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The Nuclear Aether

The physics of the aether is to many minds the physics of the nineteenth century. The twentieth century has so far been concerned with the physics of the atom and its quantum behaviour. Physics has assumed importance in industry primarily because electrical technology in the semiconductor field has become the province of the physicist rather than the electrical engineer. Also, physics has now an undeniable place of importance because everyone is all too aware of the energy hidden inside the atomic nucleus. For this reason the minds of many research physicists are technology-orientated. Theoretical physics is complicated, the aether is dead and who has the time anyway to be concerned with such an antiquated topic! The more open-minded may say that if the aether has a place it is in cosmology; it is certainly not in the field of the nucleus. But let us see if we can dispel this belief.

Is there anything about the atomic nucleus we cannot explain? The atomic mass does not increment in proportion to the atomic charge. It seems that over a range of atoms of low atomic mass the number of nucleons is approximately twice that of the number of proton charge units in the nucleus. The nucleons comprise the protons and neutrons believed to form the nucleus. At high mass numbers the ratio of two increases roughly to about two and a half. An explanation of this would help our understanding of nuclear physics. Does the reader already have such an explanation? If not, perhaps the following analysis will have some appeal.

Consider an electric charge surrounded by a concentric uniform spherical distribution of discrete charges of opposite polarity. Now calculate the electrostatic interaction energy of such a system. This quantity will be found to be negative until

the spherical charge distribution has a charge exactly double the magnitude of the central charge. Thereafter we would have positive interaction energy signifying instability, because the 'binding' energy associated with the negative polarity has ceased to 'bind'. We may expect, therefore, an entity to form as a stable aggregation in which the central charge acquires an enveloping double charge of opposite polarity, assuming the spherical distribution. If we consider instead a central charge with a uniform spatial charge distribution surrounding it, bounded by a sphere, then instability sets in when the surrounding charge is two and a half times that of the core. Between these two limiting examples, we could have, say, charge distributed in two concentric shells of unit and double unit radius, the charge content being proportional to the area of the spherical shell form. This gives a ratio of 2·166 for stability.

It needs little imagination to recognize the relevance of this to our nuclear problem. The atomic mass number is a measure of the number of negative nucleons clustered around a central core of charge. This charge has negligible mass compared with the nucleon mass contribution but the charge is the positive charge we regularly associate with the atomic nucleus. We need not speak of a combination of neutrons and protons to explain qualitatively the numerical difference between atomic number and atomic mass number. Somehow the charges of the nucleons are not detected, because we well know that the atomic electrons only react to the central charge. They ignore the nucleon charges just as they ignore charges in the aether medium. Indeed, the electrons may see these nucleon charges as they see the aether. In fact, the nucleons may be deemed to be arrayed in a structure and to have displaced negative aether charge so as to substitute themselves in the structured form of the aether itself. Their charge is undetected just as the mass of a buoyant body goes undetected in a fluid of equal mass density.

Hence, we need to invoke our aether. Also, we see support for the cubic lattice distribution of aether charge. An oxygen nucleus can be adequately populated by a single shell of discrete charges. There are 26 charges disposed in a regular cubic system about a central charge and 16 of these are presumably replaced

by negative nucleons. The two to one ratio applies, because the oxygen atom has a atomic number of 8. Now take chromium, for example, which has an atomic number of 24. Here, we might expect charge to be distributed over another shell as well. The stability condition, calculated for idealized spherical distributions, requires 2·166 times as many nucleons as units of central charge. Hence an atomic mass number of 52, as is found. Similarly, for heavier atoms we find an appropriate relation between the two quantities conforming with this theory.

It has to be accepted from this that the nucleus consists of a central charge surrounded by a cluster of regularly spaced nucleons of negative charge. As the author has explained in his book *Physics without Einstein*, the nucleons form into a lattice structure with bonds joining the nucleons and, additionally, pions contributing to the energy of the bonds also derive their energy from an interaction with the nucleons. These features of the nucleus modify the mass and add some complication. Different isotopic forms may depend upon alternative structure configurations rendered possible by the different bond positions available. This is a matter for further analysis. When the above-mentioned book was published the author supposed the nucleons to be formed as a system of neutrons and protons, as is conventional. The later realization of the stable charge system introduced in this chapter, however, has led to a revision of the model. All the nucleons are the same. They are negative particles of mass approximating that of the proton.

The central charge itself is the conventional nuclear charge of the atom but it has relatively small mass. The physical size of this charge has been measured by experiment. It is approximately the size of the electron or positron multiplied by the atomic number, as if, for example, the oxygen atom has a charged core formed by the merging of 8 positrons which conserve their charge within their aggregate volume. The formation of different atoms can then be understood as a process by which a positron core is successively made larger by combination with other cores. The conservation of charge is to be expected, but the conservation of volume implies the presence of an enveloping incompressible fluid, again evidencing the need

for an aether medium. The existence of the charged core in a highly energetic environment permeated by heavy negative particles forms a nucleus. The charge has an affinity for heavy particles because they do have their own mutual gravitational attraction and this makes their association more stable. Also the higher the mass of the elements the less sensitive the system to spurious disturbances from light bodies such as electrons. Given the charge quantity at the central core, the nucleus forms to assure the stability criteria discussed earlier in this chapter. There is a limit on the size of the central charge. This charge itself has mass which will increase more than in direct proportion with the charge. Thus, the charge of a uranium core may have its own mass of nearly 2,000 times that of the positron, even though its charge is only 92 times that of this particle. Also, there is a limit on the spatial extent of the nucleon lattice. This reaches the innermost electron shell of the atom when the atomic number is of the order of 40. However, this latter effect may not be relevant because the nucleons are hidden in the charge pattern of the aether. It would seem, therefore, more likely that it is the mass of the central charge core which governs the stability of the heavy nuclei.

Before concluding the chapter some comment about the conservation of charge volume is appropriate. If discrete charges exist in a surrounding pressurized but incompressible medium they will adapt in shape to be spherical. This is assured by the self-repulsion of their intrinsic electric charge. Also, the charge will be distributed within the bounding sphere so that a uniform pressure exists within the body of the charge. The electric energy thus stored by the charge is inversely proportional to its radius. A question of stability arises, particularly as charges of different sizes may exist. To answer this, we can say that, due to the uniform nature of the enveloping medium, if one charge expands another must contract, and yet, energy must be conserved. There can be equilibrium in this exchange relationship and so stability in the charge forms. The energy conservation condition will act to assure that charges of different size do not exchange any of the space they occupy. They will remain mutually stable under normal conditions. The energy criterion

is primary to any force action. Nevertheless, the charges will tend to form into families of equal charge and equal sizes or energies. Somehow, nature determines certain possible forms of particles and these forms then prevail to exclude any hybrid varieties which form transiently.

This argument also permits us to understand how charges in the aether might vary in size to change their mass. The author believes that gravitation is due to a modification of mass of certain aether particles. The idea is that there is a cyclic motion of matter with a lattice formed by aether charge and a counter-balancing effect due to motion of other aether charge. The aether adapts to balance the mass of matter present. The balancing charges of highest mass react and become very slightly smaller, so increasing their mass and causing a very small electromagnetic effect which explains gravitation.

Should a reader have difficulty understanding how a particle of charge can be stable and yet vary in size to accommodate kinetic energy as a change of its electric energy also corresponding to its change in mass, he should ask himself a question. How can a charge expand to release kinetic energy to itself when such energy is stored by its contraction? A charge will exchange energy with other charge, but stability amongst families of identical charges is assured by the mutual balance.