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Joseph B. Gittler
Iowa State College

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The Social Responsibility of the Teacher of Science

By JOSEPH B. GITTLER

It is the contention of this paper that facts of science (natural science) are being taught superlatively well by science teachers, but that the spirit of science—the logic and philosophy of science, science as an intellectual pursuit—tends to evade the domain of the science teacher. Furthermore, it is this failure to inculcate in the student this spirit of science—the scientific mentality—that accounts for some of the gravest ills in our society.

If it is true that most of society's problems are man-made (and it can be shown without difficulty that they are man-made; that they are not natural phenomena; and that social problems such as war, juvenile delinquency, adult crime, race tensions, are not inevitable), it should follow that that which man has done he can undo or that which he has failed to do and cope with, he can learn to do.

In his long career on earth man has tried numerous methods and techniques of coping with his environment, both physical and social. The story of his struggle, with its consequent successes and failures is, in the broad, familiar. It has, however, become singularly apparent that the scientific method as developed in the physical sciences during the last four centuries has turned out to be incomparably powerful in solving age-long problems of cold, darkness, famine, epidemics, distance, disease, and numerous other exigencies of life and living. Ironically, he finds himself today, partly as a result of his technological, scientific triumphs, engulfed in difficulties with his fellow men which threaten to despoil him of his enjoyment of the choicest fruits that the natural sciences have placed within his reach.

Instead of turning in this predicament to the methods which have proved so potent in the natural science fields, he still adheres to those habits of thought that the natural sciences have had to abandon. Instead of approaching his social problems with the *objectivity, logicality, empiricism*, characteristic of the scientific mind, he still seeks his answers in the contradictions of a common sense approach, in the flagrant biases of wishful thinking, and in the myths of unverifiable beliefs.

Curiously enough the professional scientist is not altogether guiltless of these errors of commission as he passes from his laboratory of tested truth and scrutinized observation to the realm of human

social relations. It would be ludicrous — if it weren't tragic in its implications — how many superlative natural scientists remove the cloak of valid scientificity and don the frailties of unscience when they enter the arena of human relations.

The writer recalls a panel discussion on juvenile delinquency conducted in one of the major cities of the middle west during the last war. On the panel was one of the country's foremost chemists whose civic interests and social mindedness moved him to active participation in the discussions and alleviations of his community's problems. It was during this panel discussion that he offered his serious solution to the problem of juvenile delinquency, which you may recall, assumed serious proportions during the war years. The chemist reasoned thus: "He is positive and [he knows] that juvenile delinquency is the result of broken homes. And broken homes," he proceeded, "have come about as the result of the invention of twin beds. And I know what I am talking about," he expostulated.

Obviously the speaker meant for his listeners of conclude that we can solve juvenile delinquency by the expurgation of twin beds from family homes. Quite a glaring example of the fallacy of *ignoratio elenchi* and hasty generalizations!

I believe that the science teacher has a real obligation and can make a real, though indirect, contribution to the solution of some of our social ills by seeking to inculcate in his students not only the substance of the sciences, but that general frame of mind and mode of thinking that has had such success in solving the problems of the natural universe.

The natural scientist has an *obligation* and a responsibility towards the development of this general scientific mind not only because he is a member of society and as such is or should be concerned with the "correct" approach to its problems, but his obligation springs also from his position in our culture.

It is now trite, but nevertheless true, to urge that this is a scientific age; that more of our culture varies with the innovations of science than with the converse. And with this age of science comes a prestige of the scientist unequalled in the history of our western culture. Several statistical scalar studies in the prestige of the professions reveal the high level of approbation and respect the natural scientist possesses in relation to other occupations in our multi-strata society. And with this prestige and status of the scientist comes the obligation on the part of the scientist to lend not just a common sense mind to social problems but his objective, care-

ful, analytical judgment, characteristic of his professional *modus operandi*.

Common sense judgment is often the most treacherous type of judgment, often the most fallacious. Common sense constitutes those untested beliefs that are handed down from generation to generation and are accepted full-blown by large masses of people. Common sense is the equivalent of folk wisdom usually finding its expression in folk sayings, aphorisms, and proverbs.

It is this all-too-great faith in common sense knowledge that often obscures its latent contradictoriness. Note the contradiction in the two sets of expressions of pure common sense, each on the same theme. "Haste makes waste," and "He who hesitates is lost"; "Absence makes the heart grow fonder," and "Out of sight out of mind." Many other varieties of common sense contradictions may be garnered. Nevertheless, one frequently notices the aura of self approbation and self certainty in social judgments especially when the judgments are accompanied by pronounced appeals that "it's just plain common sense." To the real scientific mind, this appeal should point to signs of intellectual danger. Science does not permit contradictions. In science a thing either is, or it isn't. A thing cannot be and not be. If the mind of youth can be imbued with the logicity of science, with its propensity for testing assertions, for accepting *warranted* belief only, it is my contention that a majority of society's ills would melt like the mirage in undistorted vision.

Besides this obligation to the shaping of the general scientific frame of mind, the science teacher can contribute even more directly to a sane approach to the solution of some of society's problems.

For example, many social scientists consider the problem of inter-group tensions, the problem of group prejudice, as society's most vital problem of contemporary times. If this is so, it is not difficult to see how the science teacher may contribute to the alleviation of prejudice attitudes by revealing the cultural diversity of the contributors towards the great developments in science. Some cogent residue in shaping of student attitudes can most probably be expected in pointing out the Italian background of Marconi, in noting that Einstein is a Jew, Mendelyeev a Russian, Carver a Negro. The appreciation of the cultural pluralism in the advancements of science should go a long way in assuaging, at least, one of the most serious social issues.

This is but one illustration of science teacher's direct participation in the solution of our social ills. Additional instances of possible contributions can be cited *ad infinitum*.

I have attempted to point out two obligations and responsibilities of the science teacher. First, he can contribute toward the development of the scientific way of thought as a basis for judging social phenomena and second, he can contribute directly to the education of tolerance, and truth in human relations.

Our culture no longer seems to provide guiding concepts and patterns and sanctions. The bewildering array of social problems, of internal and of international chaos and conflict, as well as the mounting anxiety and insecurity in our personal lives, appear as symptoms of the breakdown of European culture.

In the midst of these alarms and conflicts, the question of what men of scientific persuasion can do becomes one of the crucial issues of our time. The task of rebuilding our culture, of constructing a new framework of concepts and beliefs to give order, meaning, and significance to life becomes ever more insistent. But it must be clearly recognized, this is essentially an artistic task, of creating a consistent picture of the universe and of man that will not only satisfy our new criteria of credibility, but also express the new aspirations and sensibilities through which we seek to attain the enduring values. It must be emphasized that we need more than abstract scientific laws, generalizations, quantitative findings and formulas; we are waiting for a statement of the *meaning* of scientific knowledge in terms of its emotional significance for living, so that modern astronomy, geology, and biology will provide the equivalent of "Now I lay me down to sleep," in which the traditional cosmology, biology, and psychology were expressed. More concretely, we must courageously and imaginatively recreate the four basic organizing conceptions essential to culture—the nature of the universe, man's place therein, his relation to his fellows and his society, and human nature and conduct—utilizing our recent scientific knowledge and understanding and way of thinking for that purpose.*

DEPARTMENT OF SOCIOLOGY
IOWA STATE COLLEGE
AMES, IOWA

* Lawrence K. Frank, *Society As the Patient* (New Brunswick: Rutgers University Press); 1948, Page 284.