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“Perspicacity... and a degree of good fortune”: opportunities for revealing the natural world

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Experimental science is now more possible and accessible than ever, due to the ready abundance of sensors and recording systems. However, as commercial development of sensors generally follows demand and profitability, most of the options are restricted to devices sensing the most commonly monitored physical quantities. A scientific need can therefore still arise - which Christiaan Huygens would no doubt recognise, and indeed confronted so ably - for an entirely new instrument. As for Huygens' era, the role of the experimentalist includes seeking and exploiting the best method available for each scientific investigation. This includes modern advances in electronics, materials and production. I will describe some of my own work in atmospheric electricity to try to illustrate the continued value of this approach, in which scientific objectives have driven the design, development and deployment of new instruments for which there were no commercial options. Existing measurement infrastructures, for example surface meteorological observing systems and weather balloon networks, can be enhanced as a result, from embedding and including new sensors, instruments and devices.