
Interdisciplinary Synthesis in Science and Communication

MAIZIE FOISTER, Okmulgee High School, Okmulgee

The world of today is a world of science. The world of tomorrow, if there be one, must be a world of communication. Science has made the choice possible; communication must make the choice probable.

Are these two disciplines so widely separated that they must continue on divergent paths to reach the same goal? A cursory glance may indicate that they may be, yet closer examination will reveal many common characteristics.

Both science and communication are concerned with the accurate and truthful presentation of facts. Both are systematic, both are concerned with the concrete and the abstract, with the development of general statements and laws, and with the formulation of hypotheses and theories. Science is wary of unsupported opinions and judgments; communications must be particularly aware of the semantical aspects of values reported in this manner. The assumptions arising from untested hypotheses may provide the germinal ideas for scientific advancement; couched in emotive terms, such assumptions are frequently the cause of failure in the communication process.

Science and communication share a common progenitor. The works of Ray, Linnaeus, and Darwin have allowed science to place the work of Aristotle in proper historical perspective. While every schoolboy who has sat through an English class knows that every composition must have a beginning, a middle, and an end, even though he may seldom practice this in his own work, he will rarely be aware that the language that he is studying so long and so diligently, too, is a living, changing process. Whether language is thought or a mere attribute of the thought process, the schoolboy will tend to think of this unique attribute of man as fixed and unchanging, for he is the inheritor of those interpreters of Aristotle who bound the word to the thing and left us with the concept ". . . that

one set of persons should teach us to think, and another should teach us to speak."¹

¹Adapted from J. S. Watson, *Cicero on oratory and orators*. New York, 1896, pp. 99, 212 as cited in Wimsatt, William K., Jr., and Cleanth Brooks, *Literary Criticism*. New York, 1964, Alfred A. Knopf, p. 73.

Yet it is with this unique attribute of man, the ability to use verbal symbols as a means of apprehending his world, of storing acquired knowledge as accessible information, not only for himself, but for others of his kind, that is the common element capable of the initial synthesis between disciplines. In attempting to find separate answers to the ancient questions of what man is, from whence did he come, and what may he yet become, common origins and interests have been somewhat obscured. That the task of synthesis is an immediate one is no longer a matter of conjecture, but of necessity, has been ably expressed by many recent works from the field of science.

One of the more interesting views may be found in the work of Teilhard de Chardin (1964). In a recent collection of his papers may be found his proposal that man has reached what he calls the *grand option*.

It is significant that he has found it necessary to create a new vocabulary to express the results of his work. Despite the difficulties and demands of this new vocabulary, and with neologisms one is never sure of precise meanings, it seems that Charin suggests that man has reached a stage in the evolutionary cycle wherein he must accept or reject his involvement. Whether or not we accept or agree with his thesis, it is imperative that educators accept their responsibility to provide the student with the tools he will need to make such a decision, or at least, to contemplate the possibilities offered by those who have a keener and further view than the most of us.

Science has made more progress in this area than has communication. Far too many of the more literate peoples of the world regard communication, as did the schoolboy, as the study of grammar and literature. The study of traditional grammar and literature is only one aspect of communication just as the study of chemistry, biology, or physics are individual aspects of the whole science.

Responsibility for the teaching of communication traditionally lies with the language arts. It must be remembered, however, that language arts is a relatively new term applied to an old discipline, and for the most part, that discipline is not communication.

The discipline that is communication, like science, is made up of many areas. Like many other processes, communication is not easily defined, but must be studied by isolating its part from the process. But like most living organisms, it cannot be separated from its environment, for this is the primary goal of communication, effect.

This is by no means a proposal that language arts be replaced in the schoolroom. It is rather a suggestion that its limitations be recognized and that it be complemented by a scientific viewpoint of the real nature of communication. The tools are available; they need only to be used. We, too, have our Rays, our Linnaeuses, and our Darwins. Their names are Bloomfield, Trager, Smith, and Weiner. And like Darwin, they too overshadow traditional ways and means of contemplating the universe. These scientists of communication, linguists and theorists have amassed a great wealth of material which needs only to be utilized. Shannon and Weaver (1949) have made basic contributions with their presentation of a mathematical theory of communication. Bloomfield's (1933) study of language remains definitive in this field and Weiner's (1956) theories of cybernetics have opened new fields to the scientist, mathematician and communication theorist alike. Studies are being reported, admittedly far too many of the "I think" variety, but valuable to some extent from professional societies of both groups.

Must the secondary teacher wait until these studies and hypotheses have been reported in final and unequivocal form before they can be

integrated with present curriculum? We think not. In my own classroom, initiated by an increasing concern for the apparent apathy and inertia of far too many students, such experiments have been tried. They may not be considered valid experiments by any means, and remain empirical observations at the most. Yet they have proved to be of much benefit in helping to make the student, if not more aware of his world, know that a world does exist. They have also provided the basis for the tentative proposal that synthesis between disciplines may not only be possible, but may provide the catalyst that produces thoughtful students who are prepared to function as effective individuals within their environment.

The idea could be tentatively proposed that in so far as basic processes are concerned, the material is identical. Science studies man in his environment; communication must interpret man in his environment. The good scientist, even though he may be more concerned with man as a biological organism, will also be interested in man as an individual within his cultural milieu capable of exchanging information in intergroup activity.

Even the scientist cannot be entirely objective in his observations. He is still governed by the same sensory apparatus as others. He must still interpret the environment as he perceives it. His senses are perhaps better trained, he has overcome the language barriers of communication in his field to a greater extent, but his primary interests remain the same.

In our classroom, we have explored the patterns of the American statement, we have studied the occurrence of form patterns, and most important, we have learned that the language belongs to us. We have studied the strengths and the weaknesses of our communicative media and have learned how these weaknesses are reported within their semantical framework, and we have learned, I hope, that the word is not the thing.

Perhaps even more important than any of these somewhat technical aspects of communication, and of first importance if we are to achieve complete communication, we have exchanged ideas about the meaning of man. It is in this area that science and communication have more to offer to the other. We have tried to avoid a "lip service" correlation between disciplines and by this we mean that cooperation which exists when the science department stores the carrots for the animal experiments in the homemaking refrigerators and the English teacher borrows a flask in which to place the rose.

We have, instead, encouraged the boy who could not speak before a group, to select a subject which entered into his life and was of first importance. We were pleased as he stood before the class and fluently offered proof of, as to that time, an unproved theorem in geometry. We were even more convinced that learning should be related, instead of isolated into compartments, when he presented his paper to the Oklahoma Junior Academy of Science.

No less important than this future scholar was the boy from reform school, who only last week, articulated that fundamental social law which seems to belong more to the sciences than other fields, when he said of the biography he had read of Einstein, "And this ole boy wasn't a snob or nothin' like that." Enough perhaps to make most English teachers weep, but enough also to make one hope that for this child one will provide a better world. We have heard book reports concerning the depths of the sea, visionary views of outer space, and read reports of infinity. We checked the grammar and accepted the content.

Dr. Ware Marsden of Oklahoma State University, speaking to a class of prospective teachers, said that one of the greatest needs in education today is the need to relate the learnings, concepts, and basic ideas from one area of study to those of another.

We can account for our own fortunate experiences in this area of synthesis by serendipity. Our experience in the classroom has been made more vital and challenging as we listen to our students explore the ideas of Bryant's "Thanatopsis" and then compare them with what they have studied the previous year in biology. On the other hand, we must, as a professional group, accept the condemnation that came with the unit on Amerindian literature. As one student entered the discussion, he said, "I may sound stupid, but what I want to know is how come all these stories about the beginning of the world are so much alike?" He may find the answer to the latter part of his question if we do not allow conditions to exist in our classroom in which the first part of the question is necessary.

In summary, we would suggest that a new viewpoint be established regarding the apparent, but seemingly invalid separation of disciplines. Synthesis is not only possible, but of utmost importance if we are to truly educate the modern student. The implications are varied and many, but as always, they must begin if they are to reach the student, with the teacher.

The secondary teacher is in a unique position to make contributions in this area. Through their more intimate contact with the student, they may have the opportunity to be among the first to open the young's eyes to a whole world. Are they equipped to do this? In most cases, their training has not been from this viewpoint. They must, however, make the effort to compensate for their own lack of training through independent study. Any working, practicing teacher is fully aware of the demands such a suggestion will make in terms of already too full schedules. It has been our own experience, and that of some of the other members of our faculty, that the price is not too high. Not only does such study, unorganized and informal, solve the problem of stimulating thinking in the classroom, but it also offers rich individual rewards of intrinsic value in themselves.

As a final conclusion, we would note that it has become almost a truism to suggest that firmer relationships, or as we prefer, synthesis, be established between disciplines. The need has been established. The time has come, if we may borrow a term from biology, that a symbiotic relationship be established among disciplines.

LITERATURE CITED

- Bloomfield, Leonard. 1933. *Language*. Henry Holt and Company.
- Chardin, Teilhard de. 1964. *The future of man*. Harper and Row Publishers.
- Weiner, Norbert. 1956. *The human use of human beings*. Doubleday and Company, Inc.
- Wimsatt, William K., Jr. and Cleanth Brooks. 1964. *Literary criticism*. Alfred A. Knopf.