forms, which come and go. Those which are not quite so ephemeral remain and can be observed at any time.

For the last four years, collections of the red algae, *Compsopogon coeruleus,* have been made there. It is one of the rarer members of the family, and it is especially interesting to observe it spreading among local indoor pools and aquaria.

In January, 1934, approximately, *Lophopodella carterii,* the bryozoan, first appeared in the warm water of the greenhouse pools, and since has spread throughout northern Ohio. I have actually seen many plants covered with this beautiful form being sent to water-garden enthusiasts in various sections of the country. Interestingly enough, too, this same company has its main plant, seventeen acres of growing pools and greenhouses, located at Saddle River, New Jersey, the same state in which Dr. Dahlgren, of Princeton University, observed the animal.

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COLLECTION OF UNORTHODOX CURIOSA

THE writer has in his possession about two cubic feet of pamphlets and books, nearly all "published by the author," which fall in the category perhaps most charitably designated as unorthodox hypotheses in science (they bear earmarks which scientific men will recognize from this description), and which he has thought of donating to some institutional library where there might be a special interest in the history of science. The collection, for its possible value as curiosa, may not be considered worth shelf room, but, on the other hand, it might prove to be of interest or value to future historians of science and civilization, showing as it would that ours was not yet altogether an age of science, and that there existed among the public considerable opposition to what is often sarcastically described as "orthodox science."

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SCIENTIFIC BOOKS

THE PAGEANT OF ELECTRICITY

The Pageant of Electricity. By ALFRED P. MORGAN. xxvi + 363 pp. D. Appleton-Century Company. 1939.

THIS book is one in the series of "Science for the Layman." The author has written numerous books on popular science and has been an editor of a boys' magazine. However, this book is for mature readers.

The pageant of electricity is a brilliant and fascinating exhibition from whatever angle it is viewed. Here is pictured chiefly the application of electrical principles in commerce, industry, human affairs. The body of the text is preceded by eight pages of chronology of important dates (about 120) in the history of electricity from Roger Bacon to the present time. Three chapters, seventy pages, suffice to bring the story up to Faraday. In these chapters brief, very qualitative statements are made concerning electrical principles. Then the author turns to applications, the development of the telegraph, the career of Edison, the history of the telephone, "electrons dispel darkness" or the story of electrical illumination, electricity carries burdens, electricity and chemistry (the story of aluminum), electron bullets or x-rays, Hertzian waves and radio (100 pages), Doctor Electron or electricity in the hospital.

The story is well told. There is a wealth of historical material, quite a little of which is not found in histories of physics. The author is obviously well acquainted with the commercial side of electricity, and with museums in which are kept models of early forms of telegraph and telephone instruments, early incandescent lamps, electric generators, electron tubes, etc. Many interesting cuts illustrate these devices. Any one desirous of reading the story of the evolution of electrical applications will find these pages appealing and instructive.

The book can not be regarded as a history of electricity from the point of view of a physicist. For example, in the first few pages the author discusses the electron theory of matter. Here he is at least eight years behind the times. For, according to him, the nucleus still consists of electrons and protons instead of neutrons and protons. The term neutron appears once, but there is no place for it in an atom. A conventional model of a hydrogen atom is shown as consisting of two positive and two negative charges. There are other minor criticisms which may be made by a physicist.

But when the author turns to the development of commercial electrical devices, he is at home. Especially is this true in dealing with the contribution of Edison, of Bell, Marconi, DeForest and Major Armstrong. The patent litigation between the last two *inventors* requires several pages for its telling. Here the author very vigorously takes sides. He intimates that the Supreme Court was incapable of understanding the point upon which judgment was to be rendered. "Decision was rendered in favor of De Forest on a matter of *law,* the court not undertaking to *pass on the facts*" (italics are the author's). "But Armstrong had

not lost any prestige in the scientific world. He remained the inventor of regeneration there." All through the discussion of the development of the electron tube and the associated circuits, the author makes it clear that he regards Major Armstrong as a brilliant experimentalist. For example (p. 303), "At twenty-three years of age Armstrong understood the audion better than anyone else in the world." The author does not seem to attach any importance to the pioneer work of O. W. Richardson in giving us the law of electron emission, of Professor Child in setting forth the space-charge relation, of van der Bijl, who gave the quantitative relation for amplification, of Wehnelt, Schottky and others, who had shown the importance of the emitting surface. None of these names occurs in the book.

The reviewer wonders if any one *invented* the regeneration circuit, or rather, if every one working with an electron tube, after van der Bijl and including him, did not invent it. Given the idea of amplification, the circuit is obvious. Many experimenters must have used the circuit, but they weren't in the patenting business. One wonders upon what towering pinnacle Major Armstrong would have been placed had the author been acquainted with or given attention to the recent loudly advertised frequency modulation.

In this chapter there is a minor criticism. The author accounts for the ending *tron* of many of our words, magnetron, radiotron, kenotron, etc., by saying that the Greek word *tron* means empty. There is no such word in the reviewer's lexicons. It is highly probable that the ending is due to that of *electron,* the Greek word for amber. It has a pleasant sound, so why not magnetron, etc.?

The last chapter deals with the attempts to cure human ills from the days when all was mystery and magic to the present time when there is a very small element of knowledge. There is held up for ridicule the use by the Rosicrucians of the occult powers of the magnet—or of something which they called a magnet—but praise is given to the use of fever produced by high-frequency radio waves in the cure of insanity and syphilis (!). It is stated that small-pox can be cured by red light and skin tuberculosis by blue. But the reviewer is of the impression that red light is used in small-pox cases as it is in developing a photographic plate. It would be better not to use any visible light. (Radiant energy is always present.)

In our enthusiasm for modern devices it might be well not to overstate our case.

Radio surgery or the use of the radio knife is praised. The radio knife, more accurately the radio needle or acusector, uses high-frequency oscillations for cutting out, by burning or searing, unwanted tissue. It is stated that Dr. George A. Wyeth, by inventing the endotherm, put electro surgery on the map. Now this instrument with the aristocratic name enables one to use *damped* electrical oscillations obtained by the old spark method or, by throwing a switch, *undamped* oscillations produced by an electron tube. It is claimed that damped oscillations must be used for one purpose, undamped for another. But why undamped can not do everything that can be done by electrical waves the surgeons can not tell us—nor can anyone else. It shows that the medical profession has not emerged from the days of a generation ago, when patients were made to believe that galvanic currents had to be used for one purpose, faradic for another. The patient was awed by the doctor's great knowledge. The magic of to-day, if not black, is at times rather dark and sometimes shady. That remark, however, does not apply to the endotherm which has been an important instrument in radio surgery.

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AGING

Das Problem des Alterns und die Chemie der Lebensvorgange. 2. Auflage. By D. REICHINSTEIN. 420 pp., 16 figs. Zurich: H. Akerets Erben Publishing House. 1940. $9.00.

THE first section of this work presents the conventional summary found in the usual non-critical review of aging. For the most part, the material is old and evidently taken from the familiar German reviews which have appeared in the past. It will prove of little interest to those familiar with the field and of little help to others since it has so few references that the location of the source material will be very difficult.

In the section devoted to the aging of cells, much attention is given to the pigments and the well-known theories of Mühlmann.

After such an introduction physical chemistry is dragged into the field of aging. Great labor is expended in attempting to make physical chemistry encompass the field of aging, but this elusive field constantly seems to escape. The final conclusion of the reader is that much too little is known experimentally about the processes of aging to apply physical chemical theory. The author's attempts are interesting but rather speculative.

Under the section devoted to the chemistry of life processes are discussed such diverse subjects as "Prontosil," choline, certain phases of endocrinology, with some consideration of cellular oxidation and enzyme action. As a whole, the thread of the story is difficult to follow and gives the impression of notes taken by the author on current science which has interested him.

The final section upon the theories of aging affords little that is new and much that could be forgotten.

In general this work neglects modern literature. It lacks the critical approach of such reviews as that of