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A Time Traveler's History of Physics ROBERT CLOSE, Clark College — The history of science is often presented as a logical progression of better and better theories to explain increasingly accurate data. However, the reality is that misconceptions can persist long after better explanations are proposed or contrary evidence is available. Many advances in science have been subject to Planck's principle that new scientific truths do not triumph by convincing opponents, but rather because opponents eventually die off. Nobel Laureate Paul Lauterbur recently commented that one could write the entire history of science in the last 50 years in terms of rejected papers. Is it possible to identify misconceptions in the present without waiting for historical judgment? One way to test the robustness of our ideas is to imagine how they would change if historical events had occurred in a different order. For example, if de Broglie's hypothesis of the wave nature of matter had preceded the Michelson-Morley experiment, then aether-drift experiments might have been regarded as tests of the wave nature of matter rather than as tests for the existence of an aether. We incorporate recent work and attempt to construct a logical rather than temporal history of physics. This procedure suggests that many common beliefs about modern physics are subject to reinterpretation.

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