CORRIGENDUM

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Correction to the paper. 'Derivation of the Lorentz transformations from the constancy of the speed of light', by Brent Mundy, Philosophical Studies 44, 1983, pp. 291–203.

The last paragraph of Section 3 of the paper, p. 298, and the associated note 6, are not correct as they stand. The presence of a dilation component in an affine transformation is an intrinsic affine property of the transformation, indentifiable algebraically by the determinant of the transformation matrix being different from 1 in any affine coordinate system. A Weyl automorphism leaving fixed one leg of the basis tetrad corresponds to a passive transformation to a coordinate system which has one unit basis vector in common with the original coordinate system. Any such Weyl automorphism will have determinant equal to 1. Thus, the Weyl automorphisms without dilation can indeed be picked out (in a Weyl space of dimension 3 or greater) by the procedure described in the paper. However, it remains to be shown that the transformation relating the *physical* reference frames will fall within this geometrically well-defined class. To establish this, we add the further physical assumption that two frames will agree in measurements of lengths perpendicular to their direction of relative motion. (This is equivalent to sharing a common basis vector.) This assumption must be added to those stated in the paper, to complete the derivation of the transformations without a dilation. Since this assumption was also accepted in pre-relativistic physics, the main claims of the paper seem still to hold true.

It should be noted that this assumption is a special case of the special principle of relativity, one which happens to hold in pre-relativistic physics as well. Thus, those who maintain that the relativity principle must be invoked in addition to the light principle to derive the Lorentz transformations gain some grounds for their view. However, the point remains that no *new* propositions (ones not accepted in pre-relativistic physics) are here being derived

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from the relativity principle. The light principle is the only new proposition in this sense which must be introduced, in order to derive the transformations.

The statement in Note 6 concerning the need for three dimensions is incorrect. The geometrical fact of an affine transformation involving a dilation (determinant not equal to 1) is well-defined regardless of dimension, so that *mathematically* there is no need for a third dimension, to distinguish those Weyl automorphisms which involve a dilation. A third dimension is required only in order to invoke the physical assumption stated above, leading to the conclusion that the *physical* coordinate transformations do not involve a dilation.

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