Dirac fermion such as the electron. So far, Majorana fermions have not been observed clearly in experiment, but it has been predicted that in some situations an electron may split into two Majorana fermions[10], and that several interesting condensed-matter phases are believed to support them as emergent excitations. A direct observation of a Majorana fermion would be a key step on the path to quantum computation using topological phases.

There are important open problems for theory as well. The topological insulator phase can be defined at the single-electron level, manifesting excitations having the quantum numbers (spin and charge) of the electron, similar to the integer quantum Hall effect. In contrast, the fractional quantum Hall effect is a topological phase displaying excitations with fractional charges and statistics. Our developing understanding of topological insulators may lead us to discover new 'fractionalized' phases of this sort. The two papers in this issue demonstrate that rapid experimental and theoretical progress in the research on topological insulators is both answering and raising fundamental questions pertaining to possible exotic phases of electrons in solids. ❐

Joel Moore is in the Department of Physics, University of California, and the Materials Sciences Division, Lawrence Berkeley National Laboratory, Berkeley, California 94720, USA.
e-mail: jemoore@berkeley.edu

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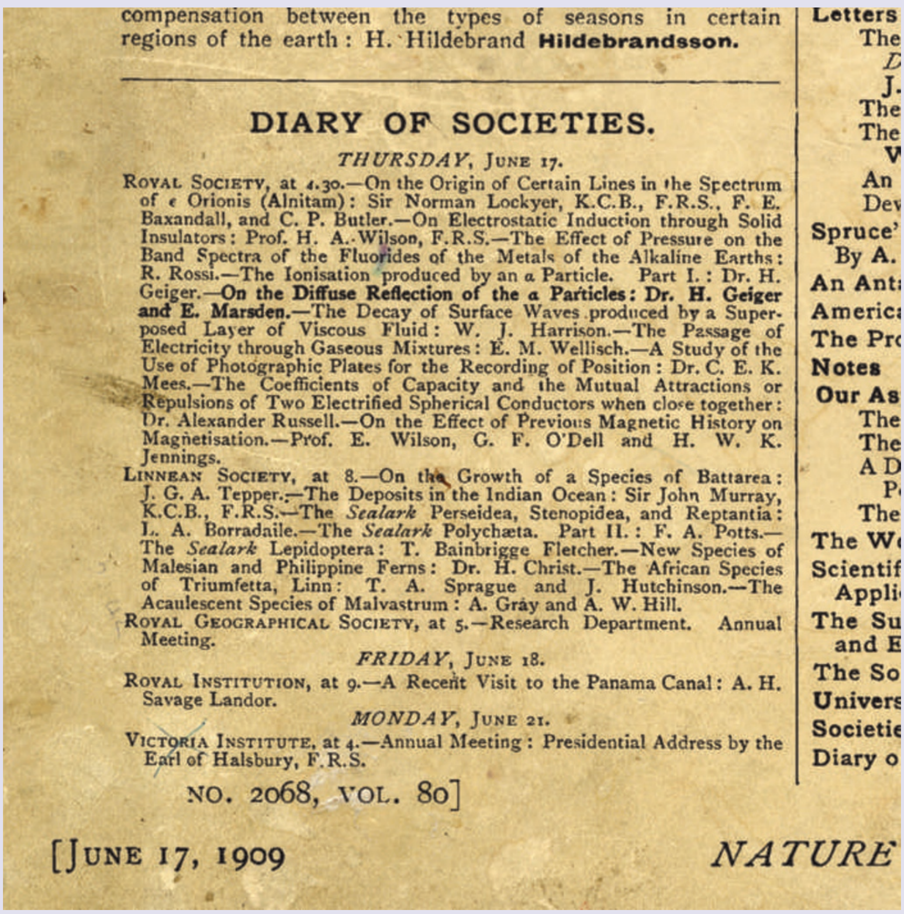
NUCLEAR PHYSICS

An afternoon's outing

Hidden in the yellowing pages of century-old issues of *Nature* are some scientific gems. They might be fully fledged 'Letters to the Editor', curiosities from 'Notes' or nuggets from 'Our Astronomical Column'. Even the simple listings in 'Diary of Societies', at the end of each issue, can be fascinating — as is this entry (pictured) from the issue of 17 June 1909.



compensation between the types of seasons in certain regions of the earth: H. Hildebrand **Hildebrandsson.**

DIARY OF SOCIETIES.

THURSDAY, JUNE 17.

ROYAL SOCIETY, at 4.30.—On the Origin of Certain Lines in the Spectrum of ε Orionis (Alnitam): Sir Norman Lockyer, K.C.B., F.R.S., F. E. Baxandall, and C. P. Butler.—On Electrostatic Induction through Solid Insulators: Prof. H. A. Wilson, F.R.S.—The Effect of Pressure on the Band Spectra of the Fluorides of the Metals of the Alkaline Earths: R. Rossi.—The Ionisation produced by an α Particle. Part I.: Dr. H. Geiger.—**On the Diffuse Reflection of the α Particles: Dr. H. Geiger and E. Marsden.**—The Decay of Surface Waves produced by a Superposed Layer of Viscous Fluid: W. J. Harrison.—The Passage of Electricity through Gaseous Mixtures: E. M. Wellisch.—A Study of the Use of Photographic Plates for the Recording of Position: Dr. C. E. K. Mees.—The Coefficients of Capacity and the Mutual Attractions or Repulsions of Two Electrified Spherical Conductors when close together: Dr. Alexander Russell.—On the Effect of Previous Magnetic History on Magnetisation.—Prof. E. Wilson, G. F. O'Dell and H. W. K. Jennings.

LINNEAN SOCIETY, at 8.—On the Growth of a Species of Battarea: J. G. A. Tepper.—The Deposits in the Indian Ocean: Sir John Murray, K.C.B., F.R.S.—The *Sealark* Perseidea, Stenopidea, and Reptantia: L. A. Borradaile.—The *Sealark* Polychæta. Part II.: F. A. Potts.—The *Sealark* Lepidoptera: T. Bainbrigge Fletcher.—New Species of Malesian and Philippine Ferns: Dr. H. Christ.—The African Species of Triumfetta, Linn: T. A. Sprague and J. Hutchinson.—The Acaulescent Species of Malvastrum: A. Gray and A. W. Hill.

ROYAL GEOGRAPHICAL SOCIETY, at 5.—Research Department. Annual Meeting.

FRIDAY, JUNE 18.

ROYAL INSTITUTION, at 9.—A Recent Visit to the Panama Canal: A. H. Savage Landor.

MONDAY, JUNE 21.

VICTORIA INSTITUTE, at 4.—Annual Meeting: Presidential Address by the Earl of Halsbury, F.R.S.

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[JUNE 17, 1909 *NATURE*

At the behest of their boss, Ernest Rutherford, at the University of Manchester, Hans Geiger and Ernest Marsden had been conducting experiments on the scattering of α particles from a thin gold foil. On that June afternoon — a century ago — they were to present to London's Royal Society their data "On the Diffuse Reflection of the α Particles" (*Proc. R. Soc. A* **82,** 495–500; 1909).

The rest really is history. Geiger and Marsden had observed that, although most α particles passed through the foil pretty much undeflected, very occasionally — and contrary to expectation — an α particle could be scattered right back, through a very large angle. Rutherford had the interpretation: "the atom consists of a central charge supposed concentrated at a point", he wrote later (*Phil. Mag.* **21,** 669–688; 1911); the atom, far from being the 'plum pudding' that had been envisaged, had a nucleus.

Rutherford acknowledged that the essence of his nuclear model had been captured in the 'Saturnian atom' of Japanese physicist Hantaro Nagaoka (*Phil. Mag.* **7,** 445–455; 1904), "which he supposed consisted of a central attracting mass surrounded by rings of rotating electrons". But it was these data from Geiger and Marsden in 1909, and those that followed, that enabled the detail of the structure of the atom to be drawn more accurately than ever before. The nucleus was revealed, and a century of nuclear physics began.

ALISON WRIGHT