# New Physics? The Wallace/Morgan Experiments

**By: Ernest McFarlane**

In 1971 and 1974, three rather remarkable patents were filed in the United States patent office by H. Wallace. (1), (2), (3). They were written up in great detail with painstakingly draughted diagrams of the embodiments of the inventions which were described therein. It was claimed that angular momentum was transferred from a rotating metallic body through space to another metallic body, in effect behaving as a field transmitted phenomenon. Wallace christened it a "Kinemassic Effect". He claimed that one of his inventions utilizing the phenomenon produced an anti-gravity effect.
He found further that the strength of the effect reduced with distance between the interacting bodies. Unfortunately the rather excessive verbosity of the description of his inventions makes it difficult to sort through the detail to his understanding of the underlying principles. Even so, very little actual quantitative detail was given. He suggested that it depended upon high-density materials with spin -1/2 nuclei and was not electronic in nature. The material of the rotating body was predominantly brass. It seems that little attention was paid to his patents or they were ignored as cranky, and there things remained until 1998, when Harvey Morgan (4) published results of experiments, which on the face of it, appeared to confirm Wallace's claims, although Morgan never referred to Wallace's prior work.

In Morgan’s work, a 2 lb lead flywheel was closely juxtaposed and aligned face-to-face to another unconnected flywheel. The parallel faces of the two flywheels were separated by 1/16 of an inch. When the lead flywheel was set rotating at approximately 26500 rpm, it caused the unconnected flywheel to commence rotating in the reverse sense. Unfortunately very little detail is given in the paper. The composition of the other flywheel was unspecified, and cannot be ascertained because Morgan is now deceased, and the experimental work was carried out privately. Morgan pronounced the phenomenon to be an angular momentum field effect and stated that it was not predicted by standard theory.

The paper was seized upon by the anti-gravity proponents as being extremely significant, and hailed as confirmation of Wallace's work which, as mentioned above, had anti-gravity overtones.

It has sometimes been linked to an effect predicted from special relativity theory known as the gravitomagnetic effect. However the gravitomagnetic effect is so extremely weak that it has not been measured in the laboratory. It is observable only in cosmological phenomena, and on the face of it, is far too weak to account for the Wallace/Morgan experiments. Hence the glamorous lure of New Physics. However despite this appeal, is it possible that standard physics has not yet been exhausted?

Indeed I believe that established theory, based on a semi-classical extension of the free electron theory of metals, can encompass these observations.

Consider the lead flywheel. The valence electrons fill up the closely spaced levels according to the Pauli principle, with two electrons of opposite spin in each. At absolute zero, filling occurs up to the Fermi level when all electrons are assigned, giving a sharp cut-off with all levels below the Fermi level filled and all levels above empty. As temperature is increased energy is gained by only those electrons in the immediate vicinity of the Fermi level, allowing unpairing to occur into unfilled levels. Only a small fraction of the total number of electrons (those within approximately kT of the Fermi energy) can thus gain energy. Note that the Fermi level energy is of the order of 50000 K. These electrons then enter higher levels unpaired, according to Hund's rule. They are thus able to exhibit a small degree of paramagnetism due to their associated spin angular momentum. The spin angular momentum vector is in the opposite sense to the magnetic dipole moment vector. Adopting a semi classical viewpoint, I will consider the electrons to be behaving as tiny gyroscopes while spinning about their axes. Although not a rigorous quantum mechanical treatment, it is well known that in many cases a classical treatment arrives at a virtually correct result. In the absence of an applied external magnetic field, the tiny electronic gyroscopes may be considered to be oriented randomly.
The macroscopic rotation applies a tangential force, via the lattice, producing a torque at right angles to both the gyroscopic vectors and the tangential force. Consequently the microscopic gyroscope vectors are forced out of their equilibrium state of random orientations towards alignment with the macroscopic angular momentum vector, with consequent increase of energy. Those gyroscopes within energy levels near the Fermi level are able to move into higher unfilled energy levels. This process continues as the macroscopic rotation increases, with more and more higher energy levels becoming singly occupied, in accordance with Hund's rule. Consequently so long as energy continues to be made available from power input to the lead flywheel, proportionately more unpaired spins become available at higher energies. Because the magnetic moment vector of an electron is directed oppositely to

the angular momentum vector, the magnetic moment builds up along the axis of macroscopic rotation, thus producing macroscopic magnetization by rotation. This effect was discovered by S. J. Barnett in 1915 (5) and is known as the Barnett Effect. The magnetic moment was indeed found to increase linearly with rotation rate. Barnett worked with rather moderate rotation speeds, around 3000 rpm, and reported a small but definite effect. Morgan's powered flywheel, on the other hand, was operated at about 26500 rpm, as noted above, so a proportionately larger effect would be expected. Furthermore, in the Morgan experiment, since the two flywheels were juxtaposed with their faces parallel and separated by only a distance of 1/16 of an inch, they presented a large surface area to each other. With this geometry the magnetic field generated in the powered flywheel is able to bridge the gap to induce a magnetic field in the other flywheel in a significant volume, producing alignment of unpaired spins in that wheel. Unfortunately since Morgan gave no details of the nature of the other flywheel, I have had to assume here that it was most likely made of a paramagnetic metallic material. It certainly looks like a machined metallic wheel in the photograph in the paper. As magnetic alignment occurs, spin angular momentum of the tiny gyroscopes is also produced, directed in the opposite sense. Since the total angular momentum (the sum of microscopic and macroscopic angular momentum) of the second flywheel must be conserved, and equal to zero, a macroscopic angular momentum of the second flywheel must be generated, equal and opposite to the gyroscopic angular momentum so produced. Thus the second flywheel must begin to rotate in the opposite sense to the powered flywheel, as is indeed observed.

Alternatively, the torque on the microscopic electronic magnetic dipoles induced by the magnetic field of the powered flywheel is seen by the spinning gyroscopes as a force acting towards alignment in the opposite sense to the induced magnetic field, i.e. as a force acting at right angles to the microscopic angular momentum vectors. This force will always be directed tangentially to the axis of the second flywheel, and in the opposite sense to the direction of rotation of the powered flywheel. It will thus be transmitted to the lattice of the second flywheel as a force causing macroscopic rotation of the flywheel in the opposite sense to that of the powered flywheel. Although not widely known, this phenomenon is generally referred to by those familiar with it, as the Einstein-de Haas effect, or rotation by magnetization, and was first studied experimentally by the two physicists in 1915 (6). Interestingly, it is seemingly the only experimental work to which Einstein's name is attached. However, more correctly it should be referred to as the Richardson effect, since it was

predicted earlier by O.W. Richardson in 1908 (7), although his priority was not acknowledged in the Einstein-de Haas paper.

Hence, if the above reasoning is correct, standard physics may still prevail, and the Morgan experiment may be merely the result of a back to back coupling of the Barnett effect and the Richardson (Einstein-de Haas) effect.

First published on the Web, November 10 2005

**References**


1. Wallace H. W., U.S. Patent # 3,626,605 (1971) *"Method & Apparatus for Generating a Secondary Gravitational Force Field"*
2. Wallace H. W., U.S. Patent # 3,626,606 (1971) *"Method & Apparatus for Generating a Dynamic Force Field"*
3. Wallace H. W., U.S. Patent # 3,823,570 (1974) *"Heat Pump"*
4. Morgan H., *"Now We Can Explore the Universe"* IEEE AES Systems Magazine, (January 1998) 5 –10
5. Barnett S. J., *"Magnetization by Rotation"* Physical Review 6/4 (1915) 239 – 270
6. Einstein A. und de Haas W. J., *"Experimenteller Nachweis der Ampereschen Molekularstrome"* Deutsche Physikalische Gesellschaft Verhandlungen, 17 (1915) 152 – 170
7. Richardson O. W., (1908) See reference 5.


This page is at:
http://www.users.bigpond.com/ernestmcfarlane/Wallace_Morgan.html