One of the most important figures in science has at last been honoured in Edinburgh with a statue made by an equally unsung Scottish sculptor

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By Duncan Macmillan

JAMES Clerk-Maxwell was "the man who changed everything". He stands between Newton and Einstein in the triad of great scientists who shaped the modern world. But if theirs are household names, his is far less familiar. It should not be so. He was a Scot and the practical applications of the ideas that he formulated almost 150 years ago touch us all. As the basis of electronics, they shape our lives.

He is far less celebrated than Alexander Graham Bell or John Logie Baird but what they did was practical and readily demonstrable. What Clerk-Maxwell did was highly theoretical. He profoundly affected the course of science in several ways, but his central achievement was to unify light, electricity and magnetism by identifying them as different manifestations of a single phenomenon. He also anticipated correctly that they existed across a spectrum that might contain higher and lower frequencies than those then known.

Maxwell inherited the Newtonian view of the world as consisting of matter in space, but he left to us the very different understanding that the universe is shaped by fields of energy unified by a single constant, the speed of light. Einstein was quite clear about Maxwell's status. His field theory, he said, changed our "conception of reality." That is pretty fundamental. Einstein also said famously that as a scientist, he stood not on Newton's shoulders, but on Clerk-Maxwell's.

In his separate, but also revolutionary contribution to statistical mechanics, Clerk-Maxwell opened the way to quantum theory, introducing the troublesome notion of probability to upset old Newtonian certainties. He did all this and much else, yet he died on 5 November 1879 aged just 48.

If we have not hitherto given Clerk-Maxwell the recognition that is his due, that wrong has now been righted. Indeed we will now meet him in the street. Or at least we will if we walk east along George Street in Edinburgh. There at the junction with St Andrew Square, a monumental bronze of Clerk-Maxwell made by Alexander Stoddart and cast in Nairn by Black Isle Bronze has been installed on a high granite plinth.

He is seated, relaxed and contemplative, his legs crossed and his dog, Toby, tucked beneath them. He is holding a colour-top, a device he used to establish that any colour can be produced from the admixture, not of the three primaries, but of red, blue and

green, and that this mixture can be measured quantitatively. It is an observation that underlies all colour printing and indeed the colour range in computer monitors. In the sculpture, however, his gaze suggests he is looking far beyond this first essay in the physics of light towards the profound insights of his later career.

On the front of the plinth his name and dates are simply inscribed. The convention is that if you deserve a monument, then what you did needs no explanation. The day after it was unveiled, I saw people curious but also baffled by this new addition to the iconography of our streets, and was neither convinced that the rule is any longer true, nor that the planned addition of Maxwell's equations to the plinth – the elegant mathematical summary of his field theory – will greatly enlighten many passers-by. Perhaps some discreet interpretation is needed.

There is some partial explanation here already, however, even if it is a little cryptic. In bronze reliefs on the sides of the plinth, Stoddart sets Clerk-Maxwell between Newton and Einstein. Both the latter are represented as classical philosophers demonstrating their key ideas with the assistance of attendant deities.

On the south panel, Apollo, the sun god, stands on the left. His light passes through Newton's prisms. Aurora, goddess of the dawn stands on the right. Demonstrating Newton's observations of light's behaviour, implicitly red light touches her, the rosy-fingered light of dawn separated out from the white light of the sun by the prisms that stand between them.

On the north panel, an emblematic, neoclassical Einstein demonstrates how bodies distort the space around them. Apollo is again standing on the left, but here he has himself been struck by an arrow fired by Eros on the right. Eros is the god of love, but though he is only a boy, not even the greatest gods can resist his power. Here he stands for gravity, the weak force, but the force to which everything else is subject.

This latest monument follows Alexander Stoddart's statues of David Hume and Adam Smith, the latter unveiled earlier this year. As in them, he has respected the established style of monumental sculpture. He is right to do so. This is no place for any shrill assertion of modernity, of difference from the past. The very point of such a monument is continuity: the continuing presence and enduring influence of those who have gone before us.

Clerk-Maxwell is less classical than Stoddart's Hume, and less heroic than his Smith. He has instead a certain sober informality about him. He was a Victorian and the pose Stoddart has chosen pays homage to Whistler's portrait of Thomas Carlyle. The analogy locates Clerk-Maxwell among the great Victorians and so sets him in a period we are encouraged to see as post-Enlightenment. But Clerk-Maxwell is so much an Enlightenment figure in the breadth of his thought and its profound originality, maybe we can now see that is wrong.

Although a professed anti-modernist, Stoddart reveals his views as more complex than he might sometimes have us believe by making another analogy here. With Whistler, art left behind a Newtonian kind of structure to embrace instead – in Einstein's phrase – the changed conception of reality that shaped modern art. Nor is that just a casual analogy. Clerk-Maxwell belonged to the family of the Clerks of

Penicuik which had long and intimate links with the visual arts. Clerk-Maxwell was not himself an artist, but starting from his analysis of colour and then of light itself and including the models by which he conceived his central theory, almost everything he did was profoundly visual. That was also characteristic of the Enlightenment; but then so, too, is Stoddart's implicit suggestion here that art and science are not really so far apart.

This monument has been installed by the Royal Society of Edinburg in recognition of one of its most distinguished fellows, after a considerable and ongoing fundraising effort. Clerk-Maxwell began his career with a paper presented to the Society when he was just 14. The project was initiated and largely carried through by Sir Michael Atiyah, recently the Society's president. His name is among the donors listed on the back of the plinth, but he's there by implication in the sculpture itself, too.

The lace on Clerk-Maxwell's right shoe has broken. As we all do, he has simply knotted the shortened lace, missing out an eyelet. String theory is the latest chapter in the understanding of the fundamental construction of the universe that was begun by Clerk-Maxwell. Sir Michael is a very distinguished mathematician. His theorem, called the Atiyah-Singer Theorem, is one of the landmarks of 20th-century mathematics and has helped in the unravelling of the mysteries of string theory. One of his publications has the innocent-sounding title The Geometry and Physics of Knots. In Clerk-Maxwell's broken shoelace, Alexander Stoddart has paid him a discreet compliment, acknowledging his central place in the genesis of the sculpture, but even more importantly his place in the intellectual succession to Clerk-Maxwell.

As a Fellow of the Royal Society of Edinburgh, I must declare a small interest in all this, though, as I had no part in the commission, I hope it is quite proper to express my satisfaction that, through Stoddart, the Society has so fittingly commemorated this very remarkable Scotsman. I could express a hope here, too, though that all the bronze and marble gentlemen who adorn our streets will one day get some female company.