

REVIEWS

Kunstliche New Elemente. By Otto Hahn. (Verlag Chemic, GMBM Weinheim/Berstrasse, Berlin), 1948. Pp. 50. Price D. M. 2.50.

The discovery of the fission of uranium and the possibility of chain reaction led Fermi to the development of a device now known as the "Uranium Pile" in which the chain reaction could be controlled and sustained. Such a pile serves as an extremely powerful source of neutrons with the help of which it has now become possible to prepare weighable quantities of any element (stable or radioactive) by artificial transformation. This monograph contains a brief account of eight new elements which are of great interest from the chemical point of view. It has been written by one who is an authority on nuclear chemistry.

The book is roughly divided into five sections. In the introductory section, the author traces the history of the development of nuclear physics. In the succeeding section, starting with the early experiments on the neutron bombardment of the heavy elements, especially uranium and thorium, carried out by Fermi on the one hand and by Hahn, Meitner and Strassmann, on the other, the author describes the crucial investigations of Hahn and Strassmann and of Curie and Savitch which finally culminated in the discovery of the fission of the uranium nucleus into roughly two equal parts. The discovery of the emission of secondary neutrons following uranium fission and the possibility of a chain reaction are discussed in the third section. The essential details of the construction and working of the "Uranium pile" are also given in the same section. The fourth section is on artificially prepared new elements. The various methods of preparation in small as well as in large quantities and the properties of eight new elements are given.

They are:—

(1) element 43, Technecium (Tc), (2) element 61, (3) element 85, Ekaiodine or Astatine (At), (4) element 87, Fracium (Fr), (5) element 93, Neptunium (Np), (6) element 94, Plutonium (Pu), (7) element 95, Americium (Mm) and (8) element 96, Curium. (Cm).

In the concluding section, the author has given some pertinent remarks on the position which the transuranic elements occupy in the periodic system.

The subject-matter of the book is presented in a simple and easily readable form. The book though written in German will be very handy for workers in the field of nuclear physics.

R. S. K.

One Story of Radar. By A. P. Rowe. (Cambridge University Press, Cambridge), 1948. Pp. xii + 208. 8sh. 6d. net.

The years since the close of World War II have been remarkable for the number of popular and semi-popular books on atomic bombs and nuclear energy. This over-emphasis on one aspect of research has been responsible, more than any other single factor, for the impression steadily gaining ground in the

public mind that scientific endeavour, irrespective of the motive urging the investigators, spells speedier march towards the destruction of modern civilization, if not of mankind. 'One Story of Radar' tends to correct this impression by presenting the picture in its proper perspective. It is worthwhile noting here that the author is of opinion that "few in a position to judge would hesitate to name the cavity magnetron as having had a more decisive effect on the outcome of the war than any other single scientific device evolved during the war. It was of far more importance than the atomic bomb, which had no effect at all on the outcome of the German war and contributed rather to the shortening of the Japanese war than to its result," and that "Had there been a scientist in the Victory Parade, he might well have carried on his banner the inscription: "My profession saved a million lives."

The book traces the history during the fateful decade following 1935, of the fortunes and vicissitudes of the Telecommunications Research Establishment (T.R.E.) in its wanderings from the lovely "Island"—actually an isthmus—of Orfordness and its neighbour the Bawdsey Manor on the east coast of England through Worth Matravers and Swanage in the South to Malvern College in central England, with a depressing but brief halt at northern Dundee thrown in between. The narrator is its own Chief Superintendent. The progress achieved by T.R.E. within this period can be gauged to some extent by observing that the Establishment which started by demonstrating a radiolocation gadget "that could measure the height of an aircraft flying at 7,000 ft. with an error of little more than 1,000 ft." was responsible eight years later for placing at the service of the Bomber Command a device known as the Oboe whose operators "sitting in comfort in England, could follow with great accuracy the track of an aircraft as it flew over a target 250 miles away, could calculate its speed" and could signal it when to release the bomb load on the target with an error not exceeding a few hundred feet. The thousand bomber raids over the Ruhr area in 1942-43 could not have been successfully organised without the aid of an appliance such as the Oboe. This progress followed closely on the heels of the development of Oliphant's klystron and the magnetron, the two devices that pushed the shortest wavelengths at which electro-magnetic waves could be usefully handled and generated from a couple of meters in 1935 to a few centimeters by 1942. The measures and counter-measures adopted in the Bay of Biscay submarine warfare indicate that that struggle might appropriately be termed the battle of wave lengths in which the contestants were the scientists of the opposing sides.

The author makes no attempt whatever to weary the reader by dwelling on the technical details pertaining to radar appliances, as there is an abundance of literature on such

topics available elsewhere to the inquirer so interested.... On the other hand, he gives an eminently readable account of the circumstances and the military need that gave birth to the idea of a new radar appliance, of the pursuit of that idea and its subsequent culmination in the form of a laboratory instrument, of the conference table at which Civilian Scientists and Military Chiefs had to decide whether the baby instrument should die without a progeny or be permitted to evolve into a prolific race of factory built models and in the latter event, of the modifications to be incorporated so as to meet the requirements not only of large-scale production methods, but also of a modicum of secrecy and finally of its use in military operations and the part it played in shaping the future course of War. The success of such a scheme depended on the speedy and whole-hearted mingling of the variegated patterns of mind and habit of the men concerned. It is therefore not surprising that the author does not tire of repeating the importance of the creation of team-spirit among the workers of T.R.E. or of the unceasing effort that T.R.E. made to interpret the scientist to the user and the user to the scientist. As he truly observes, "the war might well have taken a different course and would certainly have cost us more dearly if the Service user and the radar scientist had got together in Germany as they did in this country."

It was inevitable that these men should resort to some method of relieving the intense emotional strain under which they lived and worked. That one of these methods was the christening of their creations by odd yet piquant names reveals a human and lovable side to their character. To give a few instances, the Plan Position Indicator that enabled the pilot to home on to a target was named H₂S—abbreviation for Home, Sweet Home, we are told—(not for the nasty smelling gas?); the components of the Oboe, whose tunes wafted the aircraft to its destined target, were named the Cat and the Mouse; the Eureka and the Rebecca were the names selected respectively for the Radio Beacon established by the landed paratroops and for the receiver installed on the aircraft carrying further reinforcements; and not to be beaten by the mere scientist, the Air Force gave the Research men who pestered it incessantly with their demands to be consulted and heard, the pet name 'Boffins', while the informal conference at which the Military and Scientific officers wrangled vociferously was named the Sunday Soviet.

The reviewer has one grievance against the author. In the chapter on "Some Memories and Features of T.R.E.," he gives an account, as instructive as it is delightful, of the elaborate precautions they would take to ensure that their Visitors' Days should be impressive. Before being taken round the establishment, the guests would be shown coloured diagrams and training devices displayed in the Office-Room and the Hall of Magic. A selection of these illustrations in the form of a few more plates supplementing the existing seven

plates would have materially added to the attractiveness of the book. A perusal of the book would convince any reader that Mr. A. P. Rowe's efforts in this direction could not but have been distinctive. A printer's error, minor in itself, but likely to confuse some readers intrudes on p. 204 where 'inadequate' is printed where as obviously 'adequate' was meant.

This is a book that has a message of deep import for the scientist and the general public as also for the Civilian and Military Administrative Chiefs. It is to be hoped, in particular, that the Telecommunications Research Laboratory that is to be shortly opened at Jubbulpore will not fail to be benefited by the experiences of the British T.R.E.

R. L. N.

Velocity Modulated Thermionic Tubes. By A. H. W. Beck. (Published by the Cambridge University Press), 1948. Pp. x+180. Price 15s. net.

The timely publication of this volume which presents a general introduction and principle of operation of V.M. tubes adds greatly to the fund of scientific knowledge and indicates a great scope of research in this newly developed line. The treatise aims at building up theories from simple postulates and attempts to present a realistic picture of the subject. Suggestions for further scope of work deserve special attention.

Starting with historical introduction and status of V.M. tube art before World War II, the first two chapters devote to the theory of cavity resonators from the standpoint of vibration modes of oscillating mechanical systems, theory of V.M. process for small signal, etc. In Chapter three, calculation procedure for output efficiency of a klystron oscillator as a function of the ratio of starting current to running current has been outlined. Chapter six is an extension of chapter three and presents a large signal theory sufficiently adequate for engineering purposes. The problem of focussing electrons through different types of tunnels is an important feature in klystron design. This is discussed in Chapter four. The fact that coupling of extra resonators to the same beam increases gain much more than that of a simple V.M. power amplifier, induces chapter five to emphasise that the development of multiresonator system will be of great help to the stable frequency microwave communication system. Chapter seven deals with the theoretical aspects of reflex klystron. It is pointed out that though the large dissipation in resonator surface and difficulty of arranging a smooth control of reflector characteristics present a serious handicap for the manufacture of high power reflex klystron, the possibility of obtaining higher frequencies creates a good promise for this type in receiver design. Discussing about the less well known embodiments of V.M. ideas Chapter eight suggests a great scope for research in microwave valve mixers. The interesting discussion presented in Chapter nine about oscillation hysteresis, modulation problems etc., indicates a clue for both theoretical and experimental development. The last chapter presents in a qualitative way the main consid-

ration that should be taken into account when designing a V.M. tube. The example worked out in Appendix 1 on the design of a high power C.W. klystron is highly instructive and helpful. Appendix 2 gives a brief analysis of travelling wave tube which promises to play a great role, especially, where large gain associated with wide band width is desired.

The volume under review like other Modern Radio Technique series publication, will serve as a very useful addition to the existing knowledge of microwave technique. This book is highly recommended to those engaged in microwave research on both fundamental as well as design aspects.

S. K. C.

The Diary and Sundry Observations of Thomas Alva Edison. Edited By Dagobert D. Runes. (Philosophical Library, New York), 1948, Pp. 247. Price \$ 4.75.

The selections from the notes, statements and observations of Thomas Alva Edison, which comprise this handy volume of 240 pages, bring out the personality and greatness of "one of the world's greatest benefactors", who initiated the electro-industrial era of our time. There is perhaps no one who has passed through a school that has not read or heard of Edison. While not a few of the thousand inventions which bear the impress of his skill and ingenuity are widely known and their benefits widely enjoyed, the knowledge relating to the man himself, his life and work, is not widespread. The Editor of the collection must be congratulated for bringing together representative selections from his numerous writings, which give a glimpse of his personality, and for making them available to the general reader.

In the book under review, the reader is taken through "a fascinating trip into the unknown as it were," and provided an opportunity to witness the working of the ever alert, eminently practical mind of an experimenter deliberately searching out new paths and new ways into the mysteries of nature. The inventions of Edison are not the results of brain waves; they were products of intense thinking and systematic experimentation. He was entirely self-made and self-educated. He did not hold any sinecure jobs with fat emoluments. He was drawn into experimenting and inventing inevitably as it were by the sort of discipline which he chose to give himself. He had no illusions about the lot of the inventor.

This is what he says about the inventor:—

"The inventor tries to meet the demand of a crazy civilization. Society is never prepared to receive any invention. Every new thing is resisted, and it takes years for the inventor to get people to listen to him and years more before it can be introduced, and when it is introduced our beautiful laws and court procedure are used by predatory commercialism to ruin the inventor. They don't leave him even enough to start a new invention." This was the lot he chose for himself, and his whole life is an object lesson in plain living and high thinking.

The Diary, covering 59 pages, gives a glimpse of Edison's daily life. His reading was voracious. He would read fiction and immediately switch on to the study of a journal of higher mathematics. His prescription for steady-ing nerves was the study of *Encyclopædia Britannica*. He read New York World for his mental breakfast and glanced through accounts of murders "to keep him in touch with human affairs." He read Goethe to lull him to sleep. When he entered a book shop he found a thousand books that he wished to read. He did not read just a few books but read whole libraries. "Almost any book will supply entertainment or instruction," he says. He was deaf but he was not only not over-powered by his deafness, but he deliberately planned to develop the other gifts with which he was endowed. The deafness, for instance, did not prevent him from hearing the clicking of a telegraph instrument when he was near it, as an operator always must be. In fact, his deafness proved to be an advantage; it made him immune to the outside distracting noises. He was cut off from "that particular kind of social intercourse which is small talk", and thereby found freedom to think out his problems. "The things that I have needed to hear, I have always heard," he says and continues "Most of the nerve strain of our modern life, I found, comes to us through our ears". To him Broadway was a peaceful thoroughfare. His inventions made it possible to build a world "in which the person who is deaf will have a definite advantage". Here is a personality, who not depressed by the loss of hearing, turns it into a positive asset. It illustrates in a most eloquent manner, Edison's outlook on life, and no wonder, his life was full of achievement.

There are in Edison's writings, many tracts of wisdom, many correctives for man's failings and weaknesses, and many suggestions for educationists and social workers. His optimism in the future prosperity and greatness of America is robust. Educational developments, he believes, will help in raising a better and progressive generation of citizens and parents, leaders, scientists and business managers. Whatever he writes, whether it relates to ethics or education, music or philosophy, is direct, clear and precise, revealing a master expounding his thesis in a simple and lucid language. This is a book which every one ought to read. There is much in it that is original thought-provoking and instructive. There are few books to compare with it which can be read with both pleasure and profit.

B. N. SASTRI.

Animals Alive. By Austin H. Clark. (D. Van Nostrand Co. Inc., New York, Macmillan & Co. Ltd., London), 1948. Pp. viii+472. Price \$4.00. Sterling Price 22s. net.

Considering that Zoology is a serious subject, the book under review which deals with the Animal Kingdom as a whole in relation to man and his physical universe is a welcome addition to our general or natural history Libraries.

The test of popularity of any serious publication does not lie merely in the number of copies sold or in the number of editions it has gone through or in its moderate price, but in the avidity and zest with which an average reader can return to it again and again. Judged by this test, "Animals Alive" ought to prove a good seller and have an appeal to the lay general reader as well as to the specialist. Zoology, as presented in text-books, is not usually a subject that can have an universal appeal. Not all serious students of Zoology would care to read a text-book more than once were it not for the fact that there is usually an examination to pass. While "Animals Alive" reads like a novel, it is in fact a general text-book of Zoology shorn of its annoying and difficult technical terms in Latin and the irksome and uninteresting details of structure and function.

The purpose of this publication, as stated by the author himself in the preface, is to answer in an intelligible way questions which may arise in the mind of the general reader without special technical knowledge in reference to the relationship of the animal world to man and of the various types of animals to one another and to the plants and their physical environment on land and water, and the relationship of the living world to our universe as a whole.

The book is divided into four parts. The first part deals with man and the animal world, the second with land animals, the third with freshwater animals, and the fourth with life in the sea. Each part is divided into a number of chapters the longest of which does not exceed 20 pages and the shortest does not fall below 4 pages, the average length of a chapter for the whole book being eleven pages. Brevity of chapters is an advantage to the slow and deliberate reader who desires to enjoy as he unconsciously assimilates. It stimulates without tiring the reader.

Within the space available for a review of this kind it will not be possible to touch upon anything but a fraction of all the interesting details of animal life with which the book is packed. The association of man with the animal world has a long historic background, and "a true understanding of the latter is not possible without, first of all, a somewhat detailed appreciation of man's most intimate contacts with it, especially with those numerous and varied types which have been brought under domestication and those more numerous and more varied types against the depredations and attacks of which he must be constantly on guard." The number of domesticated animals which have descended from ancestors of Asiatic origin seems to be unexpectedly large. The dog, the horse, the sheep and goats, the pig, the humped cattle and the yak, the camel and the elephant, the barn-yard fowl and geese, the pigeon and the peacock, all appear to have such origin.

The chapters dealing with animals of all classes which are of some importance to man or are obnoxious to him or his domesticated animals are by far the most interesting, and make reference to the honey bee, the silk worm, the lac insect which derives its name from lakh with its Sanskrit derivative "laksha" from the fact that they are abundant wherever found, the

fur-bearing land animals, and the sea animals which provide him with food and other economic products. These chapters are literally packed with rare and interesting observations, a few of which may be mentioned here: Mosquitoes occur in the Arctic regions in millions, while some feed on gorged bed-bugs and suck blood from the backs of turtles. The mosquito-fly or human bot-fly is known to attach its eggs to a female mosquito to enable the little maggots to enter into the puncture made in man or mammals by the mosquito where it lives until fully grown and ready to pupate in moist soil. Very few would fail to be surprised to know that there are insect predators which chew metal or minerals in the same way as our sophisticated moderns chew gum, omnivorous saw-toothed grain beetles which do not scorn to live and breed in red pepper or chillies, bore into cigars and cigarettes, and eat snuff.

Chapters 7 & 8 of Part I contain some of the most interesting and weird facts about the food and feeding habits of man and animals in various parts of the world. It would be shocking to the most refined and confirmed non-vegetarian in India, peopled by innumerable primitive tribes with a wide range of animal menu to their credit, to learn that the skin of certain whales, the stomach contents of the Greenland reindeer, the dried grasshoppers, the luscious queens of Indian termites, the pickled beetle grubs of Mexico, the pupæ of silk-worm moths and even the baked centipedes of Polynesia are considered delicacies by some people in some parts of the world.

Apart from finned, hooped and winged animals of all kinds on land and water, man has included in his dietary a great variety of the lesser known vertebrates and invertebrates. Among the vertebrates may be mentioned the tapirs, ant-eaters and sloths, porcupines and armadillos, pumas and monkeys, bats, the large reptiles like the iguanas, crocodiles, sea and land-snakes, and the salamander. Even the lancelets and sea-squirrels which are considered distant relations of vertebrates are fished for food in China Seas and the Mediterranean Seas respectively. Among the invertebrates are the squids, sea-urchins, bristle and other sea-worms, barnacles, jelly-fishes, and sea-anemones. We have the testimony of the author himself who has had the courage to verify that the claims as to taste and nutritive value made for some, at any rate, of the formidable array of food items mentioned in the book, are not exaggerated. The author has also marshalled facts to prove the truth of the saying "one man's food is another man's poison", and to show that there can be no death from starvation in many parts of the world if only the human palate can be educated to relish the wide range of dietary provided by nature.

An appendix is provided at the end of the fourth part dealing with the classification of animals as under: 1. bilateral symmetry, 2. animals with mixed symmetry (bilaterally modified by more or less evident radial symmetry, often most obvious in the nerves), 3. animals with radial symmetry, 4. unorganised animals, 5. singlecelled animals. There is an unusually good index covering 37 pages

but unfortunately this does not include the alliterative *onomatopoeia* on p. 48 which no standard English dictionary explains

The book is illustrated with clear black and white drawings of examples of most groups of animals dealt with in the book. One wishes that the feeding of the African caterpillar described on p. 131, and the S. American *Mata-mata* referred to on p. 218 had been figured.

The reference to the food-collecting mechanism of the sponges and to the boring habits of some sponges does not seem to accord with the classification of the Sponges as an unorganised group and with the more or less accepted view that Sponges constitute a separate sub-kingdom (Parazoa) equal in rank to that of the Protozoa or the Metazoa.

The freshwater jelly fish, *Limnocnida* common to Africa, India and China, to which no reference is made, seems to be better known in S. Eastern Asia than *Microhydra*. What has been stated about the breeding of the Indian elephant is generally true, but it may interest readers to know that one or two cases of domesticated Indian elephants breeding in the Andaman islands are recorded.

The excellence of the paper, printing and get-up of the book is somewhat marred by a number of printer's errors on thirteen pages (Pp. 3, 15, 69, 78, 128, 316, 362, 379, 384, 400, 429, 432, 433). It is hoped that in reprinting this excellent and readable book on Zoology the publishers will rectify the errors and endeavour to maintain the reputation of the publishing trade in U.S.A.

Notwithstanding the few errors of commission and omission no general or specialist library in India can do without this book on its shelves.

H. S. R.

Oncidium. By P. R. Awati and K. R. Karandikar (Zoological Memoirs¹ The University of Bombay), 1948. Pp. 53. Price Rs. 3.

From Lucknow, a series of memoirs on Indian animal types was being published with the object of familiarising the zoology students of Indian Universities with Indian examples. The Lucknow editors have not yet exhausted the list of specimens they drew up to describe when the University of Bombay has projected a memoir on *Oncidium* with the same object of putting before the students of zoology, particularly that of Bombay University, descriptions of Indian types. While we welcome correct and comprehensive accounts of as many Indian examples as possible, we only hope that there will be no duplications.

The memoir, under review, deals with the anatomy, bionomics and embryology of the marine pulmonate slug, *Oncidium*. The systematics of the example are described in Section A and unfortunately nowhere do we learn the name of the founder of the genus or of the species of *Oncidium*.

Section B deals with external morphology. It would have been excellent if the publishers had reproduced Figures 1 and 2 as plates or even better, if the authors had given a coloured plate or plates, indicating suitably the size of the animal drawn.

In describing the histology of the radular support, the authors refer to a cellular body of polygonal cells with nuclei. A discussion of the nature of this tissue would have been most welcome.

In Figs. 7 and 21 the opening of the hepatic ducts are described as 'Liver openings' and 'opening of the Liver-gland' respectively. The authors themselves refer to three hepatic ducts on page 23, and instead of leaving the student in doubt, they could have clearly indicated in the figures, the openings as those of hepatic ducts.

The 'cell membranes' are noted to be not discernible in the pulmonary tissue. If the cell outlines are not seen even under high power of the microscope, it is not discussed if the syncytial tissue is helpful in gaseous exchange. The student will be anxious to know how the animal inhales air and the mechanics of respiration which is not described in any text-book may, therefore, have been given in detail.

The ventricle is described as 'thickly set muscular organ' and also that 'Its inside is filled with muscle-bands....' The description would have been better understood if these bands were incorporated in Fig. 35.

In a number of places in the text, a reference is made to 'body cavity' and the student will be able to comprehend better, if a connected account of the hæmocœl and hæmocœlic canals or sinuses and the cœlom was given, like all other systems, separately.

The early cell-history during development is described but the nature of the yolk content and of cleavage are not included. At any rate, figure 55 shows four unequal micromeres derived from four equal blastomeres.

The get-up of the book leaves much to be desired. References are frequently misquoted, (page 4, 40 Watson, 1926; page 6, 14 Plate, 1892) or completely omitted (Berge, 1882). The reference list on page 53 could have been arranged with greater care. A few of the devils amongst others, are given below which could have been easily avoided: p. 4, medium for median; p. 14, cartilagenous for cartilaginous; p. 26, diaphragum for diaphragm; p. 53, Harvard for Harvard, and Joyeux-Laffuic is written in at least three different ways (p. 12, 50).

The usefulness of the memoir could have been considerably heightened if these shortcomings had been envisaged particularly as it is meant for the students.

L. S. R.

Mysore Geological Department Records, XLIV, (1948).

The Director Mr. B. Ramarao summarises in the first article, the activities of the Department for the year 1945 wherein statistics of the production of minerals both by the department and private agencies with their values are recorded. The Mysore Geological Department have been pioneers in the country in taking up utilisation and prospecting work as supplement to their survey work and their activities as recorded by the Director, serve as an example to the other Geological Surveys in India and States.

In the second Chapter Mr. B. Ramarao contributes a paper on gold investigations in Mysore and gives an excellent summary of the gold mining activities, and more particularly of the recent and current attempts of the Geological Department to reopen some of the ancient mines. In a diagrammatic representation showing the percentages of gold production of each of the principal producing countries in the year 1940 it is shown that Africa produced about 41% of gold. Europe about 12%, Asia about 9% (of which India's share is 0.7%), Australia about 6%, Central America about 5% and North America about 27%. Almost all the gold produced in India goes to the credit of Mysore State. An excellent case has been made out in this paper for extending prospecting operations to other promising areas not only in the State but also in other parts of India.

Mr. Lakshmana Rao's paper on the road metals and lesser minerals details suitable quarry sites for building material and road material and on the occurrence of some economic minerals like lime kunkur, clays, corundum, quartz and felspar.

Mr. M. B. Ramachandra Rao's contribution on 'Geophysical Prospecting for Graphite' has a negative value in that it finds that the results of geophysical prospecting give no indications of workable deposits. Mysore Geological Survey Department also leads the rest of India in having introduced geophysical methods for engineering and prospecting problems and Mr. Ramachandra Rao has already a fine record of work to his credit in Mysore and elsewhere in this direction.

The last paper is a 'Note on Bowenite and Talc picrolite from 'Holinarsapur area' by Mr. Tirumalachar.

This record, suitably illustrated by diagrams, maps, and plates keeps up the traditions of the publications of the Mysore Geological Survey Department.

C. MAHADEVAN.

Eradication of Water-Hyacinth and Production of Compost Manure. By Megh Nath Basak. (Brochure issued by the Directorate of Agriculture, Government of West Bengal).

In this brochure, Mr. Basak has drawn attention to the urgent necessity of securing complete eradication of water-hyacinth from the Provinces of Bengal and Assam. Not only has the extensive occurrence of water-hyacinth rendered navigation in many parts of the Provinces hazardous, and affected agriculture, a conservative estimate placing the annual loss of deep-water paddy due to deprecation by the weed at eleven crores of rupees, but also has raised acute problems of water pollution and public health.

Various methods suggested, in the past, for eradication of the pest have, in practice, not been successful owing to the heavy financial burden they involve. The manufacture of different substances, such as starch, fibre, paper-pulp, etc., from water-hyacinth has also not proved economically feasible.

During 1946, composting of hyacinth, by improving Dr. Acharya's 'Bangalore' Method to suit local conditions, was carried out at selected centres in Bengal under the supervision of Mr. Basak. In the light of experience gained then, he has advocated production of compost from hyacinth all over the Provinces as a means of eradicating the pest, at the same time securing a valuable manure. Extensive data have been cited to show that the sale of the composts produced would more than compensate the cost of the production.

While further information regarding the extent by which incidence of the pest has been brought down in the areas where composting was carried out in 1946, and also regarding the response of crops to hyacinth-composts, would have been particularly useful, the publication of the pamphlet is to be welcomed as showing a way of tackling the problem. Success in this direction lies in a concentrated effort by the Governments and Public Organisations, no less than by private agriculturists.

C. R. H.

INDIAN STANDARDS INSTITUTION CHEMICAL DIVISION

MORE than one hundred and ten chemical manufactures have already been referred for purposes of standardisation to the Chemical Division Council of ISI., which was inaugurated today in New Delhi by the Hon'ble Dr. Syama Prasad Mookherjee, Minister for Industry and Supply.

The Council on which all the units of chemical industry in India are represented has elected Dr. H. L. Roy of the College of Engineering and Technology, Jadavpur (Bengal) as Chairman.

Pointing out the fact that Indian industry had offered maximum co-operation with the Indian Standards Institution in all its aspects of work, the Hon'ble Dr. Mookherjee observed that while the Government realised their ultimate responsibility in respect of legislation for enforcing standards, industry's helpful attitude in this matter proved that, meanwhile standards could be fixed and enforced by

mutual co-operation between the Government and industry. The establishment of the Chemical Division could help to raise the standard of production, he said, not only in the chemical industries themselves but in all those other industries which depended on the utilisation of chemicals.

It was pointed out at the meeting of the Council that besides the 110 odd subjects proposed by members of ISI for the attention of the Chemical Division, the latter was also interested in the work of the International Standards Organisation relating to a number of items such as petroleum products, varnishes, paints, etc., rubber,—plastics and general definitions relating to Chemical and Physical Test Results. The Chemical Division will take over the organisation of the secretariat for the International Standards Organisation's Committee for Shellac.