Letters

Management Techniques

The article "Science and management techniques" by Norman G. Anderson (22 Feb., p. 726) provides an appropriate model to describe the situation that exists in a university. There remains one question to complete the model. How does a performer in a symphony orchestra get word to the conductor that the percussion section is reading the score from the "1812 Overture," the string section, "The Pastoral Symphony," and the brass section "Stars and Stripes Forever"?

T. S. STORVICK
Department of Chemical Engineering, University of Missouri, Columbia 65201

Hurray for Professor Anderson. One can always recognize the managerial point of view. Unfortunately his preoccupation with science has led him to take a production-oriented view of the problems of the symphony orchestra. A more market-oriented view enables one to cut through quickly to the essence of the problem.

Symphony orchestras are nearly all bankrupt and hence a drain on the public purse. The reason, as Anderson almost sees, is that they are labor intensive, and thus face the rising costs associated with the employ of wage earners. At the same time the popularity of symphony programs, and hence revenues, are decreasing.

The answer to the cost-revenue squeeze is simple. A quick look at an orchestra's table of organization reveals the labor problem—too many violins. There are roughly two violins for every other instrument in the orchestra. To resolve the problem, all that is necessary is to drop the ancient habit of having two teams of violins play at once. A second team player need show up only when the first violin player is sick. With such a move the labor cost could be cut 30 percent.

Examination of the revenue question requires market research—also necessary for the market-oriented view. Fortunately, other studies have been conducted. The typical listener would prefer to hear less than 50 works—those the poets call "war horses." If orchestras stopped playing the deservedly obscure stuff they do and concentrated on the works their audience wanted to hear, ticket sales would move up. Moreover, there would be important side benefits. Orchestra libraries could be cut by two-thirds or more (perhaps providing space for a bar); and, much more important, rehearsals could be cut. Orchestras spend 2 hours in rehearsal for every hour in concert. If musicians always played the same thing they wouldn't have to practice so much. The result would be more concerts or fewer expensive labor hours (musicians could teach to maintain their income). By such a move the revenue-cost relationship could be improved 20 to 30 percent.

These two improvements would take orchestras off the dole with one important result—more money left for professors!

JOSEPH L. BOWER
Graduate School of Business Administration, Harvard University, Cambridge, Massachusetts 02163

At last Taylor's "one best way" (*1*) has come to the symphony orchestra. Bows, blows, clops, grunts, and conductorial gestures and paroxysms will soon be specified by therbligs for each work, and all those uneconomical variations in performance will at last be eradicated. Just think: interchangeable musicians and conductors.

But where is consideration for the energy crisis? Could not all the forceful exhalations be gathered together in a tube and the flailing bow-arms linked up to some contraption to perform residual work, say, perhaps to run a small electric generator?

As for violin and piccolo, it's back to the drawing boards. Surely they could be redesigned so that "paramusical" personnel, trainable in a few weeks, could be substituted for experienced musicians, who keep running orchestra budgets into the red.

Meanwhile, scientists rejoice; if Anderson's words are heeded, our modest and clever young management engineer will shortly be with you—even before 1984!

MAURICE O. BURKE
750 Green Bay Road, Winnetka, Illinois 60093

References

1. F. W. Taylor, *Principles of Scientific Management* (Norton, New York, 1967).

Safety of Cosmetics

In his letter on injuries related to cosmetics (29 Mar., p. 1246) John L. Donaldson points out that data from the National Electronic Injury Surveillance System (NEISS) are limited to injuries treated in hospital emergency rooms.

In arriving at my estimates, I utilized the NEISS estimate (*1*) that 62 percent of product-related injuries are not treated in emergency rooms. Thus, my figures are not limited to injuries treated in emergency rooms.

MURRAY BERDICK
Research Laboratories, Chesebrough-Pond's Incorporated, Trumbull, Connecticut 06611

References

1. *NEISS (Natl. Electron. Inj. Surveil. Syst.) News* 1, No. 5 (July 1973).

Radioactive Waste Disposal

In discussions about the problem of nuclear waste disposal, critics are fond of saying that these wastes will be a burden on future generations for thousands of years. However, it should be pointed out that, according to the present plan, these wastes are kept in retrievable form and will become an asset rather than a burden after 500 years. By that time, the gamma ray emissions from fission products will have decayed away, and the principal radioactive hazard will be the easily shielded alpha particle emissions from plutonium and other actinides. The radioactivity of this material will be only 20 times as