the Universe there exist anti-Universes which will be 'pockets' of antimatter.

If the Universes and anti-Universes were assigned angular velocities of $\pm c/R_u$ relative to the infinite Cosmos, then indeed the non-conservation of parity would be expected. Suppose that we view the Cosmos from a frame of reference which rotates with angular velocity, $\omega = c/R_u$. A clock which rotates at radius, r , will behave (so far as physical measurements in the rotating frame are concerned) as if its time intervals were lengthened by the factor $(1 - \omega^2 r^2/c^2)^{-1/2}$. Denoting this factor by γ , its angular velocity will then appear to be slowed down by a factor, γ^{-1} , and we have to introduce two angular velocities, ω , and ω_0 , which are related by:

$$\frac{\omega}{(1 - \omega^2 r^2/c^2)^{1/2}} = \omega_0; \quad \omega = \frac{\omega_0}{(1 + \omega_0^2 r^2/c^2)^{1/2}} \quad (1)$$

Whereas ω is a function of r , ω_0 is a constant. Whereas $\omega r \rightarrow c$ as $r \rightarrow \infty$, we see that $\omega_0 r \rightarrow \infty$ as $r \rightarrow \infty$. The difference is just the Thomas precession^{1,2}:

$$\omega_0 - \omega = (\gamma - 1) \omega = \left(1 - \frac{1}{\gamma}\right) \omega_0 \quad (2)$$

What appears to happen, therefore, is that the centre of rotation moves in such a manner that the rotational velocity of distant matter can never exceed c .

With regard to the nature of quasars, it would seem to me that they must be what they appear to be—stars within the galaxy—and that another explanation for the large red shifts must be found. Possibly we are witnessing a nova or flare-type outburst.

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3p⁶–3p⁵3d Transitions of Fe IX and Ni XI in the Solar Spectrum

USING rocket spectroscopy, Hinteregger *et al.*¹ obtained interesting new solar lines, the majority of which could not be classified up to now. Among these lines, two strong lines at 171.1 Å and at 148.5 Å have been seen. We have been able, using the technique of differentiation between different degrees of ionization^{2,3}, to classify these two lines as the 3p⁶ 1S₀ – 3p⁵3d 1P₁ transition of Fe IX and Ni XI. This line was found to be very prominent in the isoelectronic sequence of A I (Table I). The foregoing classification is based on the assumption of LS coupling.

Table I. 3p⁶ 1S₀ – 3p⁵3d 1P₁ TRANSITION LINES OBSERVED IN THE VACUUM ULTRA-VIOLET

Ion	λ Å	
	λ Å	1/λ cm ⁻¹
V VI	224.504	445,430
Cr VII	202.826	493,030
Mn VIII	185.459	539,200
Fe IX	171.075	584,540
Co X	158.780	629,800
Ni XI	148.610	672,900

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RADIO ASTRONOMY

Possible Secular Variation of the Flux and Spectrum of Radio Emissions of Source 1934–63

THE recently studied source 1934–63¹ is characterized by maximum spectral flux density at a frequency of $\nu_m \approx 600$ Mc/s. Recently, spectra of this type have been obtained for a number of sources, some of which are identified with quasi-stellar objects (for example, 3C–48). In none of the known sources of this type, however, does the frequency of the maximum reach such a high value as in the case of 1934–63.

Sligh explained such spectra by reabsorption of synchrotronous emission, and developed a method for evaluating their angular dimensions from the observed frequency of maximum of spectral distribution of flux density, ν_m , flux magnitude, $F(\nu_2)$, and spectral index α (ref. 2). The dependence on magnetic field, H , is negligible. The formula by Sligh assumes the form:

$$\nu_m = 1.2 \left[\frac{F(\nu_2)}{\theta^2} \cdot \nu_2^2 \cdot 10^{33} \right] \frac{1}{\alpha + 2.5} \cdot H^{\frac{1}{2\alpha+5}} (1 + Z)^{\frac{1}{2\alpha+5}} \quad (1)$$

where θ = angular dimension of the source $\nu_2 > \nu_m$; $Z = \frac{\Delta\lambda}{\lambda}$ — red shift. For $\nu < \nu_m$, $F(\nu) \propto \nu^{2.5}$. Applying formula (1) to source 1934–63, for which $\alpha_{\nu > \nu_m} = 0.1$, yields peculiarly small angular dimensions: $\theta = 0''.005$.

Such small angular dimensions justify the assumption that the linear dimensions of this relatively strong source are likewise small. Even if the distance to the source $R = 3 \times 10^9$ parsec, its radius $r \sim 20$ parsec or 10^{20} cm.

Proceeding from the present general conception of the nature of radiogalaxies (cf. ref. 3), it may be assumed that we are here dealing with magnetized clouds of relativistic particles moving at a speed close to that of light, which for some reason are ejected from spatially small regions (for example, galactic nuclei). In the course of this movement the clouds expand, the magnetic field in them decreases, and the power of radio emission diminishes. Earlier we had developed⁴ the theory of secular diminution of the flux of radio emission, as applied to the source of Cassiopeia A, and the predicted effect of secular diminution was discovered as a result of observations specially undertaken for this purpose (cf. ref. 5). According to my earlier work⁴ the secular diminution of the radio emission flux is given by the expression:

$$F(r) \propto r^{-2(2\alpha+1)} \quad (2)$$

Proceeding from the linear dimensions of source 1934–63 given by formula (1) and from the conception of the nature of such objects considered above we may draw the conclusion that its 'age' is scarcely more than a hundred years (what we mean by 'age' is the time lapse since the cloud of relativistic particles was ejected). If so, the linear and, therefore, the angular dimensions of source 1934–63 should also change rather quickly. For this reason both $F(r)$ and ν_m will change. It may be easily demonstrated that the latter value changes with increasing r according to the law:

$$\nu_m \propto r^{-\frac{4\alpha+5}{\alpha+2.5}} \quad (3)$$

Here we have accepted an assumption that $H \propto r^{-2}$. Because the ejected clouds apparently are not retarded by the environment, but move with simultaneous expansion at a constant velocity close to C , in formulae (2) and (3) the dependence of F and ν_m on r may be substituted by a similar dependence on time, t . The annual variation of F and ν_m will be: