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Nota di contenuto	Introduction : the origin of observation and measurement -- 1. Measurement in antiquity -- 1.1. Man is the measure of all things -- 1.2. Seeds and cosmic forces -- 1.3. The Bronze-Age -- 1.4. Ancient time metrology : the calendar -- 1.5. The Roman Empire 2. Measurement in the early modern period -- 2.1. 'Measured by the King's iron rod' -- 2.2. Measuring the world -- 2.3. The pendulum : the world's first precision measuring device -- 2.4. 'Dear boy ...' 3. Measurement in the modern world (I) -- 3.1. Surveying and measuring the Earth -- 3.2. The circumference of the Earth -- 3.3. The Chinese survey -- 3.4. La Revolution Francaise -- 3.5. Defining the size of the world -- 3.6. The metric survey -- 3.7. The error in all things 4. Measurement in the modern world (II) -- 4.1. Envy, money, terror, and the metric system -- 4.2. The endgame -- 4.3. Avez-vous l'heure s'il vous plait? -- 4.4. Falling out of favour with the metric system 5. Creating the language that is science -- 5.1. Dividing apples with oranges to make ... something different -- 5.2. The consequences of mixing units -- 5.3. Derived units -- 5.4. A final comment on the value

of a quantity

6. What was not in the original metric system? -- 6.1. Energy, work, and power -- 6.2. Electricity -- 6.3. The molecule meme -- 6.4. Unit conversion in electromagnetism

7. Measurement in the age of scientific certainty -- 7.1. The Convention du metre -- 7.2. Conference generale des poids et mesures (CGPM) -- 7.3. Comite international des poids et mesures (CIPM) -- 7.4. Bureau international des poids et mesures (BIPM)

8. A true universal language : the SI -- 8.1. Even scientists cannot always agree on units

9. 20th century confusions and refinements in measurement -- 9.1. International politics -- 9.2. Events at the BIPM during the Fall of France, June 1940 -- 9.3. Two peoples separated by a common system of weights and measures

10. The birth of the Quantum-SI -- 10.1. The need for change -- 10.2. The problem that was the kilogram -- 10.3. The background to the redefinition

11. The base units of the Systeme International des Unites (I) -- 11.1. The base unit of length is the metre (m) -- 11.2. The base unit of mass is the kilogram (kg) -- 11.3. The base unit of electric current is the ampere (A) -- 11.4. The base unit of thermodynamic temperature is the kelvin (K) -- 11.5. The base unit of light intensity is the candela (cd) -- 11.6. The base unit of amount of substance is the mole (mol)

12. The base units of the Systeme International des Unites (II) -- 12.1. The base unit of time is the second (s) -- 12.2. The future of frequency standards -- 12.3. The mechanism of an optical clock -- 12.4. Secondary representations of the second -- 12.5. Possible applications of optical clocks

13. The new Systeme international des unites -- 13.1. Some further details of the Quantum-SI -- 13.2. Experimental measurements of the elementary charge, e -- 13.3. The problem of the permeability of space in the new SI -- 13.4. Determination of the Planck constant -- 13.5. Measurement of NA by x-ray diffraction

14. For this is science -- 14.1. Units of measurement must evolve, because science evolves -- 14.2. The constants of Nature -- 14.3. Final thoughts on the evolution of units of measurement.

Sommario/riassunto

Measurement forms an essential part of our view of the world. Our world is measured and calibrated, and we are all subject to the tyranny of these numbers. In this updated and extended edition, Jeffrey Huw Williams outlines the history of measurement; particularly of the International System of units (SI). Since the previous edition, the base units of the SI have been redefined; realising a 150-year-old dream for a measurement system based on unchanging, fundamental quantities of nature. This change has created a new SI, a Quantum-SI, which will significantly change the way we look at nature in a quantitative manner, and greatly facilitate the advance of science.
