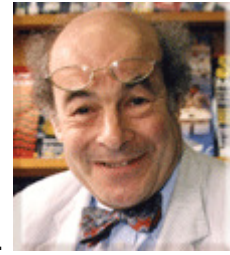


## Recycling small Batteries, a Problem in Human Motivation

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The explosion in the use of small electrical and electronic devices and toys, many of them carried about in pockets, has led to an considerable increase in the use of both primary batteries for single use only and small rechargeable batteries. Just to give an example of magnitude, there are more than 60 million mobile phones in the UK, each of which will contain a small rechargeable battery which sooner or later wears out.

I have just turned out my pockets and my briefcase, and I have a lithium primary battery in my watch, a lithium rechargeable battery in my mobile phone and another in my camera, three AAA batteries in an LED torch, a biggish lithium battery in my laptop and a rather special lithium battery in the Pacemaker in my chest. (I do not intend to recycle the last one for several years!)

***Batteries, other than large car batteries which have long been traded-in to recover the lead content and neutralise the acid, are currently only recycled to a very small extent by specialised firms. This is probably well below 4% of all batteries used in households.***

There are two major obstacles. The first is the small amount of batteries of any kind which the average family accumulates and usually there is no formal collection of the few tens of grams of material. The second is the variety of materials which are used to make pocket or even watch sized batteries work. Some examples of the material types consist of:

- zinc
- carbon
- graphite
- manganese dioxide
- nickel
- alkali solution
- lithium compounds
- cases made from steel
- and plastics of various kinds both for structure and insulation

### **With this in mind why would you want to recycle them?**

If disposed of in landfill, metals like zinc and nickel will in due course leach out and they are potential pollutants of water. The steel will rust away, but the rest of the materials are pretty harmless, of no great value and are not chemically active.

However, the materials in quantity, particularly the metals have a commercial value and recycling them may save energy. Zinc and lithium batteries could in principle be separated from the rest by distillation, because they have relatively low boiling points. Plastics are separated, when derived from larger batteries (like lead/ acid accumulators), by breaking them up into small pieces in hammer mills and using the

different densities when immersed in water, or perhaps a denser liquid, to separate the lighter plastic which will float to the top from the much heavier lead and other metals.

However, the real problem is that of collection. I have little doubt that the beard hair which I extract from my electric shaver every morning would ginger up any compost because of its high nitrogen content. However, how many people (if any?) actually add it to their Local Authority provided compost bin.

I happen to be working on a variety of schemes to allow frail elderly people to live in their own homes for longer. One of the insights this has led to is that in general there are a lot more people delivering things to houses than taking things away, or perhaps performing some service for the client whilst making contact.

Small rechargeable or primary batteries are in much the same position. One never has enough of them at any one time for even the most conscientious people to make a great effort.

As usual, the technology exists but it is the human factor which needs a little original thought.