To increase the efficacy of visual instruction, more must be known about the operational forces within the image, and the determining factors in picture quality as a means of communication. The theory of information applied to this analysis of pictorial content, the fundamental thesis being that the value of an image depends on its content of information. The more a picture needs explanation, the smaller its utilization in the classroom. The principles necessary for smooth comprehension of the picture contents and the organization of picture reality are casualty, parallelism, sequence, interruption, and the principle of conveying the information in the picture to the class. Equally important is the need to define the wanted focus of attention (details of the picture) and the direction of the movement (the overall picture). An understanding of these fundamentals should aid both the artist producing the pictorial images and the foreign language teacher. (DS)
FOREIGN LANGUAGE TEACHING PICTURE AS AN ORGANISED SYSTEM

Eugen Spýlený — Jaroslav Pepník

Une confrontation des principes fondamentaux de la théorie de l'information avec celle de la théorie de l'enseignement des langues étrangères sous forme d'aides visuelles pourra nous dévoiler beaucoup de choses sur le caractère à donner à une image destinée à être utilisée dans un enseignement de langues. L'application de certains termes techniques fondamentaux, comme information, récepteur, source, bruit, redondance n'est pas une tentative de remplacer les vieux termes par de nouveaux. La nouvelle terminologie sera un moyen d'arriver à une meilleure connaissance de la fonction des images comme moyen de communication. L'article essaie de déterminer les conditions nécessaires pour qu'une image fonctionne dans l'enseignement.

La thèse fondamentale est la suivante: la valeur d'une image dépend de son contenu d'information. L'information se définit par le degré de non-ambiguïté, c'est-à-dire par le degré d'ordre et d'organisation de la réalité à l'intérieur de l'image. La manière dont on doit organiser la réalité dépend de but de l'enseignement.

L'article pose les principes suivants: le principe d'organisation de la réalité, le principe de causalité, le principe de parallélisme, le principe de séquence et le principe de l'interruption. Les auteurs soulignent aussi la nécessité de respecter le domaine de l'attention et la direction du mouvement et aussi de contrôler la redondance de l'image. Ils hésitent d'accepter la méthode de l'école française audiovisuelle qui commence par un courant de mots français parlés et une projection simultanée d'images.

On conclut que personne ne semble avoir bien compris jusqu'ici quel est le facteur qui détermine la qualité d'une image comme moyen de communication. Si nous ne savons pas davantage sur les forces qui agissent à l'intérieur même d'une image, nous n'arriverons pas à augmenter son efficacité en tant que moyen d'enseignement visuel. L'analyse proposée des éléments constitutifs du contenu d'une image, ainsi que les termes suggérés — en partie en conformité avec ceux de la théorie de l'information — susceptibles de servir d'instrument dans une telle analyse, pourraient être utiles au même titre pour l'artiste engagé dans la production des images et pour le professeur de langues étrangères.

Ein Vergleich zwischen den Grundprinzipien der Informationstheorie und denen des visuellen Sprachunterrichts kann uns vieles über den wünschenswerten Charakter eines Unterrichtsbildes offenbaren. Die Verwendung gewisser technischer Termini wie Information, Empfänger, Quelle, Geräusch, Redundanz ist nicht als ein Versuch anzusehen, die alten Termini durch neue zu ersetzen. Die neue Terminologie wird ein Mittel sein, die Funktion der Bilder als Kommunikationsmittel besser zu kennen. Der vorliegende Artikel versucht die Bedingungen...
1.0 Definition of a FLT picture by the Degree of Information of its Content

We are of the opinion that a confrontation of fundamental terms of the theory of information with those of the theory of foreign language teaching (FLT) as practised with visual aids can reveal much about the character of a FLT picture and its place in FL teaching. The application of certain fundamental technical terms as information, receiver, source, noise, redundancy, is not an attempt to put the older terms such as content, pupil, teacher, incomprehension, superfluous element, into new clothing. The new terminology is to serve as a tool with which we could get a better insight into what a FLT picture is, how it functions as a medium of communication. This paper attempts to find out the conditions under which a FLT picture functions. Further research leading to some statistical conclusions is intended to acquire additional support for the present findings.

Our basic thesis is: the value of a FLT picture consists of its information content. The information conveyed by means of the picture can be defined as the degree of unambiguity, in other words, as the degree of order and organization (patterning) of the reality within the picture. The manner of this organization of the visual reality depends on the object of our teaching, our teaching goal.
Each section of reality transmits certain semantic information. Information communicated by means of the picture is from the very beginning limited by the teaching goal of each particular lesson, which means, it is restricted as to the extent of the vocabulary and the selection of grammatical patterns. These limitations must not be understood as a strict boundary between what may and what must not be done in the lesson. They should rather be interpreted as the range between the minimum and the maximum requirements. It is given by the organization of the portrayed reality, which concept includes besides selection of elements also various principles of arrangement of these elements as well as various principles of their pictorial presentation.

The information theory differentiates between the so-called semantic information and the selective information. Since the former is conceived as information in general, and the latter as information originating from a comparison between two selected situations, it is evident that the term information is used in this study in this second sense. We are not concerned with the picture in general: we attempt to establish whether the information contained in one experimental picture is larger than the information in another picture on the same subject. To measure the unavailability of information the term entropy is used. Entropy is zero if the probability of one of the phenomena is one (the probability of all the other phenomena being necessarily zero).

What use can be found for the concept of probability in an analysis of a picture as a tool conveying the meaning of some reality? As the term entropy can be applied on the level of graphemes, phonemes, morphemes and words, it can similarly be introduced on the level of elements of an organized reality. The number of graphemes in a language is final and so is the number of elements in a picture: this number is defined by the teaching goal of the particular lesson, i.e., the extent of the vocabulary and the grammatical patterns to be mastered by means of this particular picture. Thus we can examine the size of a piece of information which is conveyed by a sequence of pictorial elements. Let us take the following sequence: to SLIP – to FALL – to GET UP. The probability of the phenomenon FALL is one, the probability of such phenomena as FALL ASLEEP, GREET, COMB ONESelf, etc., is zero. In the sequence to FALL – to GET UP the information value of GET UP is larger than zero because there is an alternative: the person is not going to get up after having fallen down – he may have been injured and consequently is now unable to get up from the ground. The picture to be used in FL teaching evidently must not have maximum entropy because, if the pupil—the receiver of the report evaluated all following elements as equally probable, the picture would not be able to make him talk, the reality would not be organized enough. The implications regarding pedagogics are obvious: the more the content of a picture needs some explanation, the smaller its utilization in the classroom.
2.0 Principles of organization of the reality

Which principles underly the organization in the picture, thus contributing to the amount of information coming out from the picture, or to word it in traditional terms, which principles are necessary for smooth comprehension of the contents of the picture? In our opinion, the most basic principles are the following:

2.1 The principle of causality

By this principle is meant the relation between phenomena which necessarily result from each other (as cause and effect, or consequence). As shown by experience, the more elements of reality are interrelated with each other, the more easily they can be memorized. On the other hand, when the elements comprising the picture are not interrelated, they are often hardly noticed. With the picture the teacher tries to make the pupil speak as much as possible. Now the important matter is not only to make the picture packed with facts, with information, but, which is no less important, to prevent the pupil from interpreting the events in the picture in a haphazard way. The pupil must read—interpret the events only in such a way that he does not need have recourse to anything beyond the language material made available for his lesson by the teacher (or the material mastered in previous lessons).

The door in the picture is shut (Fig. 1). If this is presented as an isolated phenomenon, it will not stimulate any other response beyond a descriptive statement "the door is shut". But if there is a notice "Shut the door" (Fig. 2), attached to the open door, the fact of being open ceases to be an accidental element and stimulates a language response with a negation ("the people do not shut the door", "the people don't read notices", "the people don't pay attention..."
enough", "the people don’t obey instructions"). And if a person appears in this
door, someone who has passed through the door (Fig. 3) and has left it open,
this person can be requested by the pupil to obey the instruction; the pupil is
forced to use phrases like "Will you close the door, please", or, "Read that
notice on the door, will you?", or, "Mr. X, don’t leave the door open, please."—
The picture of a crash should give a clue as to the cause of the crash (Fig. 4, 5).

2.2 The Principle of Parallelism

This principle reinforces the principle of causality. The substance of par-
allelism is:

2.21 positive comparison: a certain phenomenon appears in the picture twice—for
the second time as a variant: for instance, there is a pedestrian and a motor
vehicle entering the crossroads when the red light is on (Fig. 6). The fact we
wish to convey, the lack of discipline, is thus more apparent than if there were
only one example of the breach of traffic regulations.
2.22 negative or contrastive comparison: Let us take an example from the picture of a Restaurant. When we wish to have there clearly expressed the fact of a person leaving without paying, a person paying the bill (Fig. 7) should be in the same picture as well. Referring to these contrasting items we can exclude various accidental interpretations as for instance that the particular person is leaving for the cloakroom or that he has sighted a friend at another table.

2.3 The Principle of Sequence

Similarly as a simple geometrical formation can be defined by two points, a simple information can be defined by two elements: the cause and the result (when the principle of causality is in operation) or by two parallel phenomena (the principle of parallelism). A more complex geometrical formation, the circle, requires three points for its definition, and, on analogy, a more complex information is better communicable when there is a sequence of at least three elements. They are either cause—effect—cause (—effect— etc.), or three actions following each other in time, or three or more parallel phenomena. An example of the cause—effect patterns: Since it is hot (the glowing sun in the picture), a person is perspiring. Since he is perspiring he is wiping his face with a handkerchief. Since he is perspiring he has a glass of water (Fig. 8).

2.4 The Principle of the Break

On the one hand we produce the organization of the picture by inserting various types of relationships between the respective phenomena (causality, parallelism, sequence), on the other hand we disrupt to a certain extent this
organization by introducing a break, a pause, between two interrelated phenomena. This break arises by our omitting certain internal links or stages or by failing to make the parallelism complete. The aim of this procedure is to prevent the student falling into the trap of mechanical description and to make him think over each picture. The break is meant as a moment of surprise: the break, to put it in information theory terms, decreases the probability of the pictured event and thereby increases the value of information. A marked example can be provided by producing a serialized little story, a film strip to one compact subject: we disagree with the conception that demands that a filmstrip should comprise as many as 30 pictures. We believe it is necessary to present only the key moments which make the story move forward.

The advocates of long series of slides or long filmstrips refer to the principle of small successive steps, which features prominently in the theory of programmed teaching. However, in our opinion this principle can be applied only in the cases when foreign language structures are taught by means of a hierarchy of sentence patterns. The principle is rather out of place in pictures which are reflexions of reality. Unlike in programmed teaching the pauses between individual steps fulfil their function best when they are longer. A picture presenting a rather complex situation not only contains a larger amount of information than a mere addition of the single scenes into which this picture could be broken up, it also contains a certain amount of breaks stimulating the pupil's imagination. In a serial consisting of subject matter cut up into a great number of small steps the pupil has an impression of being too much led by the hand. There is nothing left for him to discover in the picture, whereas in the case of a comprehensive picture the pupil feels like an explorer, although, as a matter of fact, there is nothing for him to discover that had not been put there by the author of the picture.

3.0  *The Principles of Conveying the Information from the Picture on to the Class*

The role of the teacher begins by the teacher's authorship of the picture, however indirect the authorship may be. The relation between the teacher and the artist is that of a mutual give-and-take, but the teacher must have the upper hand. The teacher's function could be characterized as active participation in the final version of the order and organisation within the picture. He is entitled to assume this function on account of his previous teaching experience with this picture.

The "reading" of the picture with its organized integration of various sequences of elements should become a stereotype in the good sense of the word, as for instance reading and writing has developed into a stereotype. The sequence of elements assumes an important function in these activities, one element activating another or the whole complex of them, which is favourably
reflected in the ease and speed of our reading and writing. To prevent the stereotype of picture reading from becoming an extreme, i.e., a thoughtless activity, the teacher must regulate its development: as need be, he must either reinforce the stereotype, or, with impending danger of the stereotype degenerating into mechanism, the stereotype must be broken up.

In this regulating work of the teacher the following general principles can be established:

3.1 Beginning with Global View

When we are describing the picture of a railway station we should not start with the description of the nearest or farthest end of the picture with all its details but we should put the station first into a time and space context which would enable us to establish a more personal relation with the station in question. Exploiting the principle of topicality the teacher will remind his pupils that the crowding of the station is due to the holidaymakers returning home, or, reversely, that these passengers are people leaving for their holidays, or, that the crowding on the platforms is an outcome of mass excursions to such and such exposition held at the moment in our capital. There can be many explanations of this sort, but the best is of course the one which is closest to the personal experience of the pupils.

3.2 Unchangeability of the Procedures

It takes some time (the mastering of three pictures at least) before the pupil penetrates into the method of the teacher’s guidance along the story of the picture. A replacement of certain procedures by others tends to confuse the pupil and decreases the efficiency of the teaching process because part of the time reserved for conversation gets lost: the pupil takes a longer time to assemble his answer, and, besides, he turns to a more primitive version whenever in doubt what is required of him.

Which procedures are they? There is no universal recipe valid for all conversational topics, but the following principles should be respected:

3.21 The Principle of Shifting Function

The function is given by the language program of the picture. Let us take the situation on the platform of a railway station: there is a man and a woman they are gazing in the direction from which the train is apparently arriving. This is one semantic element of this situation, the other being the child of the couple seated on a suitcase. Which of these two elements will receive a function in the
language class, that is, which of them will play the key role, will depend on the language program of this lesson.

Program A: the train is pulling into the station, the passengers waiting on the platform can see it coming and are getting their luggage ready to get on the train as soon as it stops—for all this the first element, i.e., the two adults, is functional, while the child sitting on a suitcase is merely an additional illustrative element.

Program B: the train is overdue, the passengers are tired, sick of waiting, they are on constant lookout for the train, but it is no good—and how the second element (the child) takes on the main function, and the adults can be introduced into the action only because of the existence of the first semantic element. Only thus will the situation be interpreted as the teacher wants it to, namely, that the adults are looking to the left not because they can see the train coming: they are just waiting impatiently for it, and without any result so far.

3.2.2 The Principle of Respecting the Field of Attention

The field of attention is conditioned by the physiological function of the human eye: the eye interprets the amorphous reality as a structure. When observing a picture of, let us say, the living-room, we roam about the picture with our eyes and take in the individual elements of this composition. Those elements which we compose into a structure stand out more clearly against the background of the unstructured rest—the vague background. When teaching with the aid of picture, it is the teacher who shows the pupil round the individual sections and elements. It is important that the picture composition should give the possibility of directing the observation so that the structure built into this picture is noticed by the pupil as soon as possible. To achieve this, the teacher must not skip from one key element to another, as a matter of fact he must not pass to anything else until the whole sphere of each element has been exploited.

3.23 The Principle of Respecting the Direction of the Movement

By movement we do not mean a tour round the picture. Respecting the direction of the movement means keeping the sequence complete, that is, it is not enough to say. "The cause A (e.g. blazing sun) had the result B" (making the foreign visitor sick)—if the picture also presents that B (i.e. sickness) had C (lack of interest in sightseeing) as a result: it is necessary to conclude the whole of this sequence—it will not do to come back to the last part later. The principle also means exploitation of all instances or possibilities of the parallelism, which were inserted into the picture. And, at long last, it also means preserving a certain level of style in which we had begun.
3.3 The Control of the Redundancy of the Picture

Each picture should contain certain redundant elements to be comprehensible to intermediate and less talented pupils (for the gifted pupils a drawing consisting of hints would be enough to launch conversation) and to provide material for revision lessons. Redundancy in the graphemic system makes itself felt in such a way that the sequence of graphemes is decipherable even if the sequence is to a certain extent incomplete. Let us now transfer this concept into the theory of the foreign language picture. It might, for instance, be sufficient to illustrate the fact of a car having a puncture by a picture of a flat tyre (Fig. 9). But the pupil may not notice that there is something wrong with the wheel. A punctured tyre in itself is a rather inconspicuous detail and some pictorial reinforcement is necessary in this case. This can be done by making the driver kneel on the ground at the wheel and examine the wheel (Fig. 10). This driver is a redundant element reinforcing the basic meaning found in the other element (the tyre). This means that it is for the teacher to decide according to objective circumstances (the standard of the class, time reserves, degree of grammatical knowledge, difficulty or frequency of the vocabulary) whether he should introduce the redundant element or not.

3.4 Control of the Psychological Stress

By the term "stress" or "increased tension" we mean the surpassing of a certain threshold on account of the higher intensity of the contents. We believe that the work with a FL picture as outlined here means an increased tension for the pupil in the first few lessons. The excessive strain arises because the pupil starts with something quite new, new in subject matter as well as in method (i.e. it is not his mother tongue and it is not a traditional school lesson). But with increasing experience the tension diminishes, and finally the time comes when some artificial introduction of a strain in one form or another is desirable be-
cause the obstacles stimulate the brain activity, and the selfdiscovered and self-appropriated learning is the best. To sum up—we hesitate to accept the devise of the French audio-visual school which starts a course by a flood of spoken French with simultaneous projection of pictures, without the teacher’s recourse to the mother tongue.

3.5 Reduction of Disturbances

By disturbance we mean any loss of meaning on the way from the source of information, i.e. the author of the picture (the teacher-librettist and the artist-designer merged into one) to a particular teacher-user of the picture and the pupil who is being taught by means of this picture. Both these two latter persons are receivers of information. The fact that the pupil is “harder of hearing” than the teacher is irrelevant. The fact remains that on the way from the authors of the picture something gets lost from the information inserted into the picture, and is replaced by some other elements of information.

Some degree of disturbance (or “noise”) had occurred already during the cooperation of the designer with the script-writer, in spite of the fact that they may have had a number of sessions over the picture; as a matter of fact, this type of cooperation is unfortunately all too rare, more often the script is simply handed over to reviewers, who make certain changes in it without getting into contact with the script-writer; neither of them meets the artist, who is found by the publishing-house. But it is not the teacher’s affair to bother with this stage in “the life” of a FL picture. From the teacher’s point of view the picture is a finished product. It is up to the teacher now to see what he can get out of the picture. He must do his best to send the meaning of the picture (as he understands it himself) to his pupils with as little loss of meaning as possible; in short, he must endeavour to reduce the degree of disturbance (noise) in his communication. It is natural that more shifts in meaning are apt to occur when mental activities are handled in the picture than when physical surroundings are described.

3.5.1 Disturbance Due to Omission of Essential Features. It originates during the interpretation of a certain phenomenon in the picture; e.g. in the picture “In a physician’s waiting-room” a person is holding his hands on his stomach. If this detail escapes the attention of the teacher or the pupil in the classroom, the pupil will never get to the stomach-ache. He can comment on the patient as suffering from scientica (he is sitting slightly bent, there is uneasiness in his face)—but this comment is the product of the pupil’s imagination, not a reflection of the information conveyed by the picture. In the former case it means that the picture was merely used as an “association picture”, a picture meant to call up the scene of all sorts of illnesses to be found among patients in a doctor’s waiting-room.
3.52 Disturbance Due to Excess of Redundant Elements. Some of the elements can be interpreted by the pupil as non-redundant, as substantial for the general meaning of the picture. If there is a road with a busy traffic in a picture of an autumn landscape, then during the interpretation of the scene the traffic comes to outweigh the aspects of the season of the year, because traffic is a dynamic element, while the landscape is static. If we choose the picture of Piccadilly Circus to represent an English street, the characteristic features of this unique place (neon advertisements, the round-about of the traffic, the monument in the middle) are bound to push the features of the everyday life in an English street into the background (features represented e.g. by verbs "to hurry, to stroll, to shopwindow, to do some shopping, to come across a person, to say Hallo to a friend, to knock into a person, to wind one's way through the crowd, to push through a crowd, to cross the street, to hail a taxi", etc.)

3.53 Disturbance Due to Replacement of One Essential Feature by Another from a Different Level of Meaning. For instance, in the film-strip from St. Cloud one frame is to present the idea "Claudine is a student at the Sorbonne University". What the picture does show, however, is a girl against the background of a busy street, i.e., it suggests the idea "Claudine is a young pretty Parisienne". The street background has added a substantial element to the description of the character (she is living in Paris) but from the point of view of the information this picture is to convey (Claudine is a student) it is so far an unnecessary element. And it is also superfluous from the point of view of grammatical patterns to be taught at the moment.

3.6 Exploitation of Inner Redundancy

The last function of a teacher is to make use of the so-called inner redundancy. The receiver of the report has some experience of his own and into this frame the newly received report is then set. This problem was touched upon in 3.1, when speaking of the global view as a proper way of how to begin. The teacher cannot, however, be content with merely setting the scene of the picture into the wider context of the pupil's personal experience, he must connect every single piece of this new information with the pupil's life experience.

That is why in order to achieve automation in speaking habits we make use of pictures with such familiar environments as the street, the college-dining-hall, the common-room, the railway station, the doctor's waiting-room. In foreign language lessons for students of technical subjects the principle of parallelism between the general and the specific has been resorted to. For instance, in Lesson One for students of natural sciences the relations in space are drilled in a picture of a living-room and then with a picture of a laboratory (or the picture of a ward in the case of medical students) and this is followed by a parallel training on the
material of a technical text: in Lesson One the structure of a cell or of the tissue would be relevant.

This inner redundancy changes and develops with the learner’s age. For an adult person we must choose some well-known reality which can be put into such sentence patterns that have an immediate communicative value for the adult learner. The goal of an adult average person is to make himself understood in various situations of the common life. For children we also select the kind of reality which is familiar to them and which dominates their mental world. Not everything which may seem attractive in a picture to an adult need turn out to be equally attractive to a child. The picture of the type “this apple is red, that pear is yellow”, or, “There is a schoolbag on the desk, There are two schoolbags on the desk”, fails to captivate the child’s imagination and is therefore less successful in the class than a picture with the so-called “luxury vocabulary” (it was Oscar Wilde who wisely said that for modern man only unnecessary things are real necessities). Thus in preschool age language patterns should be drilled on toys and characters from fairy-tales and adventure stories. A child of six learns quicker to make a distinction between the singular and the plural on a picture of a three-headed dragon, and a child of ten on a picture of three Red Indians attacking one backwoodsman, than on an illustration of one schoolbag or toothbrush or apple as against any three of them.

4.0 Conclusion

So far it has not been very well understood what makes one picture better than another for the purpose of foreign language teaching. Unless we know more about the forces at work inside a picture, we cannot increase the efficiency of teaching based on visual aids. The present paper attempts to analyse constituent elements of the organization of the pictorial content, and suggests several terms—some of them on close parallel with terms from the theory of information—which could serve as tools in this analysis. These partial findings could be of use both to the artist engaged on the job of language-teaching pictures and to the language teacher himself.

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