

Distinctness of lateral thinking

It may seem artificial to separate lateral thinking and try to teach it on its own when it is so much a part of thinking. There is a reason for doing this. Many of the processes of lateral thinking are quite contradictory to the other processes of thinking (it is their function to be so). Unless a clear distinction is made there is the danger of giving the impression that lateral thinking undermines what is being taught elsewhere by introducing doubt. It is by keeping lateral thinking distinct from vertical thinking that one can avoid this danger and come to appreciate the value of both. Lateral thinking is not an attack on vertical thinking but a method of making it more effective by adding creativity.

The other danger which arises from failure to keep lateral thinking separate is the vague feeling that one is teaching it anyway in the course of teaching other things and therefore there is no need to do anything special about it. In practice such an attitude is quite wrong. Everyone naturally feels that they themselves use lateral thinking and that they always encourage it in their students. It is very easy to have this feeling but the fundamental nature of lateral thinking is so different from that of vertical thinking that it is impossible to teach both at the same time. It is not enough to introduce a mild flavour of lateral thinking. One wants to develop enough skill in it for it to be used effectively not just acknowledged as a possibility.

Organization of chapters of this book

Each chapter is divided into two parts:

- 1 Background material, theory and nature of the process being discussed in that section.
- 2 Practical format for trying out and using the process under discussion.

The way the mind works

The need for lateral thinking arises from the way the mind works*. Though the information handling system called mind is highly effective it has certain characteristic limitations. These limitations are inseparable from the advantages of the system since both arise directly from the nature of the system. It would be impossible to have the advantages without the disadvantages. Lateral thinking is an attempt to compensate for these disadvantages while one still enjoys the advantages.

Code communication

Communication is the transfer of information. If you want someone to do something you could give him detailed instructions telling him exactly what to do. This would be accurate but it might take rather a long time. It would be much easier if you could simply say to him: 'Go ahead and carry out plan number 4.' This simple sentence might replace pages of instruction. In the military world certain complex patterns of behaviour are coded in this manner so that one only has to specify the code number for the whole pattern of behaviour to be activated. It is the same with computers: much used programmes are stored under a particular heading and one can call them into use by just specifying that heading. When you go into a library to get a book you could describe in detail the book you wanted, giving author, title, subject, general outline etc. Instead of all

*A full account of how the mind handles information is given in the book, *The Mechanism of Mind*, published in London by Jonathan Cape (1969) and in New York by Simon and Schuster (1969). It is obviously not possible to cover this matter in detail here for the purpose of this book is different. It is only possible to hint at the type of system involved. Wherever an asterisk occurs in the text (e.g. elsewhere*) those readers who require more detailed information are referred to the other book.

that you could just give the code number from the catalogue.

Communication by code can only work if there are preset patterns. These patterns which may be very complex are worked out beforehand and are available under some code heading. Instead of transferring all the required information you just transfer the code heading. That code heading acts as a trigger word which identifies and calls up the pattern you want. This trigger word can be an actual code heading such as the name of a film or it can be some part of the information which acts to call up the rest. For instance one might not remember a film by its name but if one were to say: 'Do you remember that film with Julie Andrews as a governess looking after some children in Austria?' the rest of the film might be easily brought to mind.

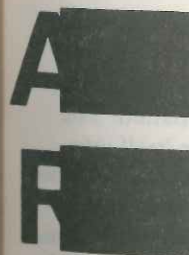
Language itself is the most obvious code system with the words themselves as triggers. There are great advantages in any code system. It is easy to transfer a lot of information very quickly and without much effort. It makes it possible to react appropriately to a situation as soon as the situation is recognized from its code number without having to examine it in detail. It makes it possible to react appropriately to a situation before the situation has even developed fully—by identifying the situation from the initial aspects of it.

It is usual to think of communication as a two way affair: there is someone intending to send a message and someone trying to understand it. An arrangement of flags on a ship's mast is put there intentionally and anyone who understands the code can tell what it means. But a person who knows the code would also be able to pick out a message from a casual arrangement of flags used to decorate a party or a petrol station.

Communication can be a one way business. Dealing with the environment is an example of one way communication. One picks out messages from the environment even though no one has deliberately put them there.

If you offer a random arrangement of lines to a group of people they will soon start to pick out significant patterns. They will be convinced that the patterns have been put there deliberately or that the random arrangements are not random at all but actually constructed out of special patterns. Students who were asked to react in a certain way to a bell which was set off at random intervals soon became convinced that there was a meaningful pattern in the way the bell was sounded.

Communication by code or preset patterns requires the building up of a catalogue of patterns just as you can only use the catalogue number of a book in the library if someone has catalogued the books. As suggested above there does not have to be an actual code number for each pattern. Some part of the pattern itself may come to represent the whole pattern. If you recognized a man by hearing the name 'John Smith' that would be using a code heading, but if you recognized him by the sound of his voice at a party that would be using part of the pattern. Opposite are shown two familiar patterns each of which is partly hidden behind some screen. One would have little difficulty in guessing the patterns from the parts that were accessible.



The mind as a patternmaking system

The mind is a patternmaking system. The information system of the mind acts to create patterns and to recognize them. This behaviour depends on the functional arrangement of the nerve cells of the brain.

The effectiveness of the mind in its one way communication with the environment arises from this ability to create patterns, store them and recognize them. It is possible that a few patterns are built into the mind and these become manifest as instinctual behaviour but this seems relatively unimportant in man as compared to lower animals. The mind can also accept ready made patterns that are fed to it. But the most important property of the system is the ability to create its own patterns. The way the mind actually creates patterns is described elsewhere*.

A system that can create its own patterns and recognize them is capable of efficient communication with the environment. It does not matter whether the patterns are right or wrong so long as they are definite. Since the patterns are always artificial ones created by the mind, it could be said that the function of mind is mistake. Once the patterns have been formed the selecting mechanism of usefulness (fear, hunger, thirst, sex, etc) will sort out the patterns and keep those which are useful for survival. But first the patterns have to be formed. The selecting mechanism can only select patterns; it cannot form them or even alter them.

Self-organizing system

One can think of a secretary actively operating a filing system, of a librarian actively cataloguing books, of a computer actively sorting out information. The mind however does not actively sort out information. The information sorts itself out and organizes itself into patterns. The mind is passive. The mind only provides an opportunity for the information to behave in this way. The mind provides a special environment in which information can become self-organizing. This special environment is a memory surface with special characteristics.

A memory is anything that happens and does not completely un~~happen~~. The result is some trace which is left. The trace may last for a long time or it may only last for a short time. Information that comes into the brain leaves a trace in the altered behaviour of the nerve cells that form the memory surface.

A landscape is a memory surface. The contours of the surface offer an accumulated memory trace of the water that has fallen upon it. The rainfall forms little rivulets which combine into streams and then into rivers. Once the pattern of drainage has been formed then it tends to become ever more permanent since the rain is collected into the drainage channels and tends to make them deeper. It is the rainfall that is doing the sculpting and yet it is the response of the surface to the rainfall that is organizing how the rainfall will do its sculpting.

With a landscape the physical properties of the surface will have a strong effect on the way the rainfall affects the surface. The nature of the surface will determine what sort of river is formed. Outcrops of rock will determine which way the river goes.

Instead of a landscape consider a homogeneous surface onto which the rain falls. A shallow dish of table jelly would provide such a surface. If hot water falls on this jelly surface it dissolves a little bit of the jelly and when the water is poured off a shallow depression is left in the surface. If another spoonful of water is poured onto the surface near the first spoonful it will run into the first depression tending to make this deeper but also leaving some impression of its own. If successive spoonfuls of hot water are poured onto the surface (pouring each one off again as soon as it has cooled) the surface will become sculpted into a jelly landscape of hollows and ridges. The homogeneous jelly has simply provided a memory surface for the spoonfuls of hot water to organize

themselves into a pattern. The contours of the surface are formed by the water but once formed the contours direct where the water will flow. The eventual pattern depends on *where the spoonfuls of water were placed and in what sequence they were placed*. This is equivalent to the nature of the incoming information and the sequence of arrival. The jelly provides an environment for the self-organization of information into patterns.

Limited attention span

A fundamental feature of a passive self-organizing memory system is the limited attention span. This is why only one spoonful of water at a time was poured onto the jelly surface. The mechanics of how a passive memory surface can come to have a limited attention span are explained elsewhere*. The limited attention span means that only part of the memory surface can be activated at any one time. Which part of the surface comes to be activated depends on what is being presented to the surface at the moment, what has been presented to the surface just before, and the state of the surface (i.e. what has happened to the surface in the past).

This limited attention span is extremely important for it means that the activated area will be a single coherent area and this single coherent area will be found in the most easily activated part of the memory surface. (In the jelly model this would mean the deepest hollow.) The most easily activated area or pattern is the most familiar one, the one which has been encountered most often, the one which has left most trace on the memory surface. And because a familiar pattern tends to be used it becomes ever more familiar. In this way the mind builds up that stock of preset patterns which are the basis of code communication.

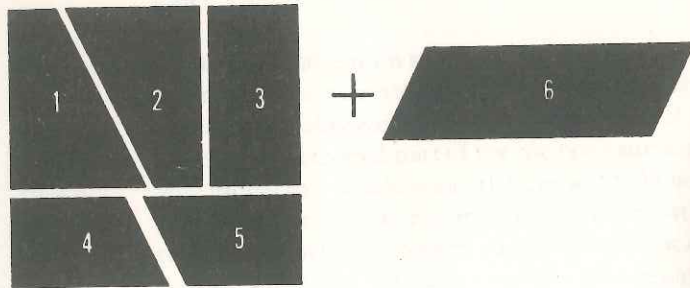
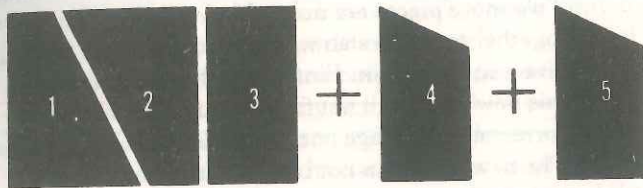
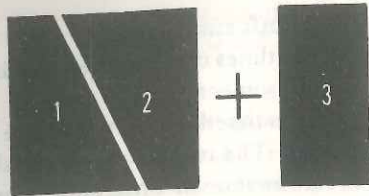
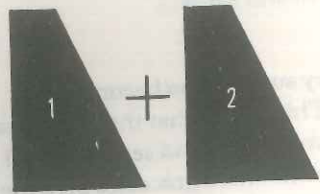
With the limited attention span the passive

self-organizing memory surface also becomes a self-maximizing one. This means that the processes of selection, rejection, combination and separation all become possible. Together these processes give the mind a very powerful computing function*.

Sequence of arrival of information

Overleaf are shown the outlines of two pieces of thin plastic which are given to someone who is then instructed to arrange them together to give a shape that would be easy to describe. The two pieces are usually arranged to give a square as shown. Then another piece of plastic is added with the same instructions as before. This is simply added to the square to give a rectangle. Two more pieces are now added together. They are put together to give a slab which is added to the rectangle to give a square again. Finally another piece is added. But this new piece will not fit. Although one has been correct at each stage one is unable to proceed further. The new piece can not be fitted in to the existing pattern.

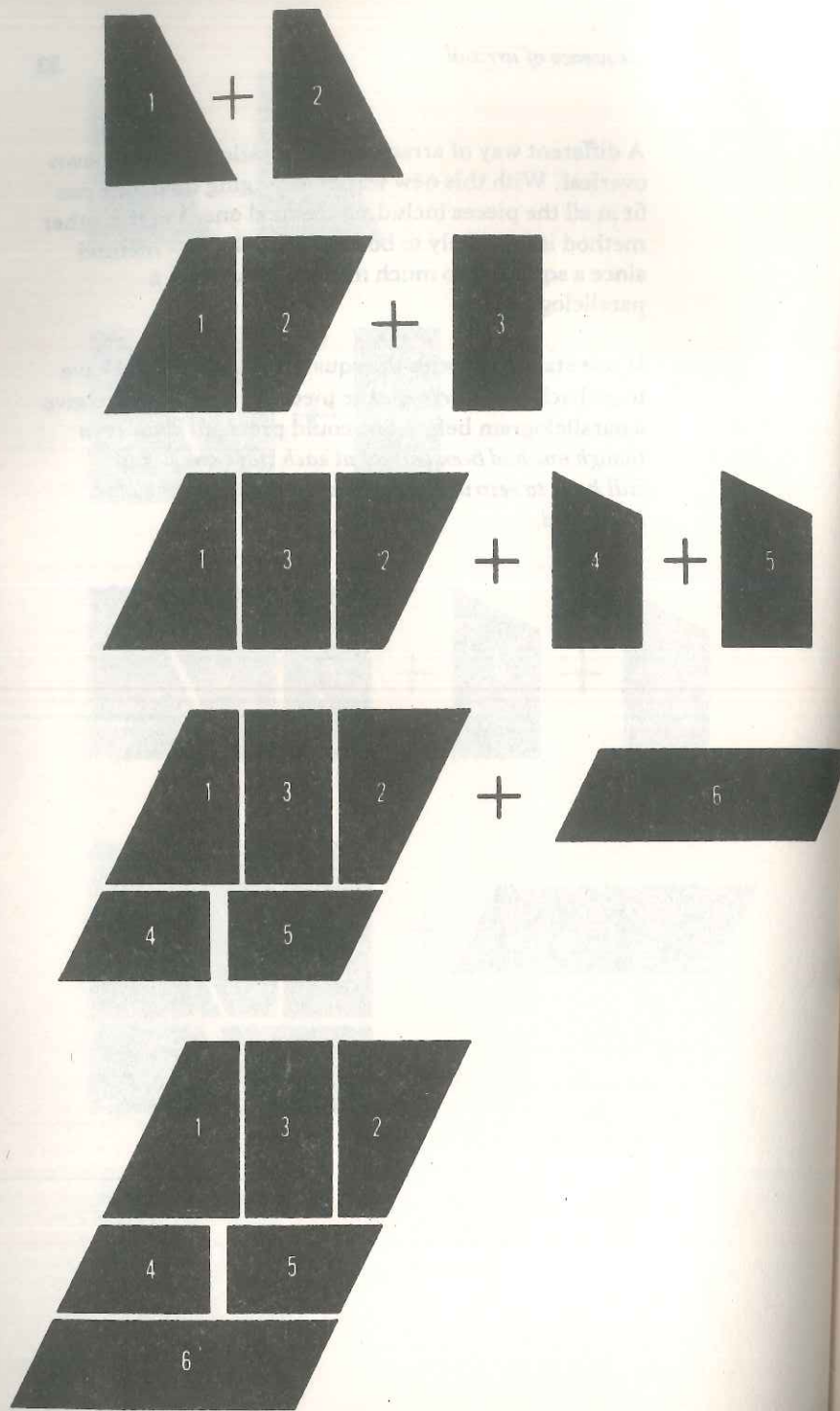




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A different way of arranging the plastic pieces is shown overleaf. With this new way of arranging them one can fit in all the pieces including the final one. Yet this other method is less likely to be tried than the first method since a square is so much more obvious than a parallelogram.

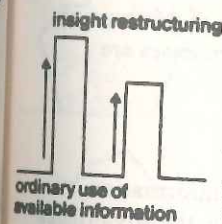
If one started off with the square then one would have to go back and *rearrange* the pieces at some stage to give a parallelogram before one could proceed. *Thus even though one had been correct at each stage one would still have to restructure the situation before being able to proceed.*



The plastic pieces indicate what happens in a self-maximizing system. In such a system information available at any moment is always arranged in the best way (most stable in physiological terms). As more information comes in it is added to the existing arrangement as the plastic pieces were added. But being able to make sense of the information at several stages does not mean that one can go on. There comes a time when one cannot proceed further without restructuring the pattern - without breaking up the old pattern which has been so useful and arranging the old information in a new way.

The trouble with a self-maximizing system that must make sense at each moment is that the sequence of arrival of information determines the way it is to be arranged. For this reason the *arrangement of information is always less than the best possible arrangement* for the best possible arrangement would be quite independent of the sequence of arrival of the pieces of information.

maximum use of available information



In the mind which is a cumulative memory system the arrangement of information as concepts and ideas tends to make less than the maximum use of the information available. This is shown diagrammatically where the usual level of information use is shown well below the theoretical maximum level. It is by insight restructuring that one can move toward the maximal level.

Humour and insight

As with the plastic pieces there is often an alternative way of arranging available information. This means that there can be a switch over to another arrangement. Usually this switch over is sudden*. If the switch over is temporary it gives rise to humour. If the switch over is permanent it gives rise to insight. It is interesting that the reaction to an insight solution is often laughter even

when there is nothing funny about the solution itself.

A man jumped off the top of a skyscraper. As he passed the third floor window he was heard to mutter: 'So far so good'.

Mr Churchill sat down next to Lady Astor at dinner one day. She turned to him and said, 'Mr Churchill, if I was married to you I should put poison in your coffee.' Mr Churchill turned to her and said, 'Madam, if I was married to you . . . I should drink the coffee.'

A policeman was seen walking along the main street pulling a piece of string. Do you know why he was pulling the piece of string? . . . Have you ever tried *pushing* a piece of string?

In each of these situations an expectation is generated by the way the information is put together. Then suddenly this expectation is thwarted but at once one sees that the unexpected development is another way of putting things together.

Humour and insight are characteristic of this type of information handling system. Both processes are difficult to bring about deliberately.

Disadvantages of the system

The advantages of the preset pattern information system have been mentioned. Basically the advantages are quickness of recognition and hence quickness of reaction. Because one can recognize what one is looking for one can also explore the environment efficiently. The disadvantages are just as definite. Some of the disadvantages of the information handling system of mind are listed here.

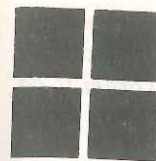
- 1 The patterns tend to become established ever more rigidly since they control attention.
- 2 It is extremely difficult to change patterns once they have become established.

3 Information that is arranged as part of one pattern cannot easily be used as part of a completely different pattern.

4 There is a tendency towards 'centering' which means that anything which has any resemblance to a standard pattern will be perceived as the standard pattern.

5 Patterns can be created by divisions which are more or less arbitrary. What is continuous may be divided into distinct units which then grow further apart. Once such units are formed they become self-perpetuating. The division may continue long after it has ceased to be useful or the division may intrude into areas where it has no usefulness.

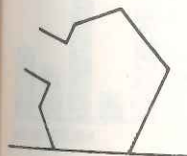
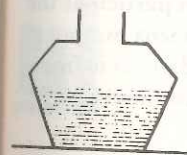
In the diagram opposite if a square is habitually divided into quarters as shown in A it becomes difficult to use the division shown in B.



A



B



6 There is great continuity in the system. A slight divergence at one point can make a huge difference later.

7 The sequence of arrival of information plays too important a part in its arrangement. Any arrangement of information is thus unlikely to be the best possible arrangement of the information that is available.

8 There is a tendency to snap from one pattern to another instead of having a smooth change over. This is like those ink bottles which have two stable positions (see opposite). This snapping change occurs as one switches from one stable pattern to another.

9 Even though the choice between two competing patterns may be very fine one of them will be chosen and the other one completely ignored.

10 There is a marked tendency to 'polarize'. This means moving to either extreme instead of maintaining some balanced point between them.

11 Established patterns get larger and larger. That is to say individual patterns are strung together to give a longer and longer sequence which is so dominant that it

constitutes a pattern on its own. There is nothing in the system which tends to break up such long sequences.

12 The mind is a cliché making and cliché using system.

The purpose of lateral thinking is to overcome these limitations by providing a means for restructuring, for escaping from cliché patterns, for putting information together in new ways to give new ideas. In order to do this lateral thinking makes use of the properties of this type of system. For instance the use of random stimulation could only work in a self-maximizing system. Also disruption and provocation are only of use if the information is then snapped together again to give a new pattern.

Summary

The mind handles information in a characteristic way. This way is very effective and it has huge practical advantages. But it also has limitations. In particular the mind is good at establishing concept patterns but not at restructuring them to bring them up to date. It is from these inherent limitations that the need for lateral thinking arises.

Difference between lateral and vertical thinking

Since most people believe that traditional vertical thinking is the only possible form of effective thinking it is useful to indicate the nature of lateral thinking by showing how it differs from vertical thinking. Some of the most outstanding points of difference are indicated below. So used are we to the habits of vertical thinking that some of these points of difference may seem sacrilegious. It may also seem that in some cases there is contradiction for the sake of contradiction. And yet in the context of the behaviour of a self-maximizing memory system lateral thinking not only makes good sense but is also necessary.

Vertical thinking is selective, lateral thinking is generative

Rightness is what matters in vertical thinking. Richness is what matters in lateral thinking. Vertical thinking selects a pathway by excluding other pathways. Lateral thinking does not select but seeks to open up other pathways. With vertical thinking one selects the most promising approach to a problem, the best way of looking at a situation. With lateral thinking one generates as many alternative approaches as one can. With vertical thinking one may look for different approaches until one finds a promising one. With lateral thinking one goes on generating as many approaches as one can even *after* one has found a promising one. With vertical thinking one is trying to select the best approach but with lateral thinking one is generating different approaches for the sake of generating them.

Vertical thinking moves only if there is a direction in which to move, lateral thinking moves in order to generate a direction

With vertical thinking one moves in a clearly defined direction towards the solution of a problem. One uses some definite approach or some definite technique. With lateral thinking one moves for the sake of moving.

