

UNDERSTANDING WRITING AS AN APPROACH TO READINGCOMPREHENSION

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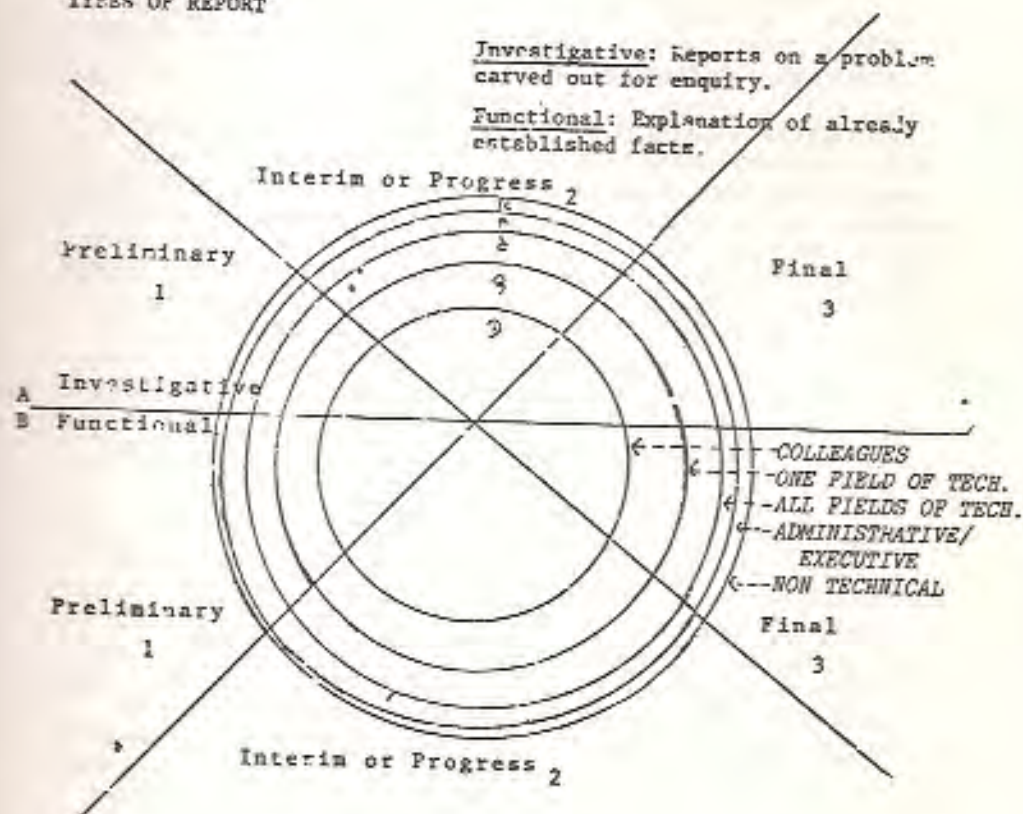
As teachers of English as a foreign language or second language we appreciate the fact that although many students master the elementary stages of reading skills, which are generally taken to be recognition and structure of words and sentences, they are frequently not taught to develop the skills required to read long stretches of continuous text. This skill, called the skill of interpretation may be described as the ability to recreate the entire message of the writer in some way other than by simple repetition.

The purpose of this paper will be to suggest that, for teachers of English for science and technology, insights can be obtained by focusing on the writer, the way in which he organizes and transmits information and the kind of language he selects, rather than by focusing on the reader and the text as seen purely from the reader's point of view. Given that we are concerned in this paper with texts relating to science and technology, it is not unreasonable to assume that an examination of an instructional manual on the technique of scientific writing will provide us with insights into some of the problems which confront a writer writing for a given readership. From these insights we may be provided with ideas which can be of help to us in the development of teaching materials for reading instruction. (Mackay and Mountford 1974.)

In the reader - writer relationship, the writer is the predominant figure. He produces, the reader receives. He makes the choices about the information to be included and he controls the way in which it is presented. The kind and amount of detail the writer presents depends on the type of audience he is writing for. For example the kind of report a technical or scientific writer produces, is determined by three basic considerations; the nature of the information to be reported, the scope of the information to be reported, and the readers to which the information is to be reported. These considerations are not unrelated. (Marder, 1960) Selinker, Trimble, and Lackstrom (ref.) (E. T. Forum) maintain that many of the decisions made by writers are made on the basis of presuppositions regarding the amount of information the writer believes the reader will bring to the material.

The readership of technical literature can be divided into two groups, the technical and non/technical readership. The technical readership includes four broad categories; administrators and executives, readers in all fields of science and engineering, readers in one field of science and engineering, and supervisors and other colleagues. The non/technical readership is made up of people who are not employed in fields of technology and read technical information. The interests of non/technical readers are too varied for useful classification. In such cases, the writer assumes that the reader is reading for personal profit. Because the background and particular interest cannot be determined, communication with the non-technical audience usually requires writing techniques that are greater than average. (Marder, 1969). Thus, in this paper, our perspective will be an interactional one, writer-reader, to study the discovery procedures used by communicators. (Jacobovits and Gordon, 1974).

#### TYPES OF REPORT



(from Daniel MARDER: *The Craft of Technical Writing*, Macmillan, N.Y., 1960).

As Diagram 1 shows the writer is constantly forced to consider the reader while he is writing, and to facilitate his reading by predicting and eliminating possible points of difficulty. In "The Craft of Technical Writing" Marder points out that scientific writers follow precise organization principles when presenting information in order that their written exposition will reflect the procedures of enquiry used by the science or technology which they are reporting. It is important to point out at this stage that the structure of science as knowledge is not our direct concern; what is our concern is the communicative methodology of science. (Mountford, 1975) What we have just called the communicative methodology is a collection of expository techniques which the writer employs in order to render his information into a written form which is accessible to the readership he has in mind. Once this communicative methodology has been identified we can use it to examine texts more closely in order to teach students the principles upon which the information has been organized.

Again, I repeat it is not unlikely that the communicative methodology used by scientific and technical writers will be explained in writing manuals which purport to teach scientist and technician how to communicate in writing. The expository techniques used to illustrate this approach to writing as proposed by Marder, (a professional technical writer) are the following: Definition, Classification, Analysis, Description, Narration (technical) and Illustration. All of these expository techniques can be broken down into sub-categories. For our purposes we will concern ourselves with these major headings.

By offering this list we are not implying that these are the only possible techniques used for the organization of scientific writing nor that these expository techniques are characteristic of scientific writing alone. Indeed it would appear that authors employ different expository techniques and combinations of expository techniques in order to communicate their information in writing. (Cao-Romero, 1976) Nevertheless, we will make use of Marder's inventory in this paper since we feel that it is the most thorough and professionally informal detailed account of the organization of information that we encountered.

Let us look at these expository techniques and observe how they correspond to specific questions asked by scientists and technicians in the course of their professional work.

#### 1. Definition

What is it?

- |                          |   |
|--------------------------|---|
| 2. Classification        | Where does it belong? In what group with what other items.                  |
| 3. Analysis              | How is it put together? What are its component parts?                       |
| 4. Description           | What is it like? What are its characteristics.                              |
| 5. Narration (Technical) | What happens? i. e. in a series of related activities, processes or events. |
| 6. Illustration          | What is its appearance?   |

According to Marder, "The Writer Introduces his subject and tells what his purpose is in speaking about it. Then he develops that purpose by showing what has happened to the subject and what facts about it he has to offer. He concludes by drawing generalizations from the facts and applying them to the original purpose." The organizational principles which guide the writer in this task of presenting information in the most appropriate way are the principles of rhetoric, the fundamentals of organizing any form of written communication. Let us look at these principles which writers like Marder mention. These are:

- 1) Unity that is the relation of materials to the subject.
- 2) Coherence, the manner of relating, or organizing the material to give a continuous development of the subject, without coherence there will be no unity.
- 3) Emphasis which means giving the correct relative weight to each element of discourse.

We must examine their importance in the teaching and learning situation we often confront in the classroom.

Both the principles of rhetoric and the expository techniques employed by the technical writer can serve as guidelines for the teacher trying to teach reading comprehension. However, they are to some extent inadequate from the teacher's point of view, in the sense that they do not provide us with a description of the language realization of the exposition techniques. That is to say on the one hand we are presented with the writer's point of view which is a concern for communicating scientific information through the principles of rhetoric and expository techniques. While these are fairly expli-

cit, their application is a matter of intuition. No specific instructions as to the actual language use is given. This is not surprising since Marder is writing for native speakers. He assumes that what he has to teach is not the language itself but the principles which permit the reader to organize the language, which they already know, in the service of scientific communication.

There is on the other hand, the applied linguists point of view which is to some extent a concern with description. That is to say the applied linguist who has non-native speakers in mind is concerned with the linguistic realization of the expository techniques themselves not only with these techniques as instruments of organization of information. He needs to know the specific code features lexical, grammatical and structural which formally make a stretch of text a definition, or a classification, etc. He needs to know this in order to be able to provide the teacher with instructional materials. We as teachers need more adequate descriptions of language which lend themselves to application in the TESOL classroom and hence, the pertinence of the applied linguist's concern with precise language description of these expository techniques.

Nevertheless, these resulting linguistic descriptions may also be inappropriate for immediate application for teachers who possess little linguistic knowledge. The descriptions may consist of little more than numbers or involve linguistic terminology with which the TESOL teacher may not be familiar with. What we as teachers are looking for in focusing our attention on the writer and the way in which he conveys his message are specific clues that enable us to teach the way language functions in order to realize the necessary expository acts.

In order to be able to do this, we must undertake a closer analysis of relevant text, and the specific features and functions of the language that must be identified and categorized to make our teaching material successful for student learning. We must describe how sentences in combination interact with one another and develop some operational framework which will enable us to define more clearly how each section of a text can be accounted for in communicative terms. We should point out that one linguistic form may fulfill a variety of expository techniques, and equally one communicative function may be fulfilled by a variety of linguistic forms.

Ex.

Def. A barometer is an instrument which measures atmospheric pressure.

Gen. A barometer measures atmospheric pressure.

English In Focus - Physical Science  
Allen - Widdowson

See. When the liquid reaches 100° it must be removed to a second tube.

Conclusion. This specimen has six legs, therefore it must be an insect.

- Different structures realizing the same function
- We must always use a file with a handle on the tang
- A file must always be used with a handle on the tang

English In Focus - Workshop Practice  
A. Mountford - Oxford

The engine, unlike the earlier one, has six cylinders.  
This engine as against the 4 cylinders of the earlier one has 4 cylinders.

We cannot simply substitute one form for another form without taking into consideration how the information carried by any particular sentence relates to the co-text, that is, the text of which it forms an integral part.

The Structure of Technical  
A. J. Herbert - Longman

Before we begin this description we wish to make it clear that we are considering the paragraph as the basic rhetorical unit in the writing of English for science and Technology, as it has been described by Selinker, Trimble, Lackstrom (Forum, P. and Marder) himself. We shall define it as a unit of discourse that presents a selected amount of information on a given subject for a given purpose. Now having said that, we will examine the aspects of cohesion within a paragraph, this will lead to the examination of cohesion between paragraphs. It has already been stated by Bormuth that a knowledge of textual cohesion is something we ought to teach our students in order to improve students' reading comprehension abilities. By a knowledge of textual cohesion we mean relation both between and within sentences.

Example of cohesion:

DDT is a man-made organic chemical released into the environment as a pesticide at a rate of about 100,000 tons annually. After its application by spraying, part of it evaporates and is carried long distances in the air before it eventually precipitates back into the land or in the ocean. In the ocean some of the DDT is taken up by plankton, some of the plankton are eaten by fish, and

some of the fish are finally eaten by man. At each step in the process the DDT may be degraded into harmless substances, it may be released back into the ocean, or it may be concentrated in the tissues of living organisms. There is some time delay involved at each of these steps.

The Limits to Growth  
Donella H. Meadows et. al.

The features of cohesion include the features of equivalence, or co-referentiality, of lexical items and of pronominal expression; connection, or the system of adjunction and conjunction by which the sentences cohere; and thematization, the ordering of information within and between sentences so as to provide an orderly flow of given and new information in the text as a whole. (Halliday, 1970) We can then say that cohesion devices include all the characteristics of a text as distinct from an unrelated collection of sentences.

Let us now move on to another principle of rhetoric which is emphasis. Emphasis enables the writer to shape his sentences for conveying the author's thought. Misplaced emphasis can distort the focus of information in the sentence, which can lead to a misinterpretation in the reading, which in turn can lead to complete confusion on the part of the reader. A technical writer, who wishes to remain objective need not resort to the use of the passive voice. It is frequently said that recurrent use of the passive in scientific literature is a result of the scientist's desire to remain objective. This is an inadequate explanation. A more adequate one would be to point out that a passive construction permits the focus of information to fall on one element of the sentence rather than on another; and it is the need to emphasize certain pieces of information rather than others which leads to the frequent use of the passive voice. For example we can say, "We heated the liquid in a test tube". The emphasis is on we. Or can say "the liquid was heated in a test tube", the emphasis is on liquid. Voice is used in the service of emphasis not because a certain type of writing demands the use of a particular voice but because the flow of information demands that the focus of information be upon one word or phrase than another. Hence, we can say it is emphasis not voice which affects the appropriateness of the writing.

At this point we must indicate how all of this can contribute to the teaching of reading comprehension in English for science and technology, that is to say the level of ability which permits the student to use the language as an auxiliary skill in his academic studies. We believe:

- (1) Better and more detailed description permits the possibility of better and more informed teaching materials.
- (2) More aware teachers result in better informed students.

Making the students aware of the expository techniques used by the scientific writer and providing him with precise information on all points which are important and then exercising this knowledge is far more effective than having the teacher ask questions such as, "Can't you see where the emphasis lies? Why do you think it's coherent". What we must do is increase the student's functional knowledge of the language. This functional knowledge of how language works is an important component of advanced reading comprehension ability.

What we have suggested here is not a methodology in itself, it is simply a way of approaching the problem. We feel that there is a great deal that can be done. Examination of reading materials is important because part of what is communicated is the way in which it is communicated (Mountford, 1975). If science is concerned largely with description and explanation, the methodology of such description is reflected in the language use associated with these. A course synthesis of the type suggested here, focusing on the written message and how it is conveyed could probably be exploited by the English Language teacher in achieving specific reading comprehension goals in the reading for science and technology. Relying too much on student intuition or the fact that a student who reads and understands scientific and technical books in his own language will be able to do so in English is a rather naive approach on the teacher's part. Logic which is the basis of rhetoric, is evolved out of a culture; it is not universal. Rhetoric, is not universal either, but varies from culture to culture and from time to time within a given culture. (Kaplan) Our concern as E. S. T. teachers is not to contrast the language uses related to two different cultures but to contrast the ways in which language is employed to communicate information in reader-writer situations with different characteristics eg. scientist-general public, scientist-peer group.



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