

# Can a layman understand?

*Crimestop means the faculty of stopping short, as though by instinct, at the threshold of any dangerous thought. It includes the power of not grasping analogies, of failing to perceive logical errors, of misunderstanding the simplest arguments if they are inimical to Ingsoc, and of being bored or repelled by any train of thought which is capable of leading in a heretical direction. Crimestop, in short, means protective stupidity.*

- G. Orwell, 1984, pub. Chancellor, 1984 edn., p225

Professional “scientists” have to keep within the canon, or dogma, in order to reassure the agencies which supply them with funds. Their careers and reputations require that they extend the existing knowledge within their expertise. They must no longer threaten it. If “The Catt Question” about the theory they teach causes professors to contradict each other, they must show solidarity by ignoring, or not understanding, the Question.

This has reached the absurd situation where laymen can (I hope) easily see the problem, but the “experts” cannot, or rather dare not. The emperor has no clothes.

I describe the situation as clearly and simply as I can. My neighbour pretends he is reading the beginning of my new book, below, and either understands the situation or not, and says so in writing. He then replies to my questions. He should not spend more than an hour on this.

### Battery and resistor. Steady state.

We start with a conventional view of a battery with voltage  $V$  connected via two uniform perfect conductors to a resistor  $R$  (Fig.1).

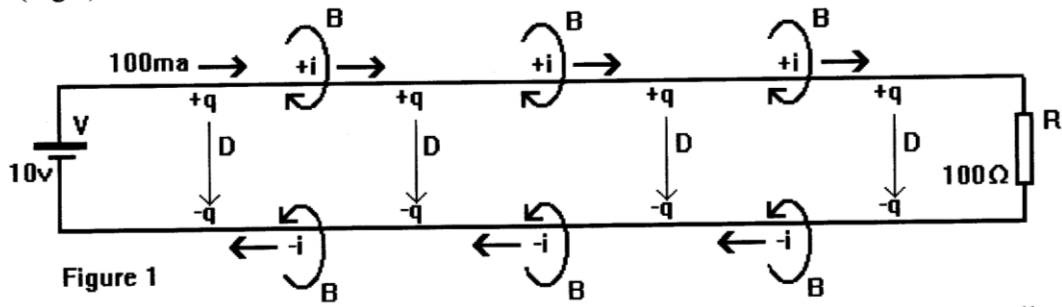
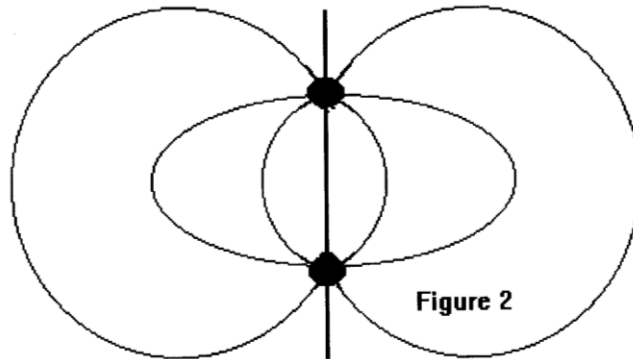


Figure 1

A steady current flows round the circuit, through battery, conductors and resistors. Ohm's Law tells us that the voltage equals the current multiplied by the resistance. Therefore the current is  $I = V/R$ . Every point on the surface of the upper conductor is at potential  $V$ , and every point on the surface of the lower conductor is at a zero potential.

The space between the two conductors, shown in cross section (Fig. 2), is filled by tubes of electric displacement  $D$ .



Each tube of electric displacement terminates on unit positive charge on the upper conductor and unit negative charge on the lower conductor  $\square$ . If the capacitance between the two conductors is  $C$ , then the total charge on each conductor is given by  $Q = CV$ . If the capacitance per unit length is  $c$ , then the total charge per unit length on each conductor is  $q = cV$ .

### Battery and resistor. Initial state.

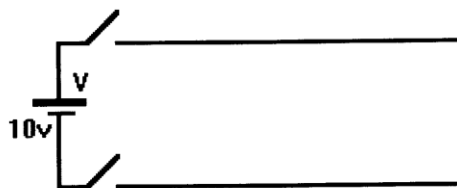


Figure 3

Now let us turn to the conventional view of the initial conditions. We will insert two switches, one in the top conductor and one in the bottom conductor (Fig.3). When we close the two switches, the distant resistor cannot define the current which rushes along the wires because the wave front has not yet reached the resistor (Figs.4,5).

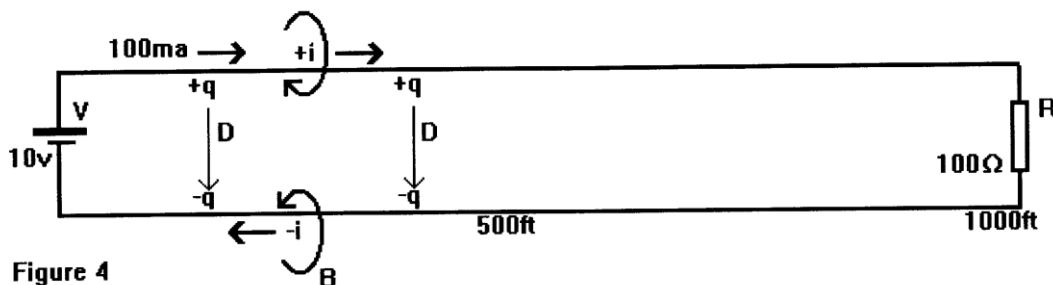
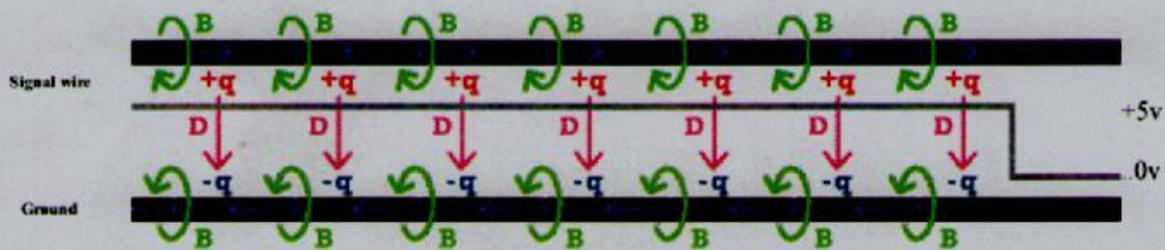
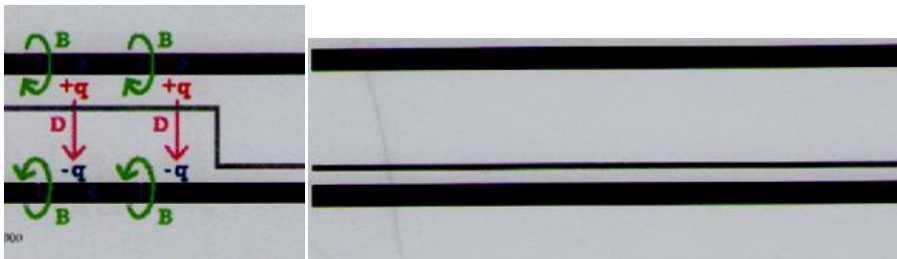


Figure 4

### Origin of "The Catt Question"

Traditionally, when a TEM step (i.e. logic transition from low to high) ( [Figures 3, 4, 5](#) from [Electromagnetism 1](#) ) travels through a vacuum from left to right, guided by two conductors (the signal line and the 0v line), there are four factors which make up the wave;

- electric current in the conductors  $i$
- magnetic field, or flux, surrounding the conductors  $B$
- electric charge on the surface of the conductors  $+q$ ,  $-q$
- electric field, or flux, in the vacuum terminating on the charge ( [Figure 2](#) ),  $D$



The key to grasping the question is to concentrate on the electric charge  $-q$  on the bottom conductor. The step advances one foot per nanosecond. Extra negative charge appears on the surface of the bottom conductor to terminate the new lines (tubes) of electric flux  $D$  ([figure 2](#)) which appear between the top (signal) conductor and the bottom conductor.

**Since 1982 the question has been: Where does this new charge come from?**

Sir Michael Pepper, Knighted "for services to Physics", says it comes from the south.

Nobel Prizewinner Professor Josephson say it comes from the west.

Accredited experts line up, half behind [Pepper](#) (Southerners) and half behind [Josephson](#) ( [Westerners](#) ).

[Professor Martin Rees](#), President of The Royal Society, may or may not do something about it.

The "southerner" says the negative charge  $-q$  comes from inside the bottom conductor, from the south.

The "westerner" says the negative charge  $-q$  comes from the battery, from the west.

## Questions.

Since accredited experts contradict each other, is it important that they discuss their disagreement, “southerner” and “westerner”, or at least tell their students that there is uncertainty as to what they are being taught?