called to an editorial article with the above caption, in the *American Journal of Mining*, April 25, 1868, Vol. V., p. 264, which later became the well-known *Engineering and Mining Journal*. A comparison of what is accomplished now with the scientific view of that day, a little over fifty years ago, may prove interesting to the readers of SCIENCE.

In part, the article states:

> Inventors have puzzled their minds for ages to compass the problem of air navigation by machines or by flying men; and but little advance has been made. . . . It would of course be absurd to affirm that anything could not be done, in this age of the world; but while this feat may be accomplished to an extent "enough to say so," we are incredulous of any practical benefit of the thing to man. . . . The force which a man is able to expend in rapid ascension of heights, even with the firm earth under his feet, is very small; and we have never seen any principle elucidated which was able by apparatus to increase his power or lessen his gravity in proportion to it.
>
> The balloon remains; but that, if used, presents such a surface to the atmosphere that it can not be accurately guided without, by means of steam-boilers or other weighty machinery, storing up power for propulsion, in a manner of itself too cumbrous and heavy for successful navigation.
>
> So that, whether it is for his own personal flight through the air or the management of a great atmospheric ship, man seems to be hemmed in on every side by almost insuperable natural difficulties. And besides, even were all this obviated, who would run the risk of accidents at a great height above the earth, beyond the reach of help—but not of gravitation? It is an interesting problem, and may result in pretty scientific toys; but for real helpfulness to humanity we see but little in Aeronautics.

Taking the vast change that has been worked out in the life time of many of us, does it not afford encouragement to our young people to endeavor to solve the many problems lying before them, ere the next fifty years shall pass?

M. E. WADSWORTH,
Dean Emeritus
SCHOOL OF MINES,
UNIVERSITY OF PITTSBURGH

KEEPING STEP

TO THE EDITOR OF SCIENCE: Sound travels about 1,060 feet per second at 0° C., or 265 feet in one fourth second. The soldier next the drummer steps with the drumbeat, the soldier 265 feet in the rear is one fourth second late and has his foot in the air when the foot of the front man is on the ground. This is because they march at 120 steps per minute (2 steps per second), which gives one half a step in one fourth second. Hence the soldier who hears the signal one fourth second late will fall one half step behind. I have seen this in columns turning into Victoria Street from Westminster Cathedral, at Lancaster Gate or Holloway Road, on Salisbury Plain, etc.

When tired out or on rough roads soldiers left to themselves do not keep step; but it is a remarkable fact that the only time they keep perfect step is when they are without sound signals. If the drum begins they lose perfect step at once and the feet are seen to strike the ground in receding waves as the sound passes down the line. If the drum stops, the men in two or three seconds get into perfect step again, and go with a sway and swing absent at other times. The French term it *rapport* or *esprit du corps*. Is there a mutual subconscious force passing between the men? In a short brochure of experiments in such matters to be found at public libraries I have suggested an explanation. Is it the right one? I should be glad to hear from American observers of the phenomena.

WALTER MOORE COLEMAN,
Fellow of the Physical Society of London
HARSTON, CAMBRIDGE, ENGLAND

QUOTATIONS

THE ORGANIZATION OF RESEARCH IN GREAT BRITAIN

IN a paper on the state organization of research, read at a recent meeting of the Royal Society of Arts, Sir Frank Heath, K.C.B., Secretary of the Department of Scientific and Industrial Research, succeeded in compressing into a few pages a lucid amount of the work of his department. His characterization of research in general is, so far as it goes, excellent, and ought to be taken to heart by the