

that they are precisely inverted! Furthermore, by the dimensionality of current that Maxwell himself proposed, those same expressions should have had very different dimensionalities than the ones he proposed. This is shown below in **Table 2**, employing Maxwell’s dimensionality of current and its aetherometric equivalence, to produce even more discrepant results:

TABLE 2
Dimensionalities of **H** and **B** obtained by treating aetherometrically
Maxwell’s wrong dimensionality of current **I**

		cgs	SI
H	‘Magnetic force’	$4\pi (dI_{\text{free}}/ds)/c = j = \ell^{-1}$	$dI_{\text{free}}/ds = j = \tau^{-1}$
B	‘Magnetic induction’	$4\pi [d(I_{\text{free}}+I_{\text{bound}})]/ds = j = \ell^{-1}$	$d(I_{\text{free}}+I_{\text{bound}})/ds = j = \tau^{-1}$

The curious feature of this exercise is that, by providing the wrong dimensionality for current, Maxwell sacrificed only the consistency of the cgs system’s treatment of **H**, but managed to maintain the dimensionality of **H** in the SI system, as well as the co-dimensionality between **H** and **B** in both systems of units.

When we consider Maxwell’s error regarding the dimensionality of current, the obtained dimensionalities of **H** and **B** should be rather different from those in **Table 2**, and should instead have the attributions shown below in **Table 3**:

TABLE 3
Dimensionalities of **H** and **B** obtained by treating aetherometrically
expressions that are a correct function of current **I**

		cgs	SI
H	‘Magnetic force’	$4\pi (dI_{\text{free}}/ds)/c = j = \tau^{-1}$	$dI_{\text{free}}/ds = j = \ell\tau^{-2}$
B	‘Magnetic induction’	$4\pi [d(I_{\text{free}}+I_{\text{bound}})]/ds = j = \tau^{-1}$	$d(I_{\text{free}}+I_{\text{bound}})/ds = j = \ell\tau^{-2}$

And this complete inconsistency is further compounded by the fact that, in the SI system, the function **B** is also taken as equivalent to $\mu_0\mathbf{H}$; if **H** is an acceleration, this second equivalence requires **B** to become dimensionally equivalent, as we have already seen, to ℓ^{-1} .

We could construct a table of all these successive discrepancies (see **Table 4**) for the reader to take stock of the situation and its pitfalls - bearing in mind that none of these results will, in the end,