

'The secret of my educational methods consists entirely of proceeding, without any gaps, from the completion of the first to the start of the second, and in sticking to this second one until it has been mastered as perfectly as the first.'

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A good teacher is a master builder carefully erecting the edifice stone by stone. He knows that first of all you need the foundations, then the walls, last the roof. The bigger the house is to be, the stronger the foundations that are needed. In this he is observing one of Pestalozzi's key principles: the principle of building up without leaving any gaps, what we might call the principle of coherence.

And in this a teacher always bears both the children and the subject in mind. The children's faculties and the skills that derive from them should be developed in an uninterrupted sequence and in a way that is psychologically appropriate. And the subject matter is to be divided up in a way that accords with both the material and the children's psychology, then worked through step by step.

This is all so obvious that I am almost embarrassed to talk about it. I do so nevertheless since masses of pupils fail in the higher classes because they have not understood elementary steps at the lower level and have not acquired fundamental skills. Many of them can still hear the teacher saying, 'I can't wait for you, I have a whole class to teach and have to get on.'

Despite that, the rule is: only continue when the pupils have properly acquired the things they need in order to *understand later units*; only continue once they have securely mastered the simpler skills on which more complex ones are based. The principles that lead to success are: progress from the easy to the difficult, from the simple to the complex, from the concrete to the abstract, from the near to the

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far-off (where 'near' can also mean 'psychologically near'). That is the psychologically correct way of proceeding. This *principle of coherence* is valid for all three areas: intellectual (head), emotional/moral (heart) and practical (hand). If all the new material grows organically from the foundation of what has previously been learnt, then the teaching will be in accord with the pupils' nature.

Pestalozzi compares this to a tree: the trunk rises from the roots, the branches spread out from that and leaves, blossom and fruit develop on them. In the same way a person's education should form an integrated organism that is also open to the world outside. Each part should be joined organically to the rest. And just as a young tree is always a whole organism, not half a tree, a young person must be *complete* at every stage of his development, not just half an adult. And just as nature does not skip any stage, so there should not be any gaps in our educational development. Every new experience, every new piece of knowledge, every new skill should be organically connected to the things the child has already mastered and understood.

We can clarify Pestalozzi's demand for coherent education with insights from the psychology of thought. It is a truism that concepts form the basis of our thinking and speaking. However these concepts should not lie in our minds unordered but should be woven together in a complex network of meaning. This will reflect the possible affinities, antitheses, interdependences and logical combinations of the matter contained in the concepts. Things that belong together in any way in reality will be correspondingly linked and grouped together in our consciousness. A group of concepts which form a meaningful and coherent whole is called a *cognitive structure*. Put in modern terms then, Pestalozzi's demand for an educational process without gaps means that the teacher should be concerned to build up relevant cognitive structures in the pupils' consciousness.

The most disastrous effects of ignoring the principle of coherence can be seen in mathematics and the subjects that depend on it. Things often start to go wrong at the outset, in primary one when the concept of numbers has to be established and continues in primary two and three, when the multiplication tables have to be acquired and automated. Any child who has not mastered this foundation will fail in arithmetic at

every stage. Often the teachers in the later classes, even in the final year of compulsory education, have no option but to start by securing these elementary foundations, because otherwise everything is shaky.

But 'coherence' is not required in mathematics alone, it is necessary in every subject. This is particularly difficult in history, for no historical event can be properly understood without knowledge of preceding events. That is the reason why in many schools the systematic study of history starts with prehistory — with the well-known result that pupils hardly hear anything about modern history because of lack of time. I will return to this in chapter 17.

The problem with history shows that Pestalozzi's demand for education without gaps can be fundamentally misunderstood, namely as a demand for complete knowledge in every subject. This is not only impossible, it is also undesirable. No one would have been more vehemently opposed to the pointless accumulation of knowledge than Pestalozzi. The principle of coherence, of not leaving gaps, does not concern the amount of material but the progression from one stage to the next described here. All of this requires the teacher to allow the child to *take time* at every step in his development, to learn at *leisure*. Nothing is more harmful than to attempt to achieve a lot in a short time. The result will mean knowledge and ability that are superficial and will not provide a firm foundation for what is to be learnt later. On this Pestalozzi says: *In general the methods of my approach to education do not aim at rapid success, nor do they promise it. Humans are the only creatures that Nature brings up slowly and that is what we must do as well; all of Nature's methods banish the outward show of unripe results and require us to wait and trust in long, mundane elementary exercises.*

It is impossible to follow the principle of coherence if a teacher teaches *the class*. Teaching in the spirit of Pestalozzi is always about educating *individual* pupils, even when working with the whole class. Every child has different abilities and if the teacher does not take them into account then there are bound to be gaps in the sense described above. And those children will lose their enjoyment of and interest in school work, since either too much or too little is asked of them. Thus Pestalozzi's principle is very closely connected to what we call *individualisation*.

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Unfortunately the concept of 'individualisation' is used in various senses nowadays. Individualisation in the spirit of Pestalozzi does not mean each pupil has to have his own learning programme, it certainly does not mean isolation and absolutely not the possibility of shortening schooling by one or two years, depending on ability. Individualisation and regular class-teaching are not mutually exclusive. What individualisation means is taking the individuality, the unique nature, of each child seriously and fostering it; it means giving each child our full attention, knowing the way he thinks in the context of a learning sequence and what his difficulties are. Every 'wrong' answer, every awkward remark, every time he falters reflects the way the child is thinking, the way he feels. In such situations the principle of coherence becomes concrete action: the teacher finds the reason for the child's faltering or clumsiness, works out in seconds what small steps need to be taken, and in what order, so that the child can overcome the difficulty little by little. It is not sufficient to take the principle of coherence into account only when planning the year's course or a single unit, it must become second nature to the teacher so that he follows it automatically whenever a difficulty crops up.

For example: an eleven-year-old cannot pronounce the French word '*attention*', even though the teacher has said it for him several times. Listening carefully, he realises that the pupil does not know which syllables have to be pronounced nasally. The teacher therefore gets him to practise each syllable separately, then the first two together, then the last two together, continuing in that way until finally all four syllables are joined and pronounced correctly. But he does not insist it must be done quickly, he lets the pupil start by saying the word slowly, then gradually speed up. (You think that is a matter of course? Not worth going into? I happen to have encountered this situation during a school visit and the teacher, who was working with a small group, allowed me to help the pupil. Practising the word lasted a good minute. You should have seen the broad smile on the boy's face when he managed something he'd always had trouble with before. The shining eyes of a child who has been successful — is that not one of the most glorious things in the world?)

As we read in the newspapers towards the end of 2006, a young man of eighteen sprayed bullets all round 'his' school in Germany before

killing himself. In his farewell letter he said all that he had learnt there was how to be a failure. It makes me think back to the teacher saying, 'I can't wait for you, I have a whole class to teach.'

Naturally I can understand teachers saying that. They are trapped in a system in which *uniformity* is the overriding factor. The principle behind the system is that in a class one must always deal with the same material, make the same demands and apply the same criteria for assessment. Almost everything that is regarded as incontrovertible today makes it more or less difficult (I'm not saying impossible) to meet the needs of the individual child: putting all the children of the same age in the same class, the use of subject-specialist teachers (that a moderate use of this is justified at secondary level, I accept), timetables with their rigid division into 45-minute periods, the excessive quantity of teaching materials, the 'one-size-fits-all' requirements, the marks or other standardised assessment systems. A further difficulty is the over-large class sizes, which, it is true, are not a result of the system but of a shortage of funding. It would be good if education policy could create the conditions and prioritise the solutions which guarantee the classroom teacher the freedom that is necessary for individualised teaching.