

luminous, which has frequently been observed around unknown objects). As for the magnetic field, it can be created as it is for boats.. However, propulsion is much more difficult to achieve in air, since, in that case, it must not only propel the aircraft but first of all compensate for its weight. The electrical and magnetic fields required are therefore much stronger than for a naval ship and, in practice, obtaining the very strong fields that are essential is scarcely conceivable without having recourse to superconductive wirings. Still theoretical until a only few years ago, their use in an aerial vehicle has been a credible prospect since 1991, with the discovery of superconductors capable of operating at near-ambient temperatures.

Propulsion in the atmosphere without propellers or jet engines is, therefore, completely possible in principle with MHD, and the calculations show that the power necessary is not, in certain cases, incompatible with our current aeronautical engines. The fact that no cooling system has been seen (or heard) on the objects that have been observed close up can be explained as long as the length of the craft's flights does not exceed a few dozen minutes. Furthermore, other motors that we already use - electric motors, from energy stored onboard or flywheels if they are not yet powerful enough - would not need immediate cooling, which duly proves that this problem is not insurmountable.

Numerous witnesses have been struck by the silence accompanying the maneuvers of the objects, which do not create a "bang" even at supersonic speeds (cf. Part 1, Chapters 1, 2, and 3). MHD propulsion could account for this silence: preliminary experiments in noise reduction by eliminating the wake and shock wave, albeit under very special conditions, are encouraging.

There has been extensive work on the different aspects of MHD propulsion of aircraft abroad: in the United States at Rensselaer Polytechnic Institute in Troy (NY), and according to the journal *New Scientist* (February 1996), in Great Britain and in Russia.

To sum up, based on the current state of our knowledge, an MHD aircraft model is conceivable in the short term, while the creation of a craft having the same movement capabilities as the aerial vehicles described by the witnesses seems quite likely to us within a few dozen years. For the time being, only the quasi absence of perceptible air flow and noise while hovering close to the ground pose problems.

8.1.1.2 Other Propulsion Methods

In a vacuum, the absence or scarcity of molecules or atoms prevents current flow in the medium as well as the projection of a mass of sufficient substance pulled from this medium. MHD propulsion is therefore not possible, and it is necessary to formulate other hypotheses. Jet propulsion by means of chemical reactions, comparable to our rocket engines - even though its performance is more advanced - should not be ruled out *a priori*. In fact, the space phase of the travel of unknown objects takes place very far from sight.

In addition, skins for stealth purposes render them invisible to telescopes and radars beyond a few kilometers or a few dozen kilometers. Consequently, at these distances, these objects could very well use classic propulsion systems without being detected. Mainly, then, problems with respect to power consumption and mass to be expelled are raised, but the method reviewed below in 8.1.1.3 would enable these problems to be partially solved.

More advanced technologically are propulsion systems that call for very high velocity exhaust - a considerable fraction of the speed of light - of particle beams. Due to the