138	139														
	140	141														
	142	143														
	144	145														
	146														147	
	148														149	
	150														151	152
	153														154	
	155														156	
	157											158				
	159	160														
	161	162														
	163															
Total	22	63	12	10	4	7	4	4	7	2	7	5	7	2	5	2

to rephrase previous remarks for themselves. Since this is the third session with a student leader, such a refinement is a future goal and not a criticism of the discussion we are analyzing here.

"Rephrasing" should be distinguished from merely acting as a sounding board that reflects the spoken words. Rephrasing here means that the discussion leader (and actually any participant) reformulates the statement in order to check correct understanding and to discover new, more precisely formulated elements for further inquiry.

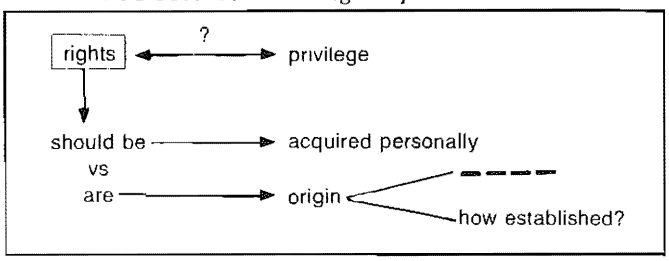
Thinking Maps

The maps of the thinking process throughout the transcribed discussion were developed by the participants of the Lacrosse Workshop. In the interests of clarity, we have chosen to use specific terms even when they were not used by the children themselves. In general, it is recommended to stay as close as possible to the language and expressions of the children.

Of course it is possible to design the maps differently and even to emphasize different concepts or relationships among them. This set of maps, however, represents the discussion in its coherence and consistency: the tenacious pursuit of the question of where rights come from and of the validity of the (common) arguments that children have fewer rights.

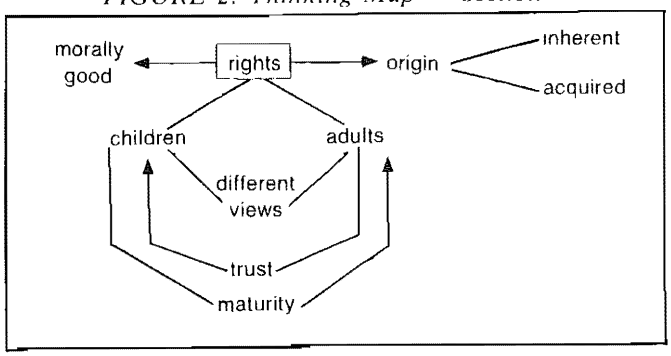
In Section 1, a first investigation is made into the concept of rights:

FIGURE 1. Thinking Map — Section 1



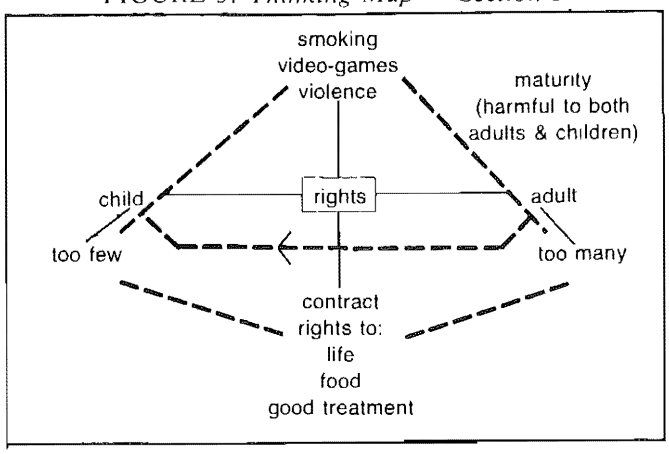
In Section 2, the differences between children and adults in relation to rights are explored:

FIGURE 2. Thinking Map — Section 2



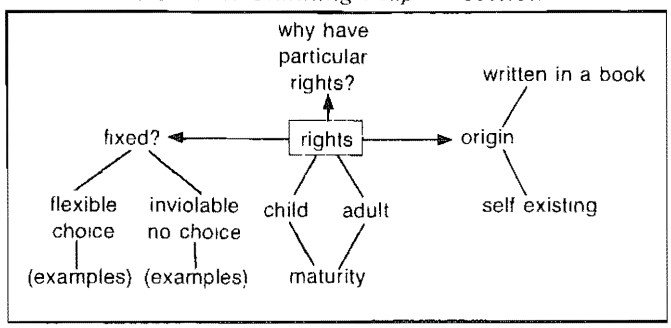
In Section 3, by means of examples, the traditional view of the differences between adults and children (and the consequences of their having rights) is criticized:

FIGURE 3. Thinking Map — Section 3



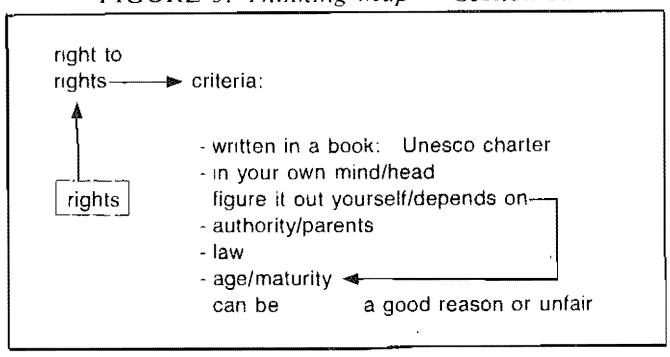
In Section 4, further research is done on the question of the origin and nature of rights:

FIGURE 4. Thinking Map — Section 4



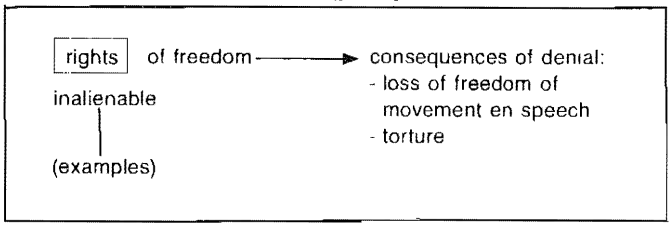
In Section 5, a "metal-level" is discovered: the right to have rights:

FIGURE 5. Thinking Map — Section 5a



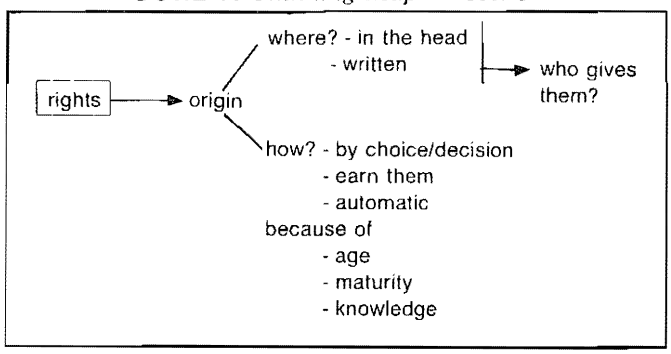
In entries 95 and 97, one element of the nature of rights (i.e. that some of them are inalienable) is demonstrated by the example of freedom:

FIGURE 6. Thinking Map — Section 5b



In Sections 6 and 7, the investigation is summarized and reflected upon:

FIGURE 7. Thinking Map — Section 6

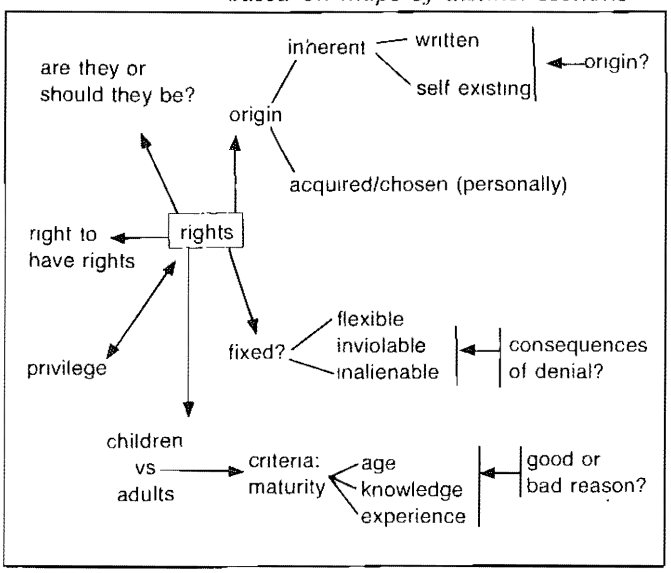


The map of Section 7 is similar to the one of Section 2 with two refinements:

1. some clarification of the problem of the origin of rights is added
2. the concept of maturity is clarified by introducing 'age' and 'experience' (from Sections 3 and 5a).

The map that I have drawn afterwards as a synthesis of the discussion as a whole clearly shows the philosophical approach of the children. First they try to clarify some concepts by making important distinctions. From here, they move into more fundamental questions that are still open at the end of their discussion:

FIGURE 8. Synthesis Thinking Map of Full Transcript — based on maps of distinct sections



These maps provide a solid ground for a continued analysis of the discussion. A more precise identification of the philosophical aspects can be especially fruitful (cf. the contribution of Mort Morehouse elsewhere in this issue) although I should warn against an "overinterpretation" of what the students have said.

Mapping Thinking with Children

At the Lacrosse Workshop, we used mapping thinking as a tool for a better understanding of the children's discussion. But the activity of mapping can appropriately be done with children too. In the section on the characteristics of maps, I emphasized the importance of maps in relation to two different styles of learning. The children can learn through the activity of mapping during the actual session. When they are sitting in a big square, writing on the blackboard may be difficult. But when possible, drawing on the floor has some interesting features: the children have something to look at during the discussion and it makes their invisible question visible as the map shows aspects of the question, important relationships or different points of view. Beyond that, by actually standing on or pointing at some place on the map, they are involved physically more than through talking alone.

Finally, whether or not one uses a video recording, one way of catching the results of a discussion can be to map (individually, in small groups, or as a class) the thinking process in sections. It may reveal where and how new questions arose and it may also show the "scenic route" that the class has taken from the beginning to where they ended up. Such maps of the thinking process and their results can be very useful in the evaluation of the discussion and the decision-making of how to proceed. Drawing maps facilitates the achievement of one of the major skills of the program of Philosophy for Children: thinking about thinking.

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