bution to the observed value of $\Delta T/T$ at comparatively large W
(W $\gtrsim$ 0.24-0.31 when Ωh^2 = 1-0.1) which are of most importance in the
whirl cosmogony.* Comparison with the observed upper limit $\Delta T/T \lesssim 10^{-4}$
shows that the whirl theory in its present state is invalid <u>unless</u>
$\Omega h^2 \gtrsim$ 0.3-0.4.

We conclude that both primaeval whirls or "white noise" adiabatic
density perturbations responsible for galaxy formation may be compatible
with the available upper limits to $\Delta T/T$ only in a dense enough Universe
($\Omega h^2 \gtrsim$ 0.3-0.4).

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*It should be noted that the value of $\Delta T/T$ from the last scattering
calculated by Anile et al. (1976) and used by Parijskij (this meeting)
was overestimated by about one order of magnitude (Kurskov and Ozernoy
1977b).

RECENT ADVANCES IN MICROWAVE COSMOLOGY

Paul Boynton

In summary, this brief communication outlined first the recent
measurement of large-scale anisotropy of the relic radiation by the
Berkeley group of Smoot, Gorenstein and Muller (1977). The customary
peculiar velocity interpretation of the dipole term gives v = 390 ± 60
km/sec in the direction of $\alpha = 11^h.0 \pm 0^h.5$ and $\delta = 6^o \pm 10^o$. These
values differ from the preliminary results of Corey and Wilkinson (1976)
by less than twice their reported errors.

Secondly, the latest observations by G. Lake and R. B. Partridge
(1977a, 1977b) of clusters of galaxies seeking evidence for inverse
Compton "cooling" of the microwave background were reviewed. Signifi-
cant effect was indicated in each of the richness class 4 clusters
observed:

Abell Cluster	$\Delta T \pm 1\sigma$
1689	-1.06 ± 0.46 mK
2125	-3.10 ± 0.34 mK
2218	-2.65 ± 0.23 mK

The remaining 8 clusters (richness class 2 and below) showed no temperature deviations beyond ± 0.4 mK (± 2σ). All measurements were made at 9 mm with a resolution of ∿ 4'. Some of the values quoted above have been "updated" since the symposium.

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DISCUSSION

Silk: There seemed to be a positive deflection in the direction of Abell 426.

Boynton: Yes. This is the Perseus cluster in which there is known to be an intense discrete radio source at centimetre wavelengths.

Parijskij: I mentioned on Tuesday that the new result by Partridge on the Sunyaev-Zeldovich effect in the Coma cluster does not contradict our result in the sense that they do not reject the possibility that the effect exists. The numbers quoted by Partridge and by us do disagree and new observations should be made with special attention to the problem of discrete sources.

     At the same time, it seems to me that in the Coma cluster the effect is rather small compared with ones expectation from the intensity and spectrum of the X-ray emission. The mass of gas obtained from observations of ΔT/T seems to be less than that from the intensity of the X-ray emission. This may be due to clumpiness in the gas. It may well be that in the future the best way to find this out is to take the temperature from the X-ray observations and compute the mass from the Sunyaev-Zeldovich effect.

Boynton: Let me just comment that while your result may be consistent with Partidge's result at your 3σ level, his is not consistent with yours at his 3σ level.