Science Notes.

Al-Kindl's Theory of Colour of the Sky.—Mr. Zaki Uddin of the Muslim University, Aligarh, writes:—"C. Brockelmann (*Gesch. der Arabischen Literature*, Vol. I. p. 209) has mentioned only a few of the surviving manuscripts of the great Arab Philosopher and Scientist Yaqub b. Ishaq al-Kindi, who has written about 300 treatises on various subjects of science and other branches of knowledge. Out of these manuscripts one No. *MSS. Sed. Arch.*, A. 32, p. 374, preserved at the Bod. Library at Oxford and at Constantinople Aya Sofya Library MSS. No. 4832 is not only important for a student of modern science but also interesting. This MSS. deals with the explanation of the blue colour of the sky, and is the first manuscript available for adding to our knowledge regarding the theory of colour between the age of the Greek Speculators and the famous Arab Scientist, Ibn-al-Haitham (Alhazen with Latin name). Although a number of speculations regarding the cause of the colour of the sky can be found scattered here and there, it was not before al-Kindl that an authentic explanation was given. The important treatise of Aristotle (Opuscula. Oxford 1913) dealing with the General theory of colour does not contain much about this problem.

"Recently the MSS. has been edited and translated into English by Prof. Dr. O. Spies, Professor and Chairman, Department of Arabic, Muslim University, Aligarh, and by me. The translation reveals a number of interesting points and it would be worthwhile to consider and compare the 'old crude ideas' of the ancients with the modern view.

"We know to-day that the colour of the sky is due to the dispersion of the rays of the sun by the atmosphere. This is the result of the investigation of the modern physicists."

When we read in the manuscript of al-Kindl the following, we cannot but appreciate 'one of the twelve greatest minds of the world' (according to Cardano):—

"Now above us, shadowy air has become visible on that what light of the earth and the light of the stars mixes colour in the middle of the shadow and light and that is the blue colour. So it is evident that this colour is not the colour of the sky but it is a thing which is exposed to our sight."

A detailed account of the theory of colour of al-Kindl with the original text and translation will be published elsewhere.

(It would be worthwhile to draw the attention of the students of optics interested in the work of Ibn-al-Haitham to the Corpus of al-Kindl's works discovered by H. Ritter (*Archiv Orientelni*, Prague, 1933, pp. 363–372) and by me at the Oriental Library at Patna dealing with the theory of propagation of the rays of the sunlight. The later MSS. entitled "risála fi mutárih ash-shua" is a copy of an older MSS. of the "madrasah al-Kamilia" at Cairo, and was copied in the 8th century A.H. It would be interesting to publish a translation of the same.)"

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Earthquake in the Panama Canal Zone.—An earthquake shock of great intensity at its origin about 10,200 miles from Bombay was recorded by the Colaba seismographs at 7 hrs. 26 mts. I. S. T. on Wednesday, the 18th July 1934. It appears from the newspaper reports that the shock originated near Costa Rica in the Panama Canal Zone. The earthquake is reported to have caused considerable loss of life and damage to property. A concrete work recently built at a cost of £ 60,000, in Puerto Armuelles was completely destroyed.

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Asiatic Society of Bengal.—An ordinary meeting of the Asiatic Society of Bengal was held on Monday, the 6th August. One of the interesting papers that was presented before the meeting was on the "*Saddharmapaundarika*: A Collection of Central Asian Memoirs of the Lotus of the True Law", by N. Miranov. From his study of the different sets of the Central Asian Manuscripts, the author distinguishes, according to the script, two groups of manuscripts: (1) Those in the *Upright Gupta* Script, and (2) those in the *Calligraphic Upright Gupta* Script. "From the comparison of the different sets with other Central Asian Manuscripts and with the Indian epigraphic monuments, the author assigns the *first group to the 5th-6th centuries*, and the second one to the 7th century. A comparison with Chinese versions permits to assign the recension of the text represented by the 1st group to the 3rd century A.D. and the text of the Calligraphic Upright Manuscripts to the 6th century. Up to the present chiefly manuscripts of the latter group have been published or made use of (like the manuscript of the Bibliotheca Buddhica Edition studied by Kern), those of the first one are comparatively little known.

"The present collection contains the remains of *three* manuscripts in the Upright Gupta Script, whereof one (A = 12N°N° or 25 Frgg.) belongs to the oldest stratum (middle of the 5th century), while the two others (B and C = 20N°N° or 31 Frgg.) are slightly younger going back to the 6th century. The manuscript in the Calligraphic Upright Gupta (D) is represented but by 2N°N° (=7 Frgg.).

"The author has added, in an appendix, the edition of *five* Frgg. of the 'Lotus' from the *Stein* Collection (India Office Library, London), of which two (S. I. S. II), written in the Upright Gupta Script, are three almost complete leaves, while the rest are important from the literary point of view, giving nearly the same text as some Frgg. of the Otani Collection.

"The author has, in his paper emphasised the far-going deviations of the Central Asian recensions, as far as the language is concerned. The manuscripts in the Upright Gupta Script are written throughout in mixed or Buddhist Sanskrit, *i.e.*, represent a Prakrit base overlaid with a faint Sanskrit varnish. Considering the importance of this form of speech of which no Buddhist text is free, the author has compiled a grammar of his texts dealing with both the Phonology and Morphology; he has tried to assign the proper place among the Prakrit languages to the dialect to which Buddhist Sanskrit goes back. Such a grammar will be useful to any student of Buddhist literature, a systematic treatise on the subject being badly lacking. Our present knowledge of Buddhist Sanskrit is confined to a few accidental notes in the editions of Buddhist

texts (not to speak of Rajendralala Mitra's work of the early eighties which is out of print)."

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An Unusual Meteor.—Mr. Zaki Uddin of Aligarh University writes: On Monday, the 23rd July 1934, at 9-30 p.m. an unusual meteor appeared above the clouds that hovered over the horizon of Aligarh. The meteor started from South-West and travelled South-East at about 50° with unusual brilliance, lighting the ground for about 15 seconds. At the beginning it appeared like a ball of fire, that afterwards developed a source of extraordinary light. Later on, it began to emit bright bluish light, and just before disappearing increased in brilliance and split into two portions at about 20° from horizon. It is said to have fallen near Hapur about 40 miles from Delhi. This phenomenon observed was extremely abnormal.

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Sugar Industry in Indin, 1932-33.—Review by R. C. Srivastava.—During the last few years the sugar imports to India have rapidly declined as a result of the growth of Indian sugar industry which has increased the production of white sugar under the very favourable protective tariffs. Almost coeval with the rise of factory industry the 'Khandasari' or open pan system has also expanded and its productive figures have been mounting in the recent years. Results on the agricultural side are also marked. Although the acreage under cane has increased by 10% cane production itself has risen by about 30% which is due to the increasing adoption of improved varieties of cane. An examination of the sugar production figures for the last thirteen years shows the beneficial effects of the tariffs on the industry which has suddenly increased the output of sugar at the closing years of the said period. Also there has been an increase in the number of new factories erected for operation.

Technical and scientific work on cane breeding at the Coimbatore Station has produced several improved varieties of cane now being adopted in the different provinces with success. Some of the varieties CO 281 and CO 290 have been recognised in Queensland and Natal as disease-resisting. Among the other varieties may be mentioned CO 213 in U.P., CO 205, 223 and 285 in Punjab. CO 213 in Madras which have been extensively grown and found to be very satisfactory in the respective provinces.

Total sugar machinery imports during 1932-33 exceeded a crore and a half rupees, nearly two thirds of this amount being spent on British machinery alone. Among the 58 newly erected factories two plants have been entirely built in India and are quite up-to-date.

Due to the recent expansion of the home industry not only have the imports of sugar, both by land and sea, diminished and total home production risen, but there was practically no import of gur or jaggery from neighbouring countries. Java has suffered in her sugar trade by the Indian import duties as also by the Sino-Japanese conflict in Manchuria and England's relinquishing of the Gold Standard. As a result of the accumulation of large stocks measures of restriction of production and centralisation of selling control were adopted. Cuba also had to face a severe disappointment as even the Chadbourne agreement failed to raise the level of prices and Cuba losing a large share of her American market had also to close down 50 out of 183 centrals. As compared with the previous year there was a decline of 3·2% in the total world sugar production there being a 16·4% fall in Europe's beet sugar alone in 1932-33.

The prospect of Indian Industry is hopeful especially in view of the check which the fear of an unhealthy expansion of the industry under very favourable tariffs has received from the new excise duty levied by the Government. The problem, however, of raising the Indian sugar consumption which has remained at a very low figure has still to be faced, otherwise the industry is threatened with the evil of over-production in the course of a few years.

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According to a report in the *Chemical Age* the Maharaja of Kolhapur has granted to a British Syndicate the monopoly of commercially utilising the mineral deposits of the State, especially bauxite. The Syndicate will be formed by the promoters of the scheme and it is said that Sir Basil Blackett will be the Managing Director. An important Aluminium Industry may come into existence in the State.

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A joint meeting of the Society of Biological Chemists, India, and the Grant Medical College Physiological Society was held on Friday, 27th July 1934 at 3-30 p.m. in the Physiology Theatre of the Grant Medical College when Prof. R. H. Dastur read a paper on "The Chemical Mechanism of Respiration".

Major S. L. Bhatia, Dean of the Grant Medical College, presided.

* * *

Biochemical Society, Calcutta.—With the object of the promotion of biochemical studies and research a Biochemical Society has recently been formed at Calcutta. The Society was formally inaugurated on the 6th July at the All-India Institute of Hygiene and a paper on the "Metabolism of Carotene" by Dr. B. Ahmed was read. It has been arranged to hold monthly meetings for biochemical discussions and reading of original papers, reviews, etc.

The first Committee of the Society has been composed of the following:—

Prof. N. M. Basu, Lt.-Col. T. C. Boyd, Prof. Sudhamoy Ghosh, Prof. J. N. Mukherjee, Dr. B. B. Sen, Prof. H. K. Sen, Prof. H. E. C. Wilson, with Dr. B. C. Guha as Hony. Secretary and Dr. B. Ahmed as Hony. Treasurer.

The Society has already evoked an all-round response as the lack of a common meeting ground has been felt for some time by the local workers, and successful meetings are being held. It is hoped that the Society will help to advance the cause of Biochemistry in India.

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Royal Institute of Science, Bombay.—Mr. K. H. Vakil, Member of the Advisory Board of the Institute, specially visited the Institute to inspect the research equipment.

The Institute was closed on 27th July as a mark of respect to the memory of Sir Cowasji Jehangir (Sr.) whose death took place on 26th July at Poona. The late Sir Cowasji Jehangir was one of the three leading persons responsible for the foundation of this Institute, donating altogether about Rs. 7½ lakhs. A condolence

resolution was passed at a meeting of the staff and students.

Prof. Gunjikar (Prof. of Mathematics) is proceeding on a short leave out of India. Mr. S. D. Manerikar, B.A. (Cantab.), will work during his absence on leave.

Dr. N. R. Tawde, B.A., M.Sc., Ph D. (London), A.Inst.P., is appointed Lecturer in Physics.

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Calcutta University.—It is understood that Mr. Syama Prasad Mukherjee, son of the late Sir Ashutosh Mukherjee, has been appointed Vice-Chancellor of the Calcutta University, in place of Sir Hassan Suhrawardy whose term of office expires this year. It is also understood that the Syndicate of the University have recommended that the degree of *Doctor of Science* be conferred on Sir Suhrawardy, retiring Vice-Chancellor, at a special convocation to be held at the Government House in the first week of August.

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Prof. H. E. Watson, lately Professor of General Chemistry, Indian Institute of Science, Bangalore, has been appointed to the Ramsay Memorial Chair of Chemical Engineering at University College, University of London, in succession to Prof. W. E. Gibbs.

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The Tenth International Exhibition of Inventions will be held at the Central Hall, Westminster, London, from October 3 to 13, this year.

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German Association of Men of Science and Physicians.—According to a report appearing in *Nature*, the Ninety-third Meeting of the Association will be held at Hanover on September 16—20. "This is the first meeting under the new constitution and an impressive proclamation of German Science is desired. Exhibitions and Excursions are planned. The Exhibition dedicated to 'Deutsches Volk—Deutsche Arbeit' is to give a picture of the history of German race with emphasis on heredity, genetics and eugenics and also on Chemistry as a domain in which intellectual leadership is fundamental for industry."

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Scripta Mathematica Library.—Scripta Mathematica has in the course of preparation a series of small volumes to be known as "The Scripta Mathematica Library". This series will deal with the history and philosophy of Mathematics and with its relations to the other great activities of the human spirit. Each volume will contain at least 96 pages. Some of the proposed titles are:—(1) Poetry and Mathematics and other essays—by David Eugene Smith; (2) Mathematics and the question of Cosmic mind with other essays—by Prof. Cassius Jackson Keyser, and (3) Fabre and Mathematics and other essays—by Prof. Leo. G. Simons.

Scripta Mathematica also offers to any Library in India, *free of charge*, the following pamphlets. (1) Thomas Jefferson and Mathematics—by David Eugene Smith, and (2) The Meaning of Mathematics—by Cassius Jackson Keyser.

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The Progress of Radio Research: Report of the Radio Research Board for the period, 1st January 1932 to 30th September 1933. His Majesty's Stationery Office, Price 2*s*. 6*d*. net. (Post free 2*s*. 9*d*.)

Knowledge of the work carried out under the Radio Research Board of the Department of Scientific and Industrial Research is essential to anyone wishing to keep abreast of advances in research on the propagation of waves, direction finding, atmospherics, and improved methods of measurement at radio frequencies. The progress of the Board's investigations on these subjects is summarised fully in the recently published Report.

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A new reaction for cantharidine, applicable to its estimation by colorimetry has been described by Georges Deniges in a paper communicated to the Academy of Sciences, Paris. The method is based on the colouration produced by heating cantharidine with formol and sulphuric acid.

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In a paper communicated to the Academy of Sciences, Paris, Vellard has described his observations relating to the periodic destruction of the fauna of the rivers of the Grand Chaco by variations of salinity. "The fish die as the salinity increases through evaporation and are deposited in enormous blocks. This is of interest from the geological point of view as it gives a possible explanation, better than any other hypothesis, of the formation of certain banks of fossil fishes, the origin of which is otherwise difficult to understand."—*Nature.*

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A New Ceramic Ware of Water Absorption of Nil.—"No property of Stoneware," says Felix Singer (*Chemical Age*, 1934, **30**, 553), "is of such decisive importance for many of the purposes of the Chemical Industry as its degree of water absorption." The production of a new English ware "Alchemie" (by Doulton and Co.,) with no absorption at all, can therefore be considered as an achievement of first importance in Chemical Industry. In spite of the reputed and resisting properties of Stoneware, its extensive use was limited by the water-absorbing property it possesses. The production of "Alchemie" has now made possible the employment of the ware, freely, in foodstuff industries, in all processes where use is made of hydrogen peroxide or other *per* compounds, in the manufacture of taps and such other plant accessories, in chemical works and in several other industries where stoneware is usually considered the best, nay, the only material that can be used for certain apparatus.

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We acknowledge with thanks the receipt of the following:—

"Nature," Vol. 133, Nos. 3371 to 3375.
"The Chemical Age," Vol. 30, Nos. 780 to 784.
"Canadian Journal," Vol. 10, Special Number and No. 6.
"The Journal of Chemical Physics," Vol. 2, No. 6.
"Berichte der Deutschen Chemischen Gesellschaft," 67 Jahrg, Nos. 6 and 7.
"Natural History," Vol. 34, No. 4.
"Journal of Agricultural Research," Vol. 48, Nos. 5 and 6.
"Experiment Station Record," Vol. 70, No. 5.
"American Journal of Botany," Vol. 21, No. 6.
"Journal de chimie Physique," Tome 31, No. 5.
"Science Progress," Vol. 29, No. 113.
"The Science Forum," Vol. 1, Nos. 1 and 2.
"The Journal of Nutrition," Vol. 7, Nos. 1 to 6.

"The Review of Scientific Instruments," Vol. 5, No. 6.
"Scientific Indian," Vol. 11. No. 66.
"Indian Forester," Vol. 60, No. 7.
"Medico-Surgical Suggestions," Vol. 3, No. 6.
"Forschungen und Fortschritte," Jahrgang 10, Nos. 17, 18 and 19.
"Journal of Agriculture and Livestock in India," Vol. 4, Part III.
"The Indian Journal of Veterinary Science and Animal Husbandry," Vol. 4, Part II.
"Indian Forest Records," Vol. XX, Part 6 (Entomological Series).
"The Indian Trade Journal." Vol. CXIII, No. 1462 and Vol. CXIV, Nos. 1463 to 1465.
Govt. of India Publications: "Forest Bulletin" No. 83 (Sylvicultural Series) 1934.–Provisional yield Table for *Quercus incana* Roceb.
Department of Commercial Intelligence and Statistics in India: "Monthly Statistics of the Production of Certain Selected Industries of India," March 1934, No. 12.
"Journal of the Institute of Brewing," Vol. XL, No. 7.
"Scripta Mathematica," Vol. 2, No. 3.

Reviews.

RASSENKUNDE UND RASSENGESCHICHTE DER MENSCHHEIT. By Egon Freiherr von Eickstedt. (Stuttgart. 1934). Price RM. 76·50.

The number of really authoritative text-books on Anthropology issued so far is relatively small and it has, therefore, been a matter of great difficulty for workers in this science to get together the necessary information except by wading through a great deal of scattered literature in not easily accessible scientific periodicals and various manuals. Martin's "Lehrbuch" of which a second edition was published in 1928, Saller's "Leitfaden der Anthropologie" (1930) and Wilder's "A Laboratory Manual of Anthropometry" (1920) are amongst some of the most authoritative publications, but still there was the necessity for an up-to-date and carefully prepared work dealing in detail with the very important questions of the different races of mankind and their history. Such a work is the one under review, published by Prof. von Eickstedt of Breslau University. This handbook differs from the older works in that it contains as exact and detailed an account as possible of the complicated question of the races of mankind, based on a careful study of the extensive literature and the personal researches of the author not only in the laboratory but also in different continents. In addition to dealing with the races under four major groups, *viz.*, Asiatic, European up to Sahara, Negroid Africa and Oceania and the two Americas, the author has dealt with in detail the development of the various epochs of the history of the different races and their connections with the continental and other changes. The author carried out a great deal of anthropometric measurements of the various races and more particularly of the primitive tribes of India, and though one may not agree with all his conclusions, the information in reference to these tribes, which is incorporated in the volume, would prove invaluable to students of Anthropology in India.

The publication is beautifully illustrated and the large number of specially prepared maps add greatly to the value and importance of the work. It should create a great deal of interest in anthropological studies for the carrying out of which correct lines are indicated.

B. P.

ELEMENTARY DYNAMICS. By R. C. Gray, (Macmillan & Co., Ltd., pp. xi+211, 1934.) Price 5*s*.

The author in his preface states that the book is intended for students beginning a University course in engineering or other applied science and that the subject is treated as an introduction to applied science and not as a branch of mathematics. The book deals in a particularly clear and simple manner with the essential portions of particle and rigid dynamics. The introduction of a few of the topics usually dealt with under statics and a chapter on gyroscopes form a welcome innovation. The treatment is anything but hackneyed and there are very few books of this sort which keep an eye to the practical applications of Dynamics in Engineering. The examples have been very carefully chosen, but one cannot get over the feeling that the majority are unnecessarily too numerical.

In such a well-trodden field where there is a bewildering variety of text-books differing from each other in their content as well as method, it is very difficult to assess the value of any new book on the subject. This book, based as it is on the syllabus of