Mettler balances help to teach freshman chemistry to more students in less time

Ohio State University was one of the first major universities to use modern substitution balances exclusively in its Freshman Chemistry course. "Our choice of the Mettler was dictated by the needs of the students," said Clarence L. Love, Freshman laboratory manager.

"We have about 3,400 students going through Freshman Chemistry each quarter. This heavy teaching load and strict time limitations place demands on our equipment that the traditional double-pan balances just can't meet."

Because laboratory results depend upon the student's ability to make rapid and valid measurements of mass, the first portion of laboratory work is devoted to measurement and the use of the balance. "With the old double-pan balances, we had to spend as much as three laboratory periods teaching weighing procedures...and even then some students didn't learn it adequately. Now, with Mettler balances, students learn proper weighing procedures in a much shorter time. Over the long term, we find that one Mettler H6 Balance does the job of four or five of the old double-pan balances."

"Junior and senior staff members as well as the students themselves evaluated several different balances. We collected all their observations and found that the Mettler was preferred. The reasons most frequently mentioned were Mettler's ease of use, convenience, and ease of routine maintenance."

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The MS-10 was initially introduced in 1960 by AEI (the world leader in mass spectrometry). Since then, hundreds have gone into service throughout the world and, quite literally, there are now more MS-10's being used than any other mass spectrometer. By far. As a result, the MS-10 has been applied to more end uses than any other piece of equipment. The implication of this: the chances are good that, whatever your application, someone has already applied the MS-10 to it.

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We might as well admit that people inevitably buy the MS-10 after they've tried it. So we love to rent them. We've obviously learned that it makes sense to put the MS-10 on the road to sell itself. (To short-circuit this sequence, why not skip the rental and consider buying the MS-10 immediately?)

For more on the instrument, write for bulletin M1S3. For more on renting the instrument, write for bulletin RM1S3. For more on both, write for both.
ing to pay the additional cost of dual brakes. In my opinion the difference in cost would be so small that buyers wouldn’t feel it. (The American Motors design consists of a simple mechanical separation in the master cylinder between the flow of rear-wheel brake fluid and the front-wheel brakes.) The industry has been busy selling a “new” brake innovation, disc brakes. The disc-brake patent is more than 40 years old and is in the public domain . . .

The automobile industry used to be looked upon as the leader in quality control and reliability. In recent years these have been sacrificed because of higher labor costs . . . and the practice of including an obsolescence factor in design . . .

ABRAHAM L. KORR
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Project Orion

In “Death of a project” [F. J. Dyson, Science 149, 141 (1965)]. Project Orion is described as “a project to design a vehicle which would be propelled through space by repeated nuclear explosions occurring at a distance behind it.” The author says that “Designs were worked out in detail for vehicles that could carry eight men and a payload of 100 tons on fast trips to Mars and back” after the vehicle had been “lifted into space by Saturn chemical rockets.”

Space travel consists essentially not of being “propelled through space” but of acceleration, followed later by equivalent deceleration. The original acceleration given to the proposed vehicle by the Saturn rockets could, as is now standard practice, be later counteracted by the decelerative effect of returning through the earth’s atmosphere. But where is there any discussion of the fact that all of the acceleration added by the exotic means of “propulsion” would have to be subtracted later by conventional means, since it is quite obvious that the new, exotic means could not be used for deceleration?

Perhaps that is why the project was dropped.

JO FISHER FREEMAN
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Woodlands in the Great Plains

Commenting on a report in which P. V. Wells (1) points out that non-riparian woodlands occur on topographic breaks in the Great Plains and suggests fire and other factors to partly account for the grasslands on more level topography, G. Ehrenfried (2) cites an 1860 publication which describes fires caused by Indians as evidently accounting for an extension of the prairies in Canada.

In March 1805, in a letter to his mother, Meriwether Lewis (3) wrote concerning the country along the Missouri River between the Platte River and Ft. Manda, North Dakota:

With respect to this open country, I have been agreeably disappointed. From previous information I had been led to believe that it was barren, sterile and sandy; but, on the contrary, I found it fertile in the extreme, the soil . . . consisting of a fine black loam . . . [with] a luxuriant growth of grass and other vegetable productions, particularly such as are not liable to be much injured, or wholly destroyed by the ravages of the fire . . . . there can exist no other objection to it, except that of the want of timber . . . . This want of timber is by no means attributable to a deficiency in the soil to produce it, but owes its origin to the ravages of the fires, which the natives kindle in these plains at all seasons of the year. The country on both sides of the river, except some of its bottom lands, . . . is one continued open plain, in which no timber is to be seen except a few . . . clumps of trees, which, from their moist situation, or the steep declivities of hills, are sheltered from the effects of fire.

Thus 160 years ago Lewis recognized nonriparian as well as riparian forests in the midst of the grasslands, attributed the treeless condition to man-caused fires, and recognized the fertility of the soil. It was evidently Major Long, after his 1820 expedition, who applied to the Great Plains the name “Great American Desert,” which term was subsequently publicized by James Fenimore Cooper in his novel The Prairie (1827). From this came the long-held belief in the treelessness of the Great Plains.

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References
2. G. Ehrenfried, ibid., p. 1173.

25 March 1966

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