

The following is an extract from the lecture given by Admiral Sir Anthony Griffin to the Maritime Division of the Southampton Institute, Warsash, UK as part of the symposium on the Impact of New technology on the Marine Industries, September 1993.

## *Water As Fuel*

### **ABSTRACT**

The earth's main sources of non-solar energy are fossil fuels, which cause severe pollution and cannot last indefinitely; nuclear, which is capital intensive, and whose waste disposal is problematical; tidal and wind schemes which are inefficient; and thermal and hydro installations which are efficient but lack flexibility and require major capital investment.

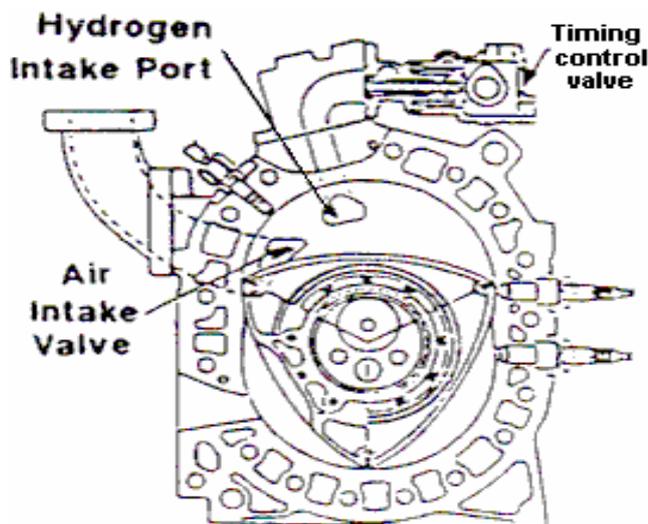
An alternative is water (salt, fresh or distilled) as a cheap and inexhaustible source of global energy which has none of the foregoing disadvantages. The theoretical evidence in support of the relevant technology is briefly described and related to the first and second laws of thermodynamics. Practical evidence is illustrated and the impact of this revolutionary development on the marine industries, with ships floating on their own fuel and thus having no need for either bunkers or ambient air, is indicated.

Much wider and global implications for the environment, industry, defence and political stability are discussed.

### **INTRODUCTION**

In 1972, the Royal Navy examined how the Fleet should be fuelled when current fossil fuels become too scarce, say in the year 2030. They concluded that the fuel of the future was hydrogen but since the gas was not normally available in usable form, it would have to be extracted through either electrolysis of water or nuclear fusion. Neither appeared to be immediately practicable. Electrolysis needed more power than that of the hydrogen it yielded and was too slow a process to meet the demands of an internal combustion engine. This meant that it would have to be stored in either liquid form or in a fuel cell, both of which involved substantial weight or safety problems. Nuclear fusion appeared to be too distant and expensive an alternative.

This position remains the current generally accepted view of hydrogen as a fuel. It has not however, deterred numerous investors from producing, for example, over 100 hydrogen fuelled cars in the USA, at least 12 in Germany and 3 in the UK. The latest is Japan's Mazda HRX car and its Wankel engine shown here.



This car was described in June 1992 to the 9th World hydrogen Energy conference in Paris. Here the papers referred only to various aspects of hydrogen generation through electrolysis, or its storage or its subsequent application. It is worth recalling that in April 1988, the starboard engine of a three-engined Tupolev 255 airliner was modified to run on hydrogen which was seen to be embarked in liquid form from a fuel bowser. The aircraft flew for about twenty minutes on its hydrogen powered engine which showed no exhaust except a trail of water vapour. The main attraction in all of these cases has been the absence of pollution at the scene of action. However, the pollution problem has merely been transferred to the source of the power required to drive the electrolytic process.

## **PRACTICAL DEMONSTRATIONS**

Many practical demonstrations of Water Fuel Cell technology have already been made and more are planned. Most of Meyer's patents were filed under a particular clause of the US Patent Regulations which requires a claim to be demonstrated before it can be granted.

### **The 1980 Patent**

The first and probably the most frequently demonstrated patent is based on the actual equipment used in 1980 to support Meyer's claim for his hydrogen fracturing process. I have now personally witnessed it 4 times.

In outline, the apparatus consists of 9 concentric stainless steel cylinders, with about a 1 mm gap between them. They are 14 inches long and are effectively waveguides. They are immersed in tap water contained in a glass vessel. The top of the vessel is normally gas tight but has a pressure gauge and a valve to allow gas to pass to atmosphere when required.

Electrical power with opposite polarities is applied in pulses to the inner and outer cylinders and at a power of 10 watts, i.e. 5 volts at 2 amps. A considerable quantity of gas immediately accumulates in the top of the vessel and, within 10 seconds, reaches a pressure of about 10 pounds per square inch.

When the valve is opened, a jet of cold gas can be felt, but on this being lit with a match, the temperature instantly rises to about 3000<sup>0</sup>F and the flame burns through a stainless steel wire in about 2 seconds. The glass vessel and its attachments remain at room temperature throughout, thus ruling out any normal electrolytic process. Plainly, the generation of such a quantity of gas and its immediate application at such a high temperature, demands more than 10 watts of electrical energy. Furthermore, as the stainless steel cylinders have not noticeably been consumed over several years, the balance of the energy required can only come from the zero-point energy in the water. Meyer points out that all the parameters involved in this demonstration have been deliberately de-optimised, e.g. 5 volts instead of 20,000 volts and 2 amps instead of 0.5 milliamp, 14 inch tubes instead of an optimum of 27 inch tubes, etc. in order to allow the principle of the water fracturing process to be demonstrated without risk of explosion.

### **The 1985 Dune Buggy**

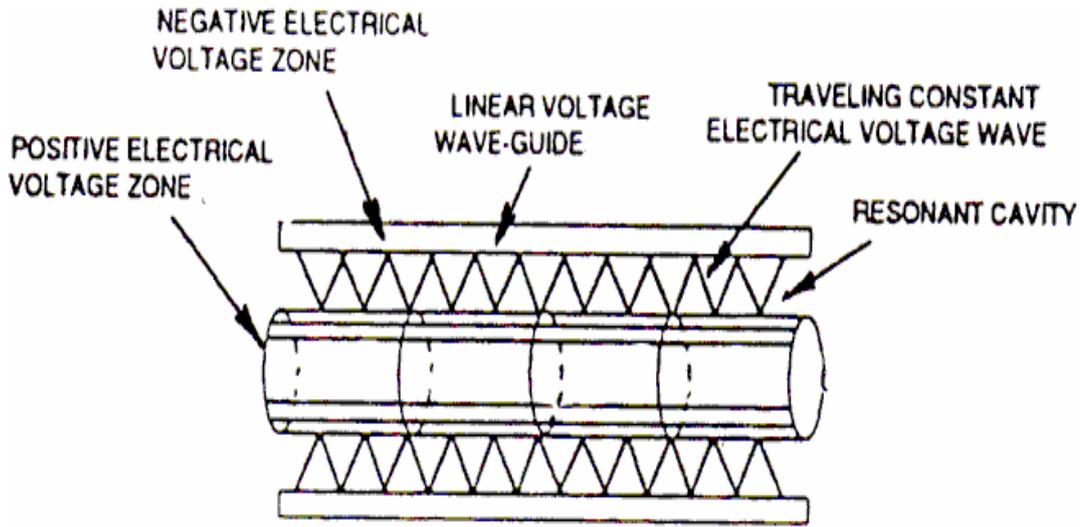
In 1985, a dune buggy powered by a standard 1600 cc Volkswagen engine was modified through Water Fuel Cell technology to run on water fuel. It was a breadboard quality experiment which was successfully demonstrated as broadcast on American TV and reported in the press. A video tape record is held by London University.

### **The 1993 Dune Buggy**

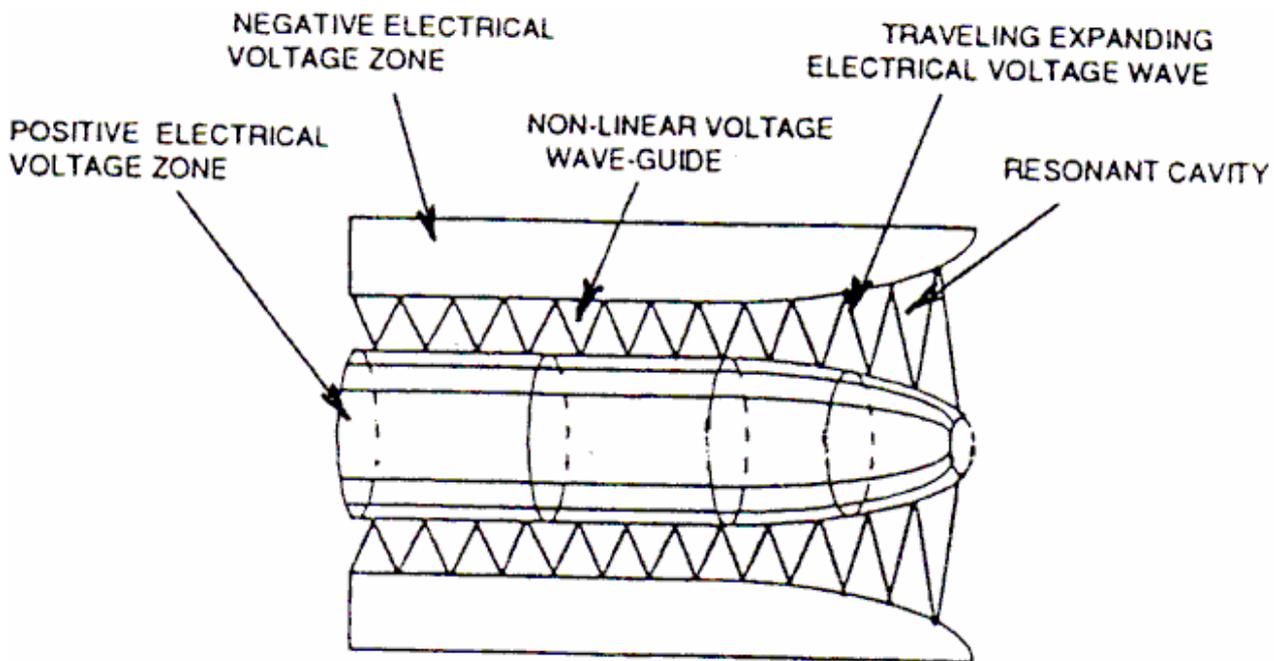
This will be the first demonstration of a complete system, manufactured to a pre-production standard as a conversion kit for a typical car. The rig is designed for powers up to 400 hp and, in production, Meyer expects to market it for \$1500. The date has yet to be settled, but is expected to be within the next 2 months in Ohio.

### The *Hyperdrive* Portable Demonstrator

This project is under consideration as a convenient means of demonstrating how zero-point energy can impel water without any moving parts as shown here.

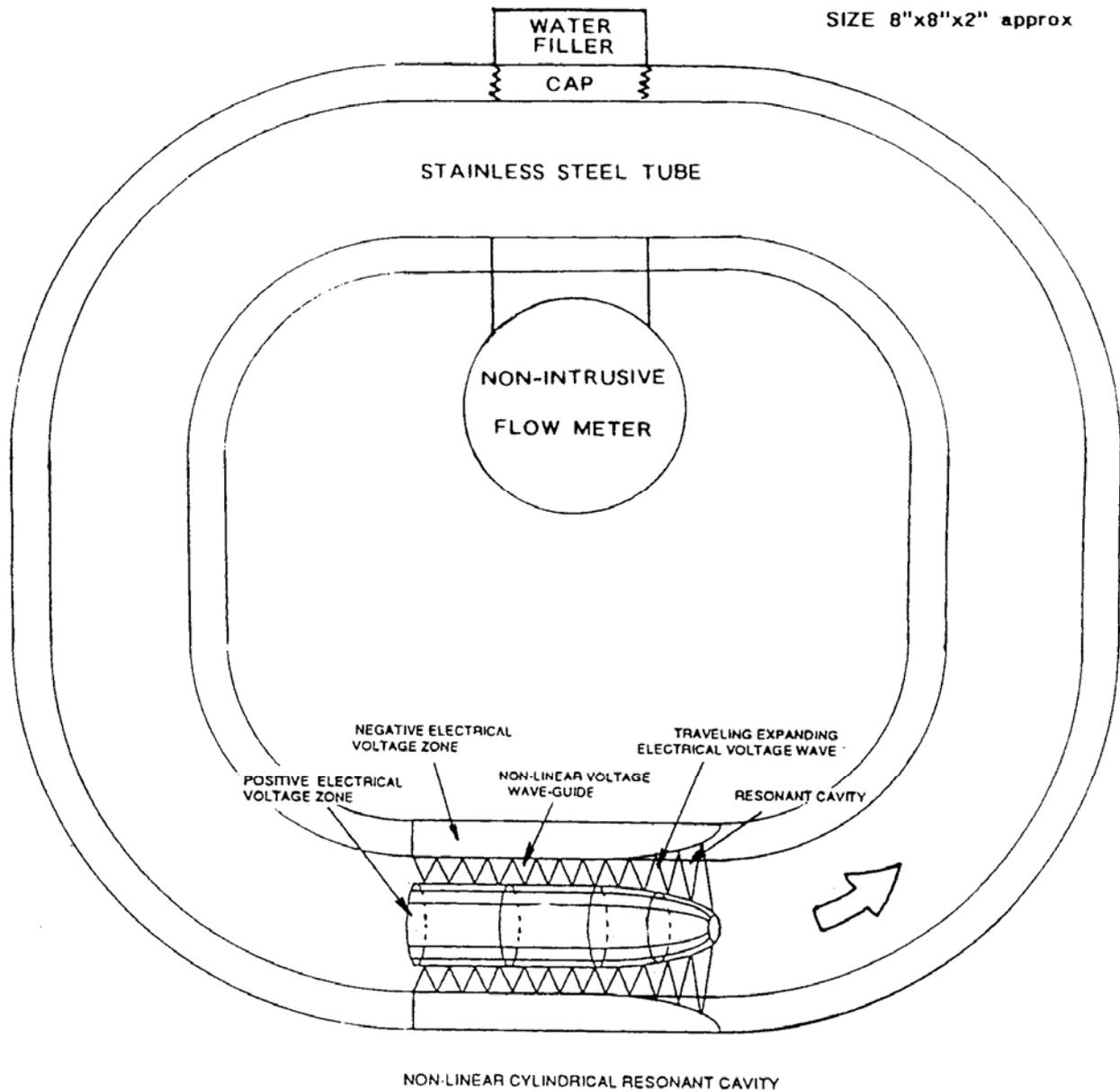


LINEAR CYLINDRICAL RESONANT CAVITY



NON-LINEAR CYLINDRICAL RESONANT CAVITY

# HYPERDRIVE ZPE IMPELLED WATER DEMONSTRATOR

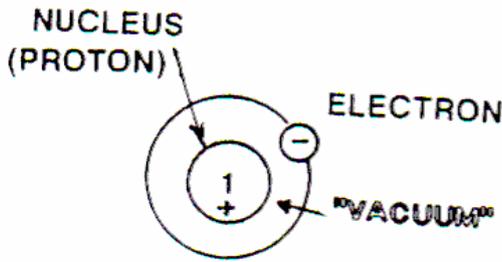


## ASSOCIATED EQUIPMENT

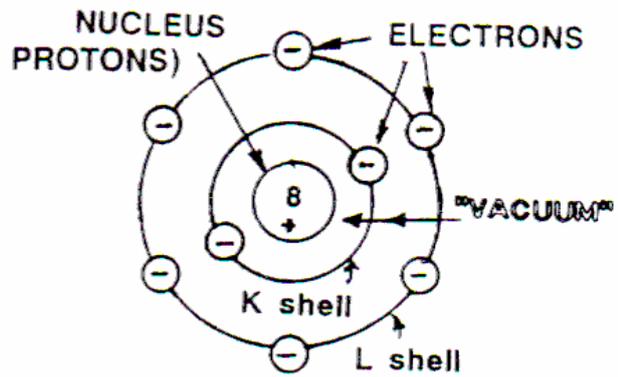
VOLTAGE INTENSIFIER CIRCUIT  
ELECTRON EXTRACTION CIRCUIT  
2 6VOLT BATTERIES

## THE THEORY OF WATER FUEL CELL TECHNOLOGY

This begins with the basic structures of hydrogen and oxygen atoms and how they are combined in the water molecule.

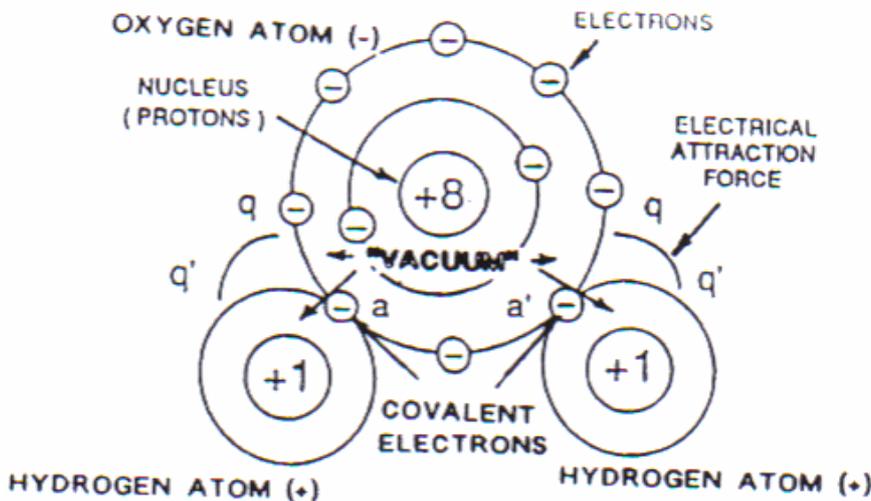


**Figure 5. The Hydrogen Atom**



**Figure 6. The Oxygen Atom**

Note the orbital paths of the electrons and their 'shells'; the magnetic polarity of an electron and a nucleus; and the space occupied by the so-called vacuum.



**Figure 7. The Water Molecule**

Note the presence of the two hydrogen electrons in the 'L' shell of the oxygen atom. These are known as the covalent electrons which are bonded in position by considerable electrical force. In the case of normal electrolysis, the energy needed to break these bonds and produce separate hydrogen and oxygen atoms from water, is roughly three times the energy of the hydrogen released. It is thus a highly inefficient process because of the considerable amount of waste heat which is generated.

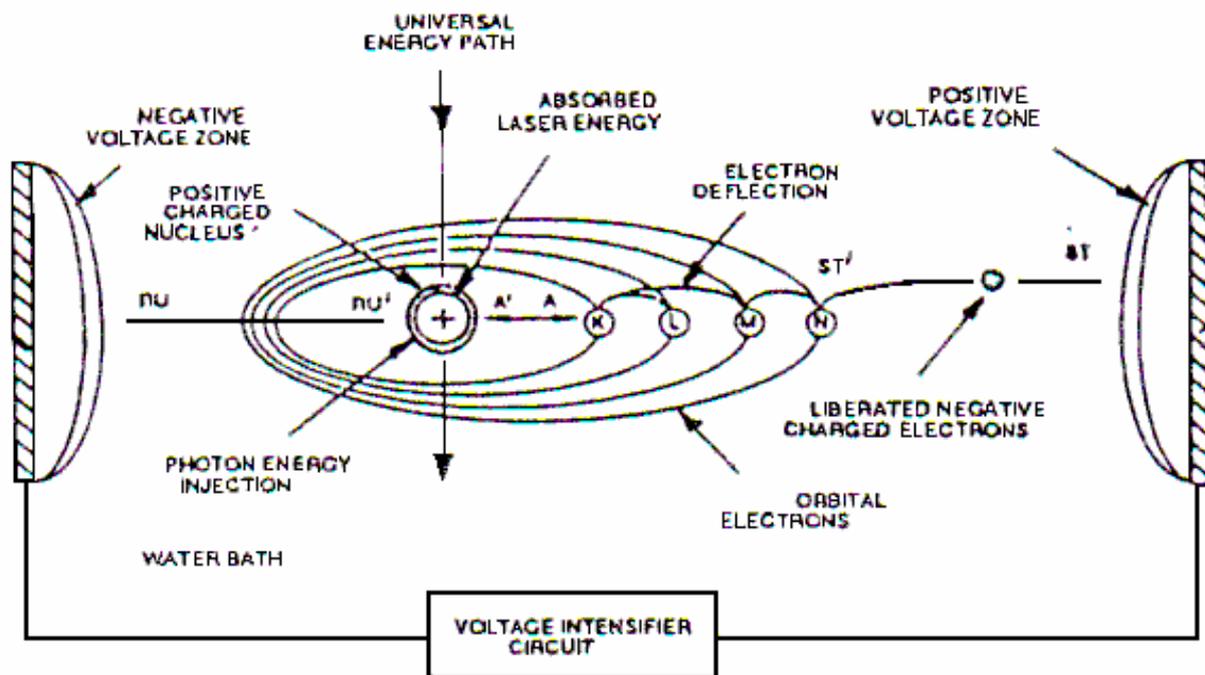
The energy extracted from water by the Water Fuel Cell derives from two distinct, but virtually simultaneous processes. The first is the hydrogen fracturing process which dissociates the hydrogen gas from the water molecule. The second is the electron ionisation process which enhances the explosive energy of the gases released.

### THE HYDROGEN FRACTURING PROCESS

The basis of this process is the subjection of the water molecule to very high voltage (20,000+) pulses at a particular frequency and within positively and negatively charged voltage zones at a very low current of less than 1 milliamp.

The effect is to attract the negatively charged electrons towards the positive voltage zone and the positively charged nucleus towards the negative zone. The electron orbital path is changed from a circle to an ellipse and this, coupled with the effect of pulsing, causes such electrical stress on the molecule that the covalent bonds between the hydrogen and oxygen atoms are broken and the two gases separated. Thereafter, they

require substantial energy to be applied before they can be recombined. Because the current is so low, very little heat is generated. It is worth noting that, weight for weight, hydrogen contains about 2.5 times the energy of gasoline and the latent energy in the hydrogen content of a pint of water amounts to over 9 million joules, or enough to run a 1KW heater for 2.5 hours.



**Figure 8. The Hydrogen Fracturing Process**

### EXPLOSIVE ENERGY ENHANCEMENT

Two distinct questions arise over explosive energy enhancement. First, where does the additional energy come from? And second, how is it to be obtained and controlled?

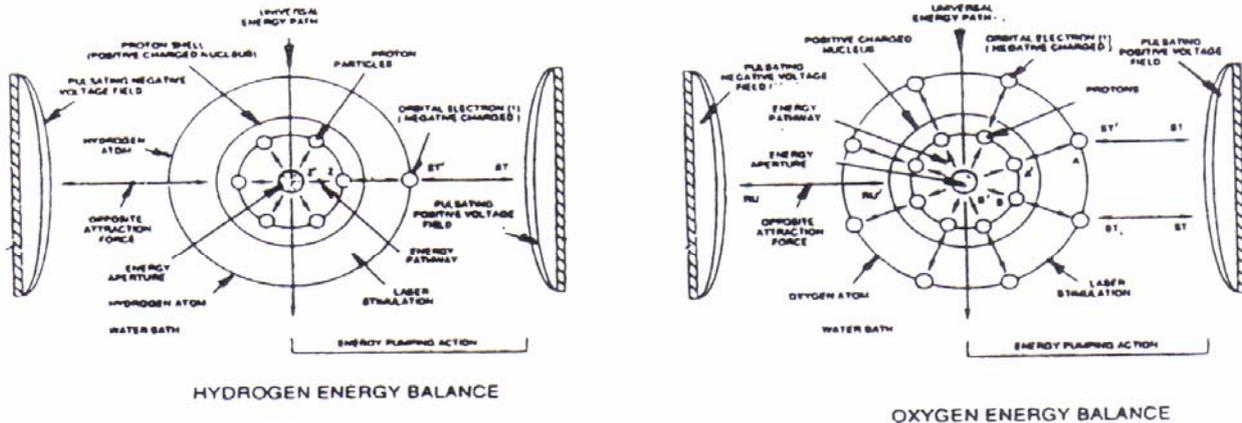
The answer to the first question is the so-called vacuum within the electron shells. For many years this vacuum was regarded as a void. But James Clerk Maxwell, in his 'treatise on Electricity and Magnetism' published in 1873, pointed out (vol 2 pages 472 and 473) that the vacuum in fact contains a considerable amount of energy. Subsequent work bears this out and it is now generally accepted that the vacuum is in fact seething with energy which has variously described as, for example, 'universal energy', 'gravity field energy', or 'zero-point energy'. John Archibald Wheeler of Princeton university, a leading physicist who worked on the US atomic bomb project, has calculated that the flux density of zero-point energy is of the order of  $10^{93}$  grams per  $\text{cm}^3$ . It is also recognised that the state of this so-called "sea of energy" is chaotic. Hence it needs to be "engineered" or made coherent before it can be translated from a microscopic to a macroscopic state. In other words, it requires special treatment before it can be tapped and controlled for normal external use.

Various answers, mostly theoretical, have been given to the second question. recent examples include Ilya Prigogine's book 'Order Out of Chaos' which describes the work which won him the Nobel Prize for Chemistry in 1977, Moray B. King's 'Tapping the Zero-Point Energy', Dr. J. Huber's paper 'Phenomena of the Free Energy in Nature and technology', John Davidson's 'the Secret of the Creative Vacuum' and, from the Kansas State University, Gary L. Johnson's 'Electrically Induced Explosions in Water'. Some 30 supposedly practical devices have been made or suggested over the past 80 years, but although some have been demonstrated, none has been developed or engineered to a pre-production standard.

Meyer's Water Fuel Cell technology stands out as the only apparent exception. It has encountered deep scepticism but no argued rejection. Indeed, an increasing number of scientists and engineers in the USA, Europe and Asia, accept the technology and are prepared to invest in it on the basis of current evidence. A practical demonstration is in fact due to take place within the next few weeks, based on a fully designed system, engineered to a pre-production standard and fitted to a running 'dune buggy'.

The technical basis for Meyer's extraction and control of zero-point energy lies mainly in the effect produced on an atomic nucleus by continuation of the same high voltage pulsing that causes the dissociation of the water molecule. The nucleus consists of one or more positively charged protons bound together with a number of neutrally charged neutrons. The electrical effect of the electron pumping action mentioned earlier, causes an annulus to appear in the middle of the nucleus. The zero-point energy is drawn through the annulus in a helical motion and in so doing, becomes coherent and hence a usable source of energy. The voltage dictates the size of the annulus, and hence controls the energy obtained. Since the basic structure of the atom is retained, no alpha or gamma radiation occurs. The effect might be illustrated by a bath full of water. So long as the plug is in place, the water remains still and apparently powerless. However, when the plug is removed, the water swirls away with a helical motion down the plug hole and, under the influence of gravity, forms a powerful jet which can be directed to do work.

Meyer further stimulates the energy yield by injecting laser energy into the ionised water vapour. A diagram of the energy enhancement system is shown in Figure 9.



**Figure 9. Explosive Energy Enhancement**

The hydrogen fracturing process and the energy enhancement of the gas occurs almost simultaneously within the fuel injector. This, in an internal combustion petrol or diesel engine, replaces an existing spark plug or diesel fuel injector, and the output is ignited by a high voltage pulse on entry into the cylinder. Consequently, the hydrogen does not have to be stored and the fuel tanks of land or air vehicles contain nothing but water. Vessels floating on water need no fuel tanks. The system is thus not only extremely safe, but also inexpensive. Meyer has quoted the in-production cost of a conversion kit for a 1600 cc Volkswagen engined car as \$1500 (1993 \$ values).

### THE WATER FUEL CELL AND THE FIRST AND SECOND LAWS OF THERMODYNAMICS

The Water Fuel Cell technology encounters a credibility gap because it appears to run counter to the long established laws governing our interpretation of Nature. Some people therefore reject the Water Fuel Cell because it appears to be un-natural and just one more spurious claim for perpetual motion. In fact, the water Fuel Cell is entirely natural. It merely demonstrates a new and revolutionary way of harnessing what nature has always had on offer. It does not infringe the two main laws of thermodynamics, i.e.:

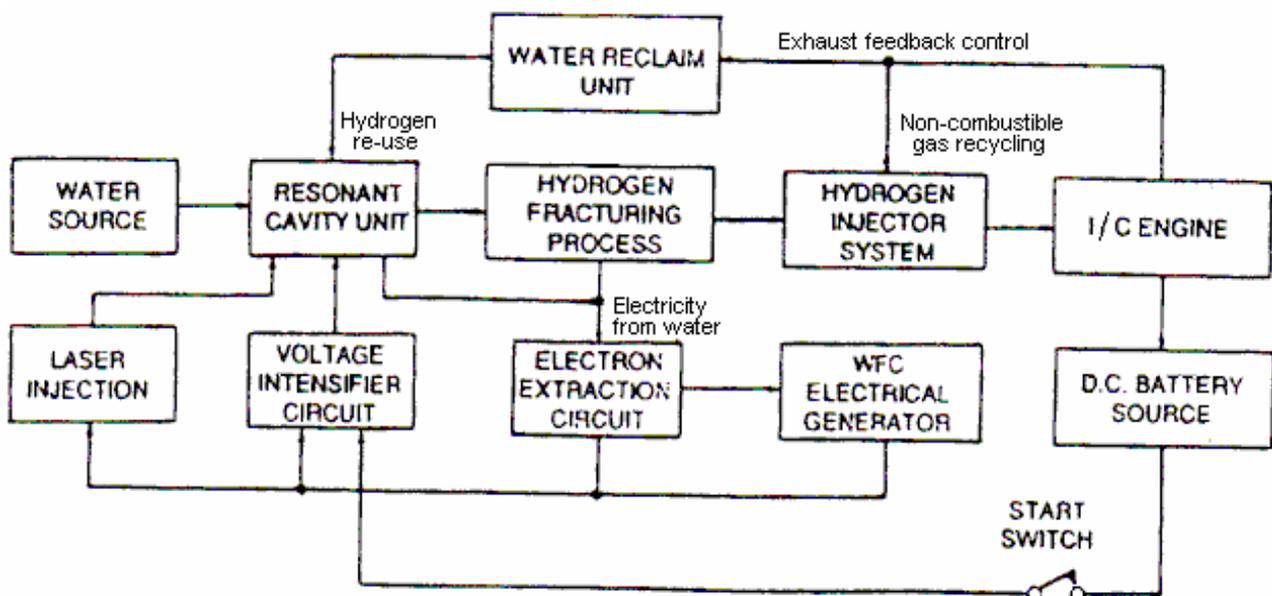
**THE FIRST LAW:** "The total energy of a thermodynamic system remains constant although it may be transformed from one form to another." In the case of Water Fuel Cell technology, the system is global. The

energy required to drive the engine comes from the zero-point energy contained in the water, a virtually inexhaustible source. The exhaust from the engine is water vapour which returns to the atmosphere.

**THE SECOND LAW:** As originally formulated by R. Clausius in 1865, this law states that "*The entropy of the World strives towards a maximum*". As recently formulated by Prigogine and Stengers, this law "contains two fundamental elements: (1) a negative one that expresses the impossibility of certain processes (e.g. heat flowing from a cold to a hot source) and (2) a positive, constructive one. It is the impossibility of certain processes that permits us to introduce a function, entropy, which increases uniformly and behaves as an attractor for isolated systems". It is at maximum when the system is in equilibrium. Non-equilibrium is the source of order and brings order out of chaos. Since Water Fuel Cell technology postulates non-equilibrium, it can be said to be supported by the positive element of this Law.

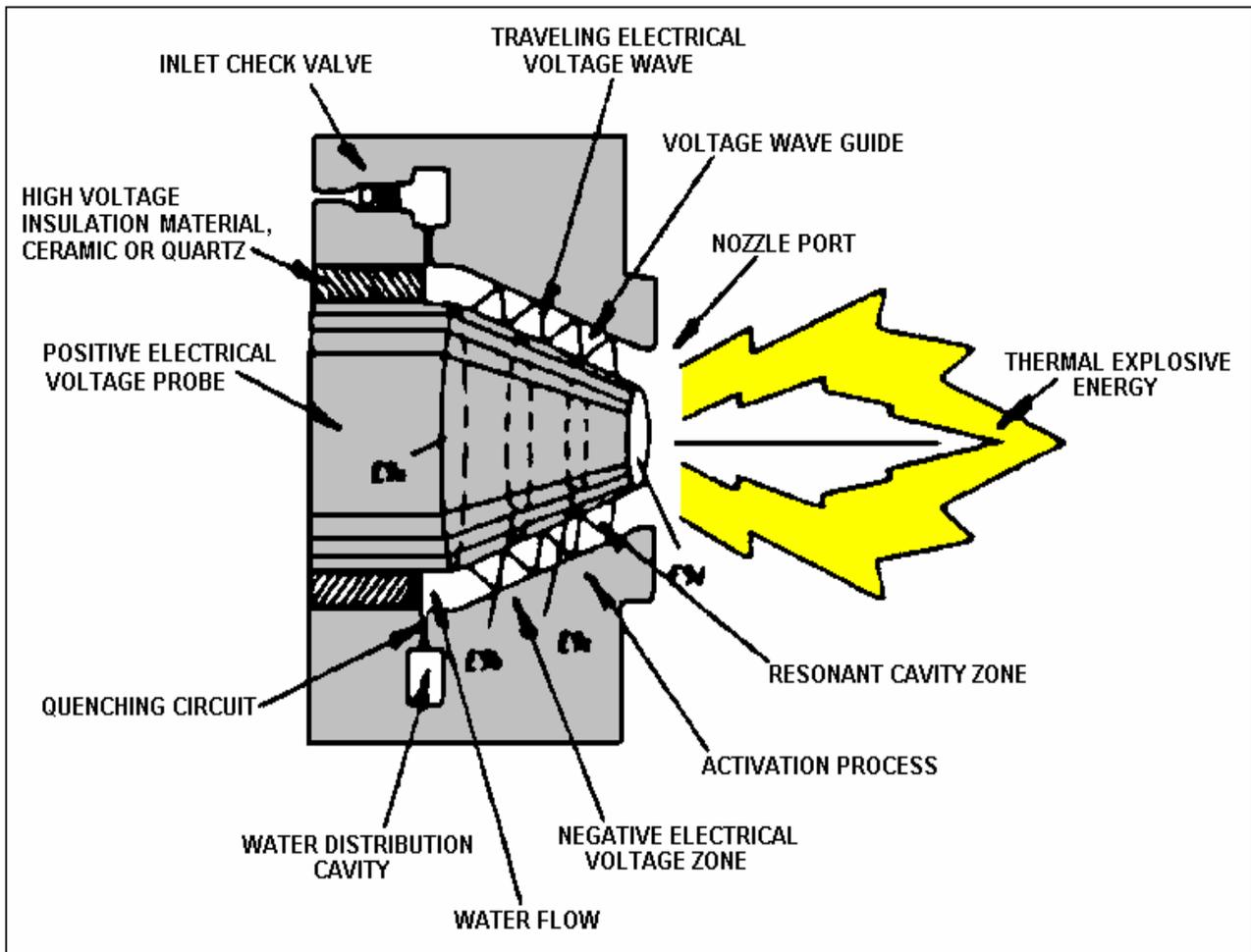
## THE VEHICLE SYSTEM

The system starts with a normal 12v car battery and a tank full of water (salt, fresh or distilled). Under computer control, the Voltage Intensifier Circuit is energised by the battery to generate high voltage pulses at a very low current, <1 milliamp, the voltage being responsive to the throttle. Simultaneously, water and ambient air are mixed into a water mist which is injected with laser energy and fed to each fuel injector. There it is subject to high voltage pulses which, virtually simultaneously, lead to the separation of the hydrogen and oxygen gases, and the explosive energy enhancement. A special high voltage pulse, applied at the exit of the fuel injector, ignites the gases as they enter the cylinder. The system is outlined in figure 10.



**Figure 10. WFC System Schematic for a Car**

**The Fuel Injector.** This highly innovative development accounts for the compactness of the vehicle conversion kit. It replaces the 'resonant cavity unit' which formed a relatively bulky and expensive component of the system as originally designed; eliminates the need for a special hydrogen conduit between the cavity unit and the fuel injection system; and reduces the variety of such systems by allowing any adjustments to be made through a newly designed universal computer. A schematic diagram is shown here:



## APPLICATIONS

**General.** In its current state of development, which is to a pre-production standard of engineering, the Water Fuel Cell technology can provide a safe, economical and pollution free source of universal energy for all internal combustion petrol or diesel engines of up to 400 horsepower. In addition, it can be readily adapted to gas turbines (both marine and aerial), to desalination plants, home heating boilers and industrial furnaces. A Dublin food processing company is now, with Irish Government support, manufacturing a water-fuelled furnace under licence from Meyer. When Water Fuel Cell technology reaches its full production stage, Meyer intends to market a range of conversion kits.

Given some conventional engineering development, Water Fuel Cell technology could be applied to very much higher powers, such as electricity generating plants (both fossil and nuclear fuelled), slow speed diesels, and space rockets.

In all these cases, energy would be in the form of hydrogen, obtained from the dissociation of water, coupled with zero-point energy itself through energy enhancement. Meanwhile, Meyer has a further development in hand which he calls "hyperdrive"

## HYPERDRIVE

This new development does not require the generation of hydrogen and its subsequent combustion. It applies the energy, made available electrically from high voltage pulsing of the zero-point energy field, directly to the generation of a water jet. It does not require an engine and has no moving parts. The power level is governed, as before, by the applied voltage. Direction is controlled by feeding the jet through manoeuvring nozzles such as those fitted to the Harrier vtol aircraft and to space rockets. It is therefore of special significance to marine transport.

## **AUTHOR'S BIOGRAPHY**

**Admiral Sir Anthony Griffin** was a regular executive officer in the Royal Navy for 42 years, the last 5 of which were spent as Controller of the Navy with responsibility for the development and construction of all new surface ships, submarines, aircraft and weapons. Retired from RN in 1975 to become first Chairman of British Shipbuilders from 1975 - 1980; President of the Royal Institution of Naval Architects 1981 - 1984, and founder member of the British Maritime League and the British Maritime Charitable Foundation in 1982.