

CHAPTER 1

The Hoyle-Narlikar Theory of Gravitation

1. Introduction

The success of Maxwell's equations has led to

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MS-PHD-O... 21 MS-PHD-O... 22 MS-PHD-O... 23 MS-PHD-O... 24 MS-
PHD-O... 25

MS-PHD-O... MS-PHD-O... 27 MS-PHD-O... 28 MS-PHD-O... 29 MS-
PHD-O... 30 MS-PHD-O...

31 MS-PHD-O... 32 MS-PHD-O... 33 MS-PHD-O... 34 MS-PHD-O... 35
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electrodynamics being normally formulated in terms of
fields that have degrees of freedom independent of the
particles in them. However, Gauss suggested that an
action-at-a-distance theory in which the action travelled
at a finite velocity might be possible. This idea was
developed by Wheeler and

Feynman (1,2) who derived their theory from an action-principle
that involved only direct interactions between pairs of
particles. A feature of this theory was that the
'pseudo'-fields introduced are the half-retarded plus
half-advanced fields calculated from the world-lines of the
particles. However, Wheeler and Feynman, and, in a
different way, Hogarth were able to show that, provided
certain cosmological conditions were satisfied, these
fields could combine to give the observed field. Hoyle and
Narlikar (4) extended the theory to general space-times and
obtained similar theories for their 'C'-field⁵ and for the
gravitational field (6). It is with these theories that
this chapter is concerned.

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