

of action of uranium compounds on the animal body, and succeeds extremely well in this respect.

The final chapter of Part 1 deals with the problem of human exposure, and discusses in this respect the clinical findings and observation made following a few accidental acute exposures, mainly to uranium hexafluoride. The effects of chronic uranium exposure are also considered with reference to workers in the uranium industry—150 μ gm. of uranium per c.u.m. of air being the maximum permissible level of air contamination set for industry at the time, and not 50 μ gm. as at present applicable in Great Britain. Finally, an outline is given of the extensive studies carried out on individuals employed in various uranium-processing plants. Many may consider the scope of these investigations to be unnecessarily complex.

Part 2 of this work is devoted to a consideration of elemental fluorine and hydrogen fluoride. Inhalational toxicity is considered, and the methods of treatment of the two major types of burns (thermal and chemical) outlined. It was discovered that fluorine produces a burn that is predominantly thermal in character as compared with the peculiar chemical nature of the hydrogen fluoride burn.

The appendix contains details of the large complex organization that went to make up the Manhattan Department of the University of Rochester. An excellent index is included. Any imperfections in manner of presentation, which certainly could be improved upon, can be excused (as mentioned in the volume editor's preface, p. xiii) by reason of the fact that the manuscript was completed to a time schedule by the limited number of personnel remaining after many of the original investigators had returned to other work.

ALAN BUTTERWORTH

THE DIVINING ROD

Psychical Physics

A Scientific Analysis of Dowsing, Radiesthesia and kindred Divining Phenomena. By Prof. S. W. Tromp. Pp. xv+534. (Amsterdam and New York: Elsevier Publishing Co., Ltd.; London: Cleaver-Hume Press, Ltd., 1949.) 60s.

THESE are three schools of thought about dowsing: that it is a physical process; that it is a branch of parapsychology (psychical research), diagnosis being made by a process akin to telepathy; and thirdly that it is charlatanry. S. W. Tromp, of Leyden, now professor of geology in the University of Cairo, believes "that these phenomena can be explained by the normal physical and physiological laws". Nevertheless, he calls his 534-page book "Psychical Physics". Chapter 1 deals with electromagnetic and electrostatic fields in living organisms (ranging from Donnan equilibria and brain-rhythms to Gurwitsch's "mitogenetic rays"), in the earth's crust (orthodox geophysics) and in the atmosphere (meteorology). Chapter 2 deals with the influence of electromagnetic and electrostatic fields on living organisms, including reports of their effects on growth of plants and animals, on cancer, and in pain relief. Chapter 3 is mainly concerned with dowsing for water, metals and magnetic fields, with sexing and with diagnosis of disease by pendulum and the like, the emphasis being on magnetic fields and the author's own experiments. Tromp makes no attempt to distinguish sound from unsound work, though he presents a balanced case for Gurwitsch.

Can dowzers substantiate their claims? Tromp by-passes this fundamental question. Recent reviews (by parapsychologists) of literature on dowsing maintain that the verdict cannot be given until more rigid tests have been carried out. In New South Wales the practice of dowsing is widespread; the Water Conservation and Irrigation Commission's records, kept since 1918, show that 84 per cent of bores were successful on undivined sites against 70 per cent on divined sites. I have often asked dowzers: "Do you find a knowledge of geology a useful adjunct?" The answer has always been quite frank: "Very useful indeed"; but the problem of testing the dowsing claim in the field becomes acute. Laboratory tests usually fail, and few dowzers now claim to succeed under laboratory conditions.

In the assessment of their claims, dowzers have had to put up with a good deal of prejudice by men of science. Tromp's book and, in particular, his own experiments will do little to dissipate it. He claims, for example, to have proved that dowzers can detect changes in field-strength of 0.001 oersted. He quotes ten single trials in which a blindfolded student indicated whether he got a reaction while standing near a tangent galvanometer when the ring was either moved from a horizontal to a vertical plane (and vice versa) or not moved at all. The subject scored nine out of ten. Reference to the original paper (*Tijdschrift voor Parapsychologie*, 15, 39; 1947) reveals that Tromp's claim in this book is based on these ten trials alone. Moreover, the 'targets' were not presented in a random order—an elementary rule in all parapsychological 'guessing' experiments.

In the old days the dowser just dowsed, and either found water or did not. Things are more complicated to-day. Tromp needs twenty pages (pp. 340-60) to describe the factors liable to influence or disturb the dowser—conductivity of the soil, human skin potentials, sunlight, cosmic rays, gases and dust in the air, vegetation, atmospheric potential gradient, and numerous others. Since valid evidence for the primary phenomenon is hard to come by, it is pertinent to ask how small differential effects can have been established with certainty.

The book has a valuable list of references. The *Proceedings of the Society for Psychical Research* are confused with the *Proceedings of the National Laboratory of Psychical Research*, and there are many misprints throughout the book. DENYS PARSONS

PATENTS AND INDUSTRIAL DESIGNS

Patents for Inventions and the Registration of Industrial Designs

By T. A. Blanco White. Pp. lix+389. (London: Stevens and Sons, Ltd., 1950.) 45s. net.

Patents and Registered Designs and their Exploitation

By T. A. Blanco White. (This is the Law Series.) Second edition. Pp. ix+79. (London: Stevens and Sons, Ltd., 1950.) 4s. net.

IN the first and the larger of these two books, which is the one with which we are here chiefly concerned, Mr. T. A. Blanco White is to be congratulated upon producing such a useful work written around