

A 'Smith & Jones' Guide to Electronics

Roy Hawkey

Senior Lecturer in Science & Technology Education
University of Brighton

If you are still having difficulty digesting the New Year fare and the new Technology Order, Roy Hawkey's sideways glance at the vocabulary of electronics may help.

One of the problems confronting the learner (and hence the teacher) in any subject lies in becoming familiar with specialist vocabulary. Technology is no exception to this, and its difficulties are often compounded by the use of terms in particular ways where the precise meaning may be different from — or even conflict with — 'everyday' usage. Examples which readily come to mind include (from the realm of materials) *hardwood, plastic and brittle*, or (from the domain of machines) *force, energy, power* and even *machine* itself.

One approach to this linguistic dilemma is that of the humorist, in which ambiguity or incongruity provide a potential deliberate challenge to understanding. Whether the essential element is provided by the forces encountered by a bricklayer (Hoffnung in 1954) or other areas of knowledge and understanding (Hawkey, 1995), much of science and technology can be successfully addressed in this way. The dialogue which follows applies this style to electronics, in the style of a head-to-head between Mel Smith and Griff Rees-Jones.

Mel: Do you know what this is?

Griff: No, what is it?

Mel: It's a chip!

Griff: Get away — there's no grease on it and it doesn't smell of vinegar.

Mel: Not *that* kind of chip — a *silicon* chip.

Griff: Has it been cooked in silicone grease, then?

Mel: No — it's electronic. Like in radios and TVs — transistors and all that.

Griff: Oh yeah, I remember. They grow them in silicon valley in the US — Texas, I think.

Mel: They don't *grow*! They're made from sand.

Griff: You don't expect me to believe that, do you? Last week you tried to tell me that *glass* was made from sand!

Mel: Well, it is — and so are micro-chips.

Griff: What do they do then, these micro-chips?

Mel: They're part of electronics systems: very small transistors and resistors and diodes —

Griff: — Hang on a minute — resistors? Wasn't that, you know — like 'Allo 'Allo — in the war?

Mel: Resistors, not resistance!

Griff: And this *diode* — sounds like a Welsh poet!

Mel: Don't you know *anything*?

Griff: Not this science and techno stuff, no. It didn't seem to be important when I was at school.

Mel: Well, it is.

Griff: So what about these chips? What do they do exactly?

Mel: Transistors are like valves: they decide whether to let stuff through or not.

Griff: My Grandad had a valve replaced, in his heart. Did they put a transistor in, then? Or a chip?

Mel: Not that kind of valve — *electronic* valves.

Griff: What do they do, then?

Mel: They, well — they decide to let current flow — or not.

Griff: No currants without a good raisin, eh?

Mel: Oh, very funny.

Griff: And what about these diodes? What do they do?

Mel: Well, they — they — sort of . . . They're important.

Griff: You don't know, do you? It's all pretend with you. You don't really know any more than I do.

Mel: That's where you're wrong! I know *exactly* what diodes do. They . . . they let electricity flow one way but not the other. So there!

Griff: What use is that, then?

Mel: Well . . . I'm not exactly sure. I know it's important though. Something to do with all those integrated circuits and micro-processors.

Griff: There you go again, using all those big words. Aren't there any simple things in electronics?

Mel: I don't suppose *gate* is simple enough, is it?

Griff: That sounds all right. Garden gate?

Mel: No, *logic* gate. There's three basic types —

Griff: — Five bar, rustic and —

Mel: Just listen, will you? They're called NOT, AND and OR . . .

Griff: Or they're called, and not or. Or not and... Well, I've made a decision: I've had enough. I'm bored by all these circuits.

Mel: Is that supposed to be funny? Circuit board?

Griff: I don't know enough to make jokes. I don't have the capacitance.

Mel: That's where we're different. I can't leave everything in a state of flux.

Griff: While I'm happy just to solder on.

■ References

Flanders, M. and Swann, D., (1964), *First and Second Laws*, MCPS

Hawkey, R. (1995), 'Genetics and evolution: a dialogue' *Journal of Biological Education* (in press)

Hoffnung, G. (1954), 'The Bricklayer' in *Hoffnung at the Oxford Union*, BBC

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