Taking as examples the cases $m = 4$, $n = 9$ and $m = 5$, $n = 7$ we write down a list of integers in congruence classes modulo m:

$m = 4, n = 9$

0	1	2	3
	5	6	7
	9	10	11
		14	15
		18	19
			23
			27

$m = 5, n = 7$

0	1	2	3	4
	6	**7**	8	9
	11		13	**14**
	16		18	
	21		23	
			28	

Each column ends with a number in bold type which is the lowest score possible in the particular congruence class, after which all scores in that class are possible by addition with members of the class congruent to zero modulo m.

Taking $m < n$ and $(m,n) = 1$ as in the original article, we find that each column of omissions ends at a multiple of n, tn say, where $t \in \{0, 1, 2 \ldots m-1\}$. There are exactly m of these multiples—one for each congruence class.

The number of omissions in the class containing r is $(tn - r)/m$ (for $r = 0, 1, 2 \ldots m-1$), which is the same as $[tn/m]$ since $r < m$. The total number of omissions is $\sum_{t=0}^{m-1} [tn/m]$, and this gives the solution $\frac{1}{2}(m-1) \times (n-1)$ as before.

The highest omission occurs in the congruence class containing $(m-1)n$, and its value is $(m-1)n - m$ or $mn - (m+n)$.

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Notation and language in school mathematics

DEAR EDITOR,

Many members have sent comments on the (original) article on this subject in *Gazette* No. 407 (March 1975); in fact, letters continue to arrive! In general, comments support the recommendations made and there is little that we should wish to change. Perhaps the most important point to mention now is that our suggestions for the use of S^2 and s^2 in statistics are the reverse of what is common practice, and we should be glad to follow existing usage, exchanging the two symbols.

In the letters received a number of suggestions have been made for further work by the committee, and members may yet wish to draw our attention to matters not covered by the original article. Those who wish to raise any further points on this subject should

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write to me **by 30 November**. The committee will then work through all the suggestions made and a further article with recommendations will appear.

Yours sincerely,

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Let's take mechanics seriously

DEAR EDITOR,

Few people doubt the importance of newtonian mechanics; its applications include all motion that men have achieved and much of what they have observed. Yet in British schools the subject is dying by a thousand cuts—why?

I suggest three reasons:

I. "Applied mathematics is wider than mechanics and newer applications are interesting."
II. "Other countries don't teach mechanics as a part of school mathematics."
III. "Newton's laws are simple in their basic expression, so there is not much to learn."

Besides these reasons there is a psycho-social cause, alias "fashion". However, I believe this is a schoolteacher's fashion; engineering and physics have not changed their nature. School level linear programming, game theory and electrical circuits use a pretty narrow range of mathematical tools and, although their results are considerably less than 300 years old, they are a long way from the boundaries of modern knowledge. It is irresponsible to drive out most of mechanics simply to give ourselves a fresh set of lessons to teach. Reason I is also weakened by this argument.

As for II, our history and present system are different from those of other countries and our national record in science and engineering is extremely good, though we have not done so well at exploiting our ideas and selling the products. The sequel to our sixth form preparation is a three-year degree course. But we do not teach mechanics only for vocational reasons. Newtonian mechanics is a major human achievement with a bright future; extensions, refinements and alternatives start from it and are compared with it. Imaginatively taught, even at school (on the lines of Kilmister and Reeve's *Rational mechanics*), it fosters understanding of the real world and our models of it.

Reason III is the subtlest, for it *is* true that Newton's laws can be stated simply and the applications to the usual set of sixth form problems are quite short. *It does not follow that mastery of these problems can be achieved quickly.* Traditional single A level courses give three periods a week for two years to mechanics, and quite clever pupils need a good year and a half to learn to apply the equations successfully. The ideas often begin to 'click' (despite all the teacher's repetitions) only in the second year. There is a perfectly good reason for this slowness, and a philosophical term for the circumstances. Newtonian mechanics is wide, powerful and applicable to something convincingly like the real world. A broad range of problems can be tackled, often with the aid of subsidiary assumptions, empirical laws and such approximations as inelasticity, a coefficient of friction or a constant gravitational field. Gaining experience of these problems takes time, but it is time well spent. Complexities such as elasticity, inverse square law gravitation and non-linearity can extend the simple models. Professor T. S. Kuhn's *Normal science* describes just this situation in which a "paradigm" is systematically learnt, applied and extended; he demonstrates that such activities form the main activity of most scientists most of the time.

I believe that it is our responsibility to see that we choose a scientifically respectable paradigm that is of central importance in as many fields as possible for our applied