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Arts and Humanities: Reauthorization (1973-1976): Article 01

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CHEMTECH - April, 1976

The thoughts presented here had their origin in an insightful remark made by a drain maintenance specialist in our laboratory. He noted that research scientists spend much of their time in the library just reading magazines.

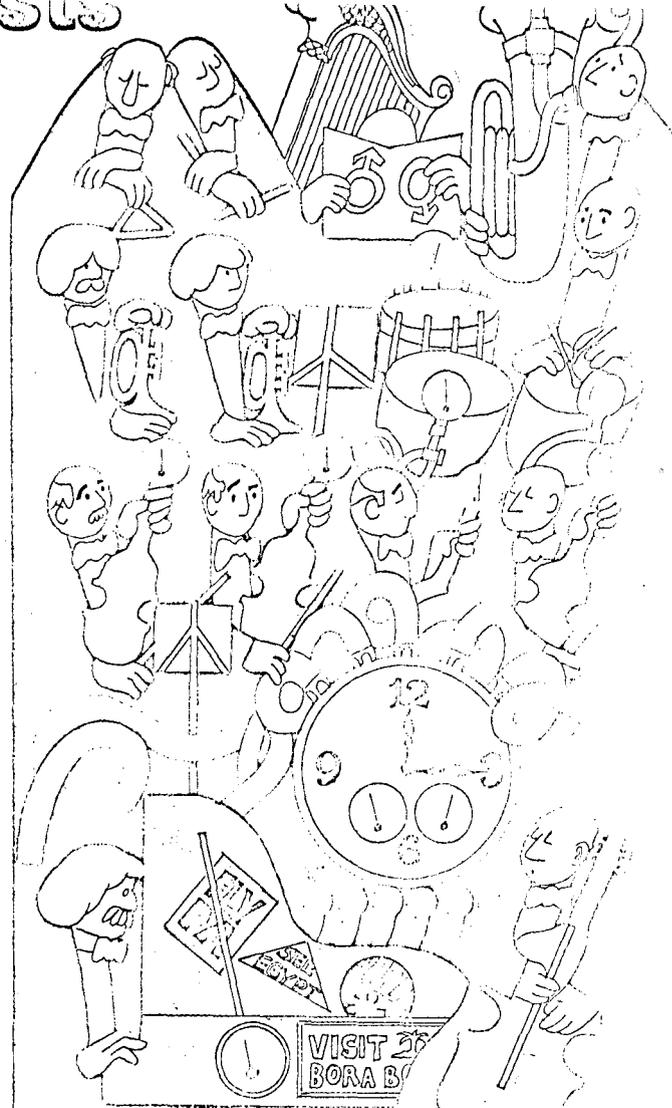
It is our public duty as scientists to see that for every research dollar spent, the public receives a dollar's worth of results. Hence the widely accepted conclusion that the management of our affairs needs much more careful scrutiny and control than in the past. Since scientists engaged in research are, as a group, somewhat less responsive to newer management techniques than other citizens appear to be, it might be well for the scientific community to ponder and profit from the management successes that have occurred in other creative fields. I am deeply indebted to the Office of Management Resources for permission to share with the reader portions of a recent study, OMR-CY 54-8-095, which earned a commendation at the Secretary's level for thoroughness and originality. Its lessons should be the subject of introspection for all of us.

Briefly, the problem that gave rise to the report was this: The symphony orchestra of one of our largest cities was found to be noncost effective. Since 37 different agencies contributed in various ways to the support of this organization, the duties and responsibilities of the government were clear, and a 38th agency was assigned to investigate the case. With remarkable sensitivity to the nuances of such a difficult problem, and with due respect to the rights of minority groups, it was decided to appoint a member of a group not previously given sufficient recognition—the totally deaf. The investigator appointed was therefore less subject to bothersome auditory distractions. His study is remarkable for its insight and clarity, and I can do no better than to quote from it directly.

"It took only the most casual observation to discover that, while musicians are paid in full for their time, they do not play all of the time. The fault is partly in the choice of music. Using a simple computer program, it was possible to score musical programs for degree of involvement for each player and to choose programs on this basis. This has resulted in a Musician Participation Improvement Program that should be more widely adopted. It will be administered through the newly created Office of Participation Improvement, which has a skeleton staff of 148.

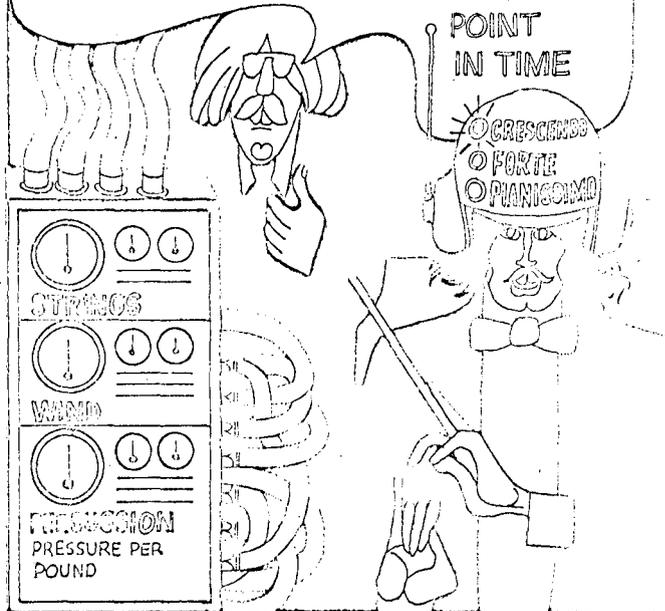
"Closer analysis of musical scores, however, revealed that many composers considered a full orchestra unnecessary and therefore obviously wasteful. By selecting works scored for smaller groups, very large savings are possible. While there has been disagreement concerning what should be retained, clearly some reduction in staff is in order.

"There appears to be little evidence of modern technology and of modern management principles in our orchestras. The piccolo clearly needs to be redesigned, and no attempts appear to have been made to improve violin design since the last century. However, the most immediate improvements are to be had by applying modern manage-



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ment expertise to orchestral direction. As is well known in military command circles, no one can direct 100 people effectively except through subordinates. On the average, one man can interact effectively with only five or six people. Clearly, subdirectors are required, and at least one should be appointed in each section to stand and receive instructions from the conductor and pass them on through the command chain to the performers. In this way responsibilities can be more clearly fixed and goals and tasks assigned.

"I have also found that communication within the orchestra is deficient. Some portion of each performance should therefore be set aside for discussion to improve the flow of organizational information and to allow subdirectors, through probing questions, to see if instructions and goals are understood. Much improvement is also to be made through standardization. For example, different conductors take different lengths of time to perform the same works. In addition, there is much repetition, and I can find no useful purpose for it whatsoever.

"However, the most glaring defect is in the reporting system. It is astounding to discover that *no* reports are written—weekly, monthly, triannually, semiannually, or annually. It is my own view that this is clearly the heart of the problem. All sorts of advance notice, programs of intent, and so forth are given, but there is little evidence on file of solid performance. Continued government support should not be provided in its absence.

"The matter of training and education has also been examined. There simply are not enough positions available to justify musical education on the scale now practiced. Only four or five replacements per year are needed, yet most orchestra members train literally dozens of students. The wastes here are staggering, and training should clearly be restricted. Further, little attention is given to the balance between instruments taught and requirements. Most instruction is in piano—an instrument often omitted from concerts entirely. And when one is used, it is almost always played by an outsider who busies himself serving many different orchestras. This policy of manpower sharing should be more widely adopted, especially as regards performers needed only occasionally, such as harpists.

"There is one specialty that appears to be in short supply, however, and that therefore demands a high salary, which contributes greatly to cost. This specialty is conducting. Of all performers, the conductor is the most vigorous, and he is the only one who performs constantly. The basic reason that there are few conductors is that there are no good texts on this vocation. Training programs should therefore be encouraged and should teach the essentials in this field once they have been catalogued. That will take some time, however. For the present, we need new and innovative solutions such as the one I propose here. Time-motion and eye-movement studies confirm my observation that conductors are able to fix visually different performers at precisely defined times and then

make sweeping gestures in their direction. In a previous study, I found that successful quarterbacks do the same thing, singling one player out of many after a precise number of counts and, with a precise overhand motion, projecting a score object in that player's direction. Since plots of quarterback and conductor ages show little overlap, it is evident that one could quite successfully become the other. This concept, called Sequential Career Commonality Utilization, is now being applied in many other fields, and the Sequential Career Commonality Utilization Branch is slated to achieve bureau status in a few years. The greatest breakthrough achieved by this branch was the finding of politician-night watchman commonalities, such as random walking, peering into darkness, and lack of a requirement for intelligent conversation, suggesting that either could serve as the other.

"Modesty forbids that I dwell too long on my final point, but I cannot omit mentioning the question most often asked me: 'What accounts for your unbroken string of successes and innovations?' My success is, I believe, due to my advantage of the broader view, of seeing how it all fits together, of knowing, if you will, the grand design. Knowing the game plan keeps one from reinventing the wheel, lets one leave the sinking ship, and lets one hit a home run without dropping the whole ball of wax, no matter how the cookie crumbles at any point in time. That's really the secret. The narrow, nonmanagement trained specialist should be on tap, but never on top."

It is my deep pleasure to be able to share these insights with you. It is easy to see how well this type of analysis and management skill applies to research management. I am, again, indebted to the Office of Management Resources for permission to reprint the above quotation.

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Back in '43 Norman G. Anderson married the former Mary Lloyd Guildwell at the age of 24. (He was; we don't know how old she was.) They have two children. Prior to doing either, he acquired three degrees at Duke while he learned about physiology and zoology. He fled to this career after trying to master abnormal psychology at Minnesota. Before he could do so, however, the Navy got him. It was while in its service that he got married; they had him mostly taking pictures and messing about with cameras. Since those happy times, he's published widely (>200 papers) about cells, viruses, and other living things; accumulated nearly a dozen awards including most recently the Van Slyke Award, and, earlier, the coveted Klinsche Chemie Preis Biochemische Analytik (10,000 D.M.). Inventor of the Ge MSAEC Fast Analyzer, Dr. Anderson is Associate Director for Basic Science of the South Carolina Memorial Cancer Institute at Charleston.

