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TITLE: (6) Isotropic space with discrete gravitational field sources (Towards a theory of the non-homogeneous isotropic universe)

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TEXT: It is pointed out that all existing relativistic cosmological theories are exceptionally inconsistent. Thus, while on the one hand the average energy-momentum tensor is inserted into the right-hand side of the Einstein equations

$$R_i^k(g) - \frac{1}{2}\delta_i^k R(g) = \frac{8\pi k}{c^4} T_i^k \text{ (micro)}, \qquad (7)$$

the left-hand side of these equations is not subjected to this averaging process. The hybrid equations obtained as a result, in which only one half of the equations is averaged, are incorrect both from the microscopic and macroscopic points of view. In the present paper the author investigates the average behaviour of isotropic space in which gravitational field fluctuations due to
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local irregularities in the mass distribution are small. The case of large average densities of matter is not considered, although extrapolation to this region of the solution found for a weakly nonuniform micro-field does yield interesting predictions as regards the expected behaviour of the exact solution for an average metric at very high densities.. It appears that when the discrete mass distribution is considered, the average metric will not contain singularities. These conclusions are deduced from a new cosmological equation which is derived in the present paper and reads as follows:

$$R_i^k(G) - \frac{1}{2}\delta_i^k R(G) + C_i^k(G) = \frac{8\pi k}{c^4} T_i^k \text{ (macro)} \qquad (48)$$

Comparison with Eq.(7) shows that this equation includes the additional term $C_i^k(G)$, which depends on micro-field fluctuations. It is shown that although Hoyle has reported an equation which in its external appearance is very similar to Eq.(48) and includes the term $C_i^k(G)$, the term was introduced simply as a "correction", whereas in the present theory it is a consequence of the Einstein
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equations and appears naturally as a result of the averaging process. This new equation is now solved for a flat space, for a space of positive curvature and a space of negative curvature. In distinction to the Friedman model, the extrapolated form of these solutions do not contain a singularity at which the density of matter becomes infinite for some initial instant of time.

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