ful photocopier an inventor, not an amateur (or professional) scientist.

Alfred Loomis was a man who indeed did much to assist physicists and to establish fine laboratories on a financially sound basis. He was also an excellent administrator, but as I look at his own contributions to science I hestitate to designate him as a scientist. He was truly a man who loved science and enjoyed being around where it was going on, and probably contributed useful suggestions, but his own contributions to science seem not to be significant. In any case, to talk about him in the same breath as Isaac Newton is unjustifiable.

As far as the invention of the airplane is concerned, it seems to me that the "invention" of the airplane came when Samuel Pierpont Langley—an astronomer and the secretary of the Smithsonian Institution, not a "professor"—flew a heavier-than-air machine three-quarters of a mile in 1896, unmanned. He was testing a manned verson over the Potomac in 1903, unsuccessfully, just 9 days before the Wright brothers flew at Kitty Hawk.

I would suggest that "First-generation founding fathers are often amateurs" but more often are professionals. As far as Edwin Land is concerned, I think that it is necessary to discriminate between a "college dropout" and someone who leaves college to work in a laboratory. Finally, I cannot believe that Thomas Edison was a prolific inventor because he didn't go to college.

E. Scott Barr

6/83 *Tuscaloosa, Alabama*

Anti-Jewish policy?

Melvin Shaw has my sympathy for his experience of having his contract to lecture in Saudi Arabia cancelled, possibly because of his Jewish background (May, page 15). It must be disconcerting to be singled out in this way.

It is only fair, however, to point out that the Saudi policy is not aimed at Jews *as Jews*: The Koran has innumerable instances where "the sons of Israel" are praised. Rather, there is a state of war with the modern Israel, and since many Jews might have dual citizenship, say US and Israeli, the policy becomes an unfortunate necessity. Israel, too, has a parallel policy of not allowing most holders of Arab passports within its borders, not because of any anti-Moslem feelings but as an elementary exercise in security.

In spite of its own significant achievements in physics, Israel is not noted for encouraging similar progress in Arab lands. Some examples are the bombing of the Iraqi nuclear reactor, the arrest and expulsion of Palestinian physicist Hanna Nasir, president of Bir Zeit

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MODERN PROBLEMS IN CONDENSED MATTER SCIENCES, Volume 6

Electron-Hole Droplets in Semiconductors

edited by C.D. JEFFRIES *and* L.V. KELDYSH

1983 about 670 pages
Price: US $180.75/Dfl. 425.00
Subscription Price: US $153.25/Dfl. 360.00
ISBN 0-444-86530-6

This book, volume 6 in the series Modern Problems in Condensed Matter Sciences, is an extensive review and analysis of novel electron-hole liquids that can be found in a variety of semiconductors. A discussion, from first-principles, is given on their properties, both theoretically and experimentally. There are eight chapters, including a general introduction, each written by the major contributors in this field from both the U.S.A. and the U.S.S.R. with extensive references to the world literature. Much of the material is new. The treatment is thorough and the coverage is rather complete.

CONTENTS: Preface. **Chapters 1.** Electron-hole liquid: theory *(P. Vashishta, R.K. Kalia and K.S. Singwi).* **2.** Thermodynamics of electron-hole liquid in semiconductors *(V.D. Kulakovskii and V.B. Timofeev).* **3.** Kinetics of electron-hole drop formation and decay *(R.M. Westervelt).* **4.** Interaction of EHD with deformation field, ultrasound and nonequilibrium phonons *(V.S. Bagaev, T.I. Galkina and N.N. Sibeldin).* **5.** Strain-confined excitons and electron-hole liquid *(J.P. Wolfe and C.D. Jeffries).* **6.** Transport phenomena in electron-hole liquid *(Ya. E. Pokrovskii).* **7.** Interaction of electromagnetic radiation with electron-hole droplets *(R.S. Markiewicz and T. Timusk).* **8.** Electron-hole liquid in a magnetic field *(A.P. Silin).* Indexes.

Order in Chaos

Proceedings of the International Conference on Order in Chaos held at the Center for Nonlinear Studies, Los Alamos, U.S.A., 24-28 May 1982

edited by DAVID CAMPBELL *and* HARVEY ROSE

Reprinted from the Journal:
Physica D, Volume 7D (1983)

1983 about 370 pages
Price: US $61.75/Dfl. 145.00
ISBN 0-444-86727-9

The purpose of this conference was to survey the rapid recent developments and to anticipate the trends for future research in the area of "chaos in deterministic systems". The breadth of scientific interest in this topic was reflected in the variety of subjects discussed at the meeting. Presentations ranged from abstract mathematics through numerical simulations to experimental studies of fluid mechanics, chemisty and biology.

The articles are roughly divided into two major areas. First, an attempt to identify the essential qualitative and quantitative features of deterministic chaos, with the aim of describing and modelling it more accurately. Second, discussions of the transition from regular motion to chaos in both experimental systems and theoretical models. However as could be expected from the title, the articles overlap in context and technique in a variety of interesting, nonlinear ways.

Handbook on the Physics and Chemistry of Rare Earths, Volume 6

edited by KARL A. GSCHNEIDNER, JR. *and* LEROY EYRING

1983 about 604 pages
Price: US $138.25/Dfl. 325.00
Subscription Price: US $119.25/Dfl. 280.00
ISBN 0-444-86592-6

A COMMENT FROM THE PRESS ON VOLUMES PREVIOUSLY PUBLISHED:
"...Highly experienced authors have written each review usually at a level suitable for advanced postgraduate students and research workers from a variety of fields. With the great richness of information involving references to other review articles written from different points of view, the books are an important reference source and should be on the shelves of most libraries."
Journal of Applied Crystallography

Although volumes three, four and five contained some information concerning ternary and higher order materials, this vast area is still virtually unknown. Volume six is the beginning of an extensive exploration of this area which will extend into future volumes. The four chapters in volume six deal with ternary (and higher order) systems, compounds, etc., which contain at least one rare earth metal and at least one nonmetallic element (H,B, C or Si). The first chapter deals with hydrogen absorption by intermetallic compounds. The next two chapters are quite complimentary dealing with the crystal chemistry of ternary borides and silicides and phase equilibria in ternary and higher order systems involving boron. A companion chapter on phase equilibria in ternary and higher order systems involving silicon is scheduled for volume seven. The last chapter of volume six is a little more specialised and is concerned with divalent samarium and ytterbium in organic chemistry. Future volumes are scheduled to contain more reviews on the organic chemistry of rare earths - a rapidly growing and dynamic area of ternary and higher order materials.

CONTENTS: **Chapters 1.** Hydrogen absorption in intermetallic compounds *(K.H.J. Buschow).* **2.** Crystal structures and crystal chemistry of ternary rare earth-transition, metal borides, silicides and homologues *(E. Parthé and B. Chabot).* **3.** Phase equilibria in ternary and higher order systems with rare earth elements and boron *(P. Rogl).* **4.** Preparation of divalent ytterbium and samarium derivatives and their use in organic chemistry *(H.B. Kagan and J.L. Namy).* Index.

Noise in Physical Systems and 1/f Noise

Proceedings of the 7th international Conference on "Noise in Physical Systems" and the 3rd International Conference on "1/f Noise", May 17-20, 1983, Montpellier, France

edited by MICHEL SAVELLI, GILLES LECOY *and* JEAN-PIERRE NOUGIER

1983 xii + 432 pages
Price: US $63.75/Dfl. 150.00
ISBN 0-444-86800-3

These proceedings of two international conferences on noise, held simultaneously for the first time, contain 80 contributed and 11 invited papers. The three main areas covered are: - 1) Noise theory and mechanisms, including non equilibrium state; transition and relaxation phenomena; chaotic systems and nature fractal. 2) Noise in devices, including resistors and thin films; supraconductors, interferometers, Josephson diodes and SQUIDS for quantum noise; oscillators; bipolar and field effect transistors. 3) Noise in systems including a particule radiative decay; organic devices; 1/f noise and reliability.

CONTENTS: Opening Address *(M. Savelli).* **Sessions: Theory.** Invited Papers: Noise out of equilibrium *(C.M. van Vliet).* Why is nature fractal and when should noises be scaling? *(B.B. Mandelbrot and R.F. Voos).* Transition phenomena induced by multiplicative noise in nematic liquid *(R. Lefever and W. Horsthemke).* **Theory 1/f Noise. Chaotic Systems.** Invited Papers: Noise in chaotic fluid systems *(A. Libchaber).* Chaos and noise in Josephson tunnel junctions *(J. Clarke, R.F. Miracky, J. Martinis and R.H. Koch).* **Quantum Noise. Hot Carriers and Submicron Devices.** Invited Papers: Thermal, shot, diffusion and 1/f noise in GaAs and GaAs devices *(A. van der Ziel).* Noise of submicro devices *(J.P. Nougier).* **1/f Noise in Resistors and Thin Films. Noise in Diodes and Transistors. 1/f Noise in Diodes.** Invited Paper: 1/f Noise used as a reliability test for diode lasers *(L.K.J. Vandamme and L.J. van Ruyven).* **1/f Noise in Bipolar Transistors. 1/f Noise in Field Effect Transistors. Oscillators.** Invited Paper: Phase and frequency noises in oscillators *(J.J. Gagnepain).* **Other Physical Systems. Noise in Physical Chemical and Biological Systems.** Invited Paper: 1/f Noise and fluctuation analysis in biological membranes *(D. Poussart).* **Metrology.** Closing Address. Detailed Program of the conferences. List of Participants. Indexes.

letters

University, refusal to grant a permit to build an Arab polytechnic near Jerusalem, the closure of Palestinian universities in the West Bank, banning books, and the destruction of the Arab University in Beirut during last summer's invasion. Ideally, nothing of this can justify what can be taken as an anti-Jewish policy, but does it make it a bit more understandable?

V. F. TAMARI
Tokyo, Japan

6/83

Development of radar

The letters by John DeWitt, Ernest Linder, and Luiz Alvarez (June, page 101) on the early history of radar call for comment.

I was the engineer at the Signal Corps Laboratories who invited Irving Wolff and Linder to demonstrate the utility of their 9-cm microwave equipment at Sandy Hook in 1934. This was part of a program at SCL to determine the usefulness of microwaves for target detection. Alvarez compares the 13 watts of power generated by the RCA equipment unfavorably with the 50 kW of peak power available from British magnetrons in 1940, which he views with awe. The radar range equation as used in 1942 and later shows that the range attainable with a given target, in view of the noise figure of the receiver and its required bandwidth, is a function of average rather than peak transmitter power. Thus if 1-microsecond pulses are used, spaced at 1000-microsecond intervals, to yield a 100-mile-range scale permitting high-range resolution, the average power is 50 watts, or about 4 times the power available from the RCA equipment. The latter used tone modulation with a narrow-band receiver, so the range of a little less than one mile observed on a small vessel in the Ambrose channel is not surprising. Doppler and cw radar have their uses even today.

The method described to me by William Blair, Director of SCL during the 1930s and during the period when work was initiated at Fort Monmouth in 1933, envisioned the use of one tone-modulated microwave transmitter together with several narrow-band receivers to detect microwave power reflected from an airplane and thus determine its position. This method is an outgrowth of the method employed in 1933 and earlier that used a searchlight to illuminate a target and then determined its position using several receivers with good angular resolution to detect the reflected light.

One of my contributions at SCL was to persuade Blair, with most effective