APPENDIX IV

Hydrogen as a Star

Stars are ionized. They comprise hydrogen atoms. They have sufficient mass for the force of gravity to squeeze those atoms close together. Their K-level electrons then crash into the electrons of adjacent atoms and so sustain the ionization. As a result the nucleus of the hydrogen atom, the proton, the seat of most of the mass present, can come free and be pulled inwards towards the centre of the star owing to gravity. The result is equilibrium when the electrostatic repulsion of the many protons involved balances the mutual gravitational attraction, not of those protons, but of the full atomic composition of the star that lies within the pressure threshold set by the critical contact between those electrons in the K-level of the atomic structure.

The radius of the K-level electron orbits in hydrogen is known to be 5.292×10^{-9} cm and so, once the pressure reduces the distance between the nuclei of the adjacent hydrogen atoms to 1.0584×10^{-9} cm, then one can expect the ionization state, as produced by gravitational action and so the dynamic activity of the aether which accounts for that action, to develop in such a way as to give basis for the following formula relating charge density σ_s and mass density ρ_m in the star:

$$\sigma_s = \rho_m (G)^{1/2}$$

This is equation (8.12) in chapter 8. Our object here in this Appendix IV is to determine that mass density for hydrogen atoms having contact between their K-level electron orbits. For a simple cubic array of such atoms there is one hydrogen atom in every unit volume defined by the cube of that distance 1.0584×10^{-9} cm and, since a hydrogen atom has a mass of 1.67×10^{-24} gm, this corresponds to a mass density of 1.41 gm/cc. This happens to be the mean mass density of the Sun.

However, we need to justify that simple cubic structure, because most physicists will suggest that some close packing of the kind known to crystallographers will be more likely. To answer this I draw attention to the fact that our analysis of aether structure has already relied on a simple cubic structure of those quons that form the E frame of the aether. The reason there was that the quons repelled one another and sought to be as far apart as possible. The same could apply to hydrogen atoms squeezed close together, because each of those protons sitting at the atom's centre is screened by a single electron. This means that the protons, though 100% screened electrostatically, on average, will sporadically be exposed in the sense that they will, as it were, see the charge of the adjacent protons. In finding the optimum 'crystal' structure they will, like the quons in the aether, then opt for the simple cubic array.

That is my case in support of the argument that hydrogen stars will have a mean mass density of 1.41 gm/cc and the one star we can be sure about in determining its mass density is our sun, which has exactly that mass density of 1.41 gm/cc.