

(non-theory laden) observation of the single big-bang model cosmology as a refutation of the principle of relativity! I do not see that such an observation has ever been made.

I have discussed some of the underlying ideas of the theory of relativity in a recent book,² and I have recently demonstrated the Hubble law as a first approximation for a *bona fide* covariant equation of motion in a generalized mathematical expression of general relativity theory, where no absolute global time measure appears in the metric and where the oscillating universe cosmology is automatically incorporated.³

References

1. A. Einstein, *Autobiographical Notes*, in *Albert Einstein—Philosopher—Scientist*, Evanston, Ill. (1949), page 75.
2. M. Sachs, *Ideas of the Theory of Relativity*, Jerusalem and New York (1974).
3. M. Sachs, "The Hubble Law and the Spiral Structures of Galaxies from Equations of Motion in General Relativity," *Int. Jour. Theoret. Phys.* 14, 115 (1975).

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THE AUTHOR REPLIES: I disagree with Mendel Sachs's assessment that a conclusive "observation of the single-bang cosmology" (by which he means evidence that the universe will expand forever from the past big bang as in some Friedman models) would constitute "a refutation of the principle of relativity." It is possible for the laws of nature, the field equations, to be independent of the reference frame, while the solution describing the large-scale behavior of the universe has a high degree of symmetry in certain frames.

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H. G. Wells and isotopes

After working in the area of discharge isotope separation for the past two years, and thinking it to be a rather novel approach, it was with great amusement and chagrin that we read William Squire's letter (August, page 66), describing the possibility that the first discharge isotope separation experiments actually occurred in 1895. Although our comments are not meant to detract from the inventiveness of H. G. Wells, we would like to point out that based on experience in this laboratory (essentially another case of 20/20 hindsight), an isotopic interpretation of Baly's work seems improbable due to the extremely large enrichment factors required. Instead we feel that, in his dis-

charge, Baly produced ozone, which increased the measured oxygen density.

In experiments on discharge enrichment of N^{15} (*Applied Physics Letters*, 28, 372, 1976), the highest enrichments observed were less than 30%, and these were obtained only at cryogenic temperatures. At room temperatures and above, the enrichments were always negligible. In the case of deuterium enrichment in the hydrogen methane system (T. J. Manuccia and E. E. Geosling, submitted to *Appl. Phys. Lett.*) enrichment factors as large as 6 were indeed observed, but again, this was at low temperatures, and it should be pointed out that the H/D system will always show the largest isotope effects due to it having the largest $\Delta M/M$ of any pair of stable isotopes. To achieve the observation of Baly, namely an average density increase of about 1% starting from natural abundance of 0.2% an enrichment factor of over 40 would be required. This is extremely unlikely, especially at room temperatures and high (350 torr) pressures. More probably, Baly was observing the production of ozone at the 2% level in his mixture. Alternative explanations could involve impurities outgassed from his electrodes.

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Sexism in science

No one would disagree with A. V. Ferris-Prabhu (July, page 69) that the effort to seek out and encourage capable women is as important as the preoccupation with changing words. But I have a gut fear that the capable, independent, self-motivated woman is just the person who might object to the following:

- Papers she submits to the *Astrophysical Journal* will go out to referees with a form letter asking, "Is his work . . . , does he . . . , does his work . . . , and so on."
- Applications to NASA for position of astronaut ask for names for recommendations. Forms to these people ask, "Is he . . . , does his work . . . , and so on."
- Her work may be discussed in a national magazine under the title "Wise men from the South peer toward what may be limits of the universe," (*Smithsonian*, April 1977). At least her husband will find this funny.
- A distinguished scientist, the president of the Board of Directors of the US National Observatory, will look her (the only female) hard in the eye and call each Directors' meeting to order by firmly saying, "Gentlemen."
- She will read in an international scientific magazine (*Nature* 265, 17, Feb. 1977) an article entitled "Strategy for detection of cancer hazards to man," in

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