

In a succeeding article, it is proposed to discuss the very important question of alcohol as a fuel for power-raising purposes, and also to indicate the possibilities shown

by the starting of the Distillery of the Mysore Sugar Factory, Mandya, the entire plant for which was furnished by *Ateliers Pingris et Mollet-Fontaine Reunis, Lille, France.*

Reviews.

HAND- UND JAHRBUCH DER CHEMISCHEN PHYSIK. Edited by A. Eucken and K. L. Wolf. Volume 9, Part 2. (Molekul- und Kristallgitterspektren. Akademische Verlagsgesellschaft M.B.H., Leipzig, 1934.)

This volume contains authoritative articles by Reinkober, Teller, Mecke and Finklenburg on the experimental methods of infra-red spectroscopy, the theory of molecular and lattice spectra in the long wave region, the band spectra of diatomic molecules and finally the structure of some special molecules based on their spectra. In the article on the infra-red spectroscopy, Reinkober has given an account of the various sources of radiation, the different instruments for receiving the radiation, the experimental methods of the analysis of the radiation and the determination of wave-lengths in it. This account of the experimental methods seems to be fairly comprehensive. The theory of molecular spectra in the long wave region has been dealt with by Teller in a very clear fashion. He has presented the theory of the vibration, the rotation and their interaction in the case of a diatomic molecule both on the classical and quantum-mechanical standpoints and also their activity in the infra-red and Raman spectra. Next, the normal vibrations of a polyatomic molecule, their symmetry properties and the selection rules governing their activity in the infra-red and Raman spectra have been dealt with. The rotation of a polyatomic molecule, the interaction of rotation and vibration and the isotope effect in vibration have been also treated. In the next article on the lattice spectra, he deals with the total reflection in the vicinity of a region of absorption and the vibrations of a linear lattice. He has pointed out the relations that exist between the spectra and other properties of crystals. The article on band spectra by Finklenburg and Mecke contains the methods of the photography and the analysis of band spectra, the application of wave-mechanics to a model with two centres, the treatment of the nuclear motion and rotation and the interaction of the rotation and electron motion in the model. The

symmetry properties of molecules and their band structures have also been dealt with. The experimental results of band spectra of diatomic molecules have been collected and presented by Mecke in the next article. The chapter on the structure of polyatomic molecules on the basis of their spectra has been written by Mecke. The expressions for the frequencies of the XY_4 type given on page 353 requires modifications. In the case of acetylene, there seems to be no clear reason as to why $\delta(s)$ (inactive) should be 600 cm.^{-1} except that it should interpret the 1329 cm.^{-1} band in combination with $\delta(a)$ which is 729 cm.^{-1} . One may note that the band in question can be interpreted as $\nu_1(a) - \nu_0(s)$, and the 5250 cm.^{-1} band as $\nu_1(a) + \nu_0(s)$, which is in conformity with Dennison's selection rules. A theoretical calculation of the frequencies based on the valence force system shows that $\delta(s) > \delta(a)$, thus throwing doubt on the assumption that $\delta(s)$ is 600 cm.^{-1} . The split of $\nu(a)$ in CBr_4 observed by Langseth may be explained as due to the resonance $\nu(a) \sim 2\nu(s) + \delta(s)$.

The volume contains clear articles by authoritative persons in the subjects dealt with.

N. S. N.

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PHOTO-ELECTRIC AND SELENIUM CELLS, THEIR OPERATION, CONSTRUCTION AND USES. By T. J. Fielding. (Chapman & Hall Ltd., London.) Pp. 140. Price 6s.

Next to the thermionic valve the photo-electric cell can claim to be one of the most outstanding inventions of the present century and has as universal an application as the former. The advent of the talking pictures and the more recent developments in television has created in the general public a keen desire for knowledge of this interesting device. The host of books that have appeared from time to time have failed to meet this demand since they are very often either too technical or at least demand a fairly good scientific background.

This little book although very limited in its purpose does justice to the intentions of its author, namely providing a brief

introduction to the use of light-sensitive devices in general. The author gives a lucid description of photo-electric and selenium cells and their construction, providing an average practical-minded person, data enough to construct some of the simpler type of selenium cells. The chapter dealing with talking pictures, television and its application to general industry will familiarise the reader with the principles and uses of the photo-cell. On the whole a very useful book for a beginner.

C. C.

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A SYMPOSIUM ON ILLUMINATION. By C. J. Webber Grieverson. (Chapman & Hall Ltd., London.) Pp. 229. Price 13s. 6d.

The book is a collection of lectures, each probably lasting for an hour or so, delivered by eminent men counted as authorities in the various branches of Illumination, as acknowledged by the Editor himself in his Note. It is certainly the best collection I have known. All that could be squeezed within the limited space allotted to the authors has been presented and made intelligible. The book can be recommended to every one who wishes to have a general idea of illumination for various purposes, which no engineer can afford to overlook in the modern rush for securing the best illumination with minimum expenditure.

M. HAYATH.

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SHORT COURSES IN CHEMICAL THEORY. By E. P. Wilson. (T. M. Dent & Sons, Ltd., London, 1935.) Pp. viii+247. Price 3s.

There are very few publications which can be grouped along with the book under review in view of its somewhat novel treatment. The book is a collection of lecture-notes on chemical theory, highly useful to teachers and students alike. There are 22 chapters, dealing with the various aspects of chemical theory as taught in the Colleges to senior students. The notes serve to concentrate the attention on the crucial points of the subject. The book is a very useful addition to every College Library and is the outcome of the long experience of a teacher. Provision is made for the addition of examples, notes and diagrams in the book by the insertion of blank pages and the student is thus enabled to add to the information already contained in the book.

The Book is not, however, free from errors and from the point of view of the student this is to be regretted. To cite a few random

instances: on page 87 under enzyme actions *emulsin* is printed as *emulsion*; one does not speak of *badly* ionised solutions (pages 143 and 144) but of *weakly* ionised solutions; sentences which have no relation to the context are often used as for instance, on page 171, under Osmotic pressure of colloids, it is difficult to understand the bearing of the sentence *Parchment paper (a colloid) gives best results*; on page 172 under electrical properties (5) the sign, =, used against KCl, MgCl₂ and AlCl₃ is incorrect, as the author intends to convey that 49.5 parts of KCl, 0.717 parts of MgCl₂ and 0.093 parts of AlCl₃ possess equal capacities for bringing about coagulation; on page 216, in providing examples for ionic dissociation in solutions we find that the dissociation of NaCl is represented as NaCl → Na + Cl', it should read NaCl → Na· + Cl'. We should also like to see a glossary attached as it is somewhat difficult to understand the large number of abbreviations so often used throughout the text. In spite of these obvious errors, the book should prove highly useful to college students preparing for examinations.

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STUDIES ON INDIAN ITONIDIDÆ (*Cecidomyiidae diptera*). By M. S. Mani. (Records of the Indian Museum, Calcutta, 1934.) Vol. 36, Part IV. Pp. 371-451. (28 Figures and 1 Plate.)

The study of galls interests the zoologist, as most of them are caused by the agency of insects and mites; the botanist, since the host plants often show a specific behaviour towards the causal agencies; and lastly, the plant pathologist, whose labours contribute towards a comparative pathology of tumours and cancers. In Germany, Hedicke, the Berlin Zoologist, Ross, the Munich Botanist, and Küster, the Plant-Pathologist at Giessen, have each shown how galls are worthy of attention. India, with its abundant supply of material for study, offers a virgin ground for the study of galls from all these three standpoints. Mani's monographic study of *cecidomyid* gall producers may be taken as a precursor of many more communications in this field. His study, under review, is not "Notes" or a sketchy study of the material he already found in the Calcutta Museum; he has personally collected most of the specimens described, even adding notes on the life-histories of the insects wherever opportunities permitted him to gather such information. This partly explains why most

of the insects named are derived from South India. We hope, inspired by Mani's example, others would also extend our knowledge of Indian gall-producing insects. Most Indian entomologists have confined their enthusiasm to the field for, when the question of naming new species had to be faced, they preferred acting as exporters for specialists outside to sift through the mass of crude material and thus enjoy the prerogative of creating names new to science giving their own study the stamp of a finished article. Mani has taken on himself such a responsibility and has given to the world several new genera, not to say of new species. A complete bibliography is given and grateful acknowledgment is made to several authorities. While his claim to originality is self-evident, it is equally apparent that a vein of modesty impregnates his style which makes his publication the more agreeable reading. The monograph ends with a single plate, containing photographic reproduction of five kinds of galls whose causal agents have been named by Mani; we only wish there were more of them. His pen and ink illustrations might have been better, particularly Fig. 19 on page 426, hardly does credit to the otherwise excellent study of Indian *Cecidomyids*. S. M.

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A REPORT ON THE PROSPECTS OF PAPER MANUFACTURE IN HYDERABAD STATE. By Md. Moula Baksh, M.A. (Oxon.), F.L.S., and Khaja Nazamuddin, B.Sc., Tech. A.M.C.T. (Manch.) Pp. 71. (H. E. H. the Nizam's Government: Commerce and Industries Department Bulletin No. 4, New Series.) Price Rs. 2-8-0.

This report discusses the advisability and practical possibilities of establishing a pulp and paper mill in the Adilabad District making use of bamboo (*Dendrocalamus strictus*) available in the area as the source of fibre. It has been shown that good paper can be manufactured from these bamboos as is evident from the samples contained in the report.

The total production of paper in India at present is only 45,000 tons a year, while the import for the same period averages about 100,000 tons. All the relevant facts including cost of the raw materials have been discussed in detail in the report with a view to encourage some capitalist to start a factory and we hope that the expectations of H.E.H.'s Government will be realised in the near future. K. A. N. R.

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Creatine et Creatinine par Fernand Kayser (Actualites Scientifiques et Industrielles No. 178. Hermann et Cie, Paris).—This little volume is divided into two parts. Part I is devoted to a description of the chemistry of creatinic substances and Part II to the biophysical studies. A clear and critical review of the existing methods of preparation and estimation, including some of the author's investigations, is given. There is an excellent bibliography in the end. The author complains of the insufficiency of the work done on these substances in France. C. S.

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Metabolismes Des Corps Creatiniques par Fernand Kayser (Actualites Scientifiques et Industrielles No. 179. Hermann et Cie, Paris).—As in the previous number, this book also contains two parts. Part I treats of the metabolism of creatin and creatinin discussing in some detail the occurrence of creatin and creatinin in urine under physiological, pathological and experimental conditions. Part II deals with the pathological conditions only: the variation of creatin and creatinin in the affectations of the kidneys, muscles, the thyroid gland and in certain diseases like diabetes, gout, arthrites, etc. The prognostic value of determining these creatinic substances in the body fluids is indicated. Only eight pages are devoted for the pathological study, perhaps to keep in conformity with the shortness of these monographs. A good bibliography is appended. C. S.

Forthcoming Events.

The Geological, Mining and Metallurgical Society of India:—
Annual General Meeting, Monday, 2nd September 1935, 5-30 p.m.