

REVIEWS

The Velocity of Light. By N. Ernest Dorsey, of the National Bureau of Standards. (*Transactions of the American Philosophical Society*, Philadelphia, Vol. 34, Pt. I), 1944. Pp. 110, Figs. 20. Price \$2.25.

As is well known, the finite velocity of light in its travel through space was first established from astronomical observations. The possibility of determining this fundamental constant of Nature by terrestrial and even in laboratory experiments naturally suggested itself. The first successful determinations of this kind were made in 1849 by Fizeau and by Foucault in 1862. The former used the toothed wheel method and the latter the method of the rotating mirror, descriptions of which will be found in any text-book on Optics. Fizeau's first determination was only a rough estimate, while Foucault found the value 298 megametres per second, which is within one per cent. of the value accepted at the present time. These methods, with various improvements, have been used by subsequent investigators in an effort to make a really reliable determination, *viz.*, Fizeau's method by Cornu (1872, 1876), and by Perrotin and Prim (1908), and Foucault's method by Newcomb (1880-82) and especially by Michelson (1878, 1879, 1882, 1924 and 1927) and by Michelson, Pease and Pearson (1935). A fundamental variation of the Fizeau method was initiated by Karolus (1925), the toothed wheel being replaced by a Kerr electro-optic cell. This new method has been used for definitive determinations by Karolus and Mittelstaedt (1929), Anderson (1937, 1941) and by Hüttel (1940). All these four determinations agree closely, the mean value for the velocity of light in vacuum being 299·773, the uncertainty not exceeding a few units in the last decimal place. Precisely the same result was given by the work of Michelson, Pease and Pearson, in which the velocity of light was determined in an evacuated tube, about a mile long. It is interesting to notice that the earlier determinations of Newcomb (1880-82) gave the mean value 299·78, though the uncertainty was greater, and that Michelson's successive determinations, except the very first preliminary one, made a progressively closer approach to the now accepted value.

Mr. Dorsey in the volume now under notice has made a thorough critical review of all the published investigations. His comments make it clear that all the earlier investigations prior to 1924 were affected by various uncertainties and systematic errors, and must, therefore, be considered as of historic interest only. The detailed discussion leads to the definitive value stated above. Incidentally, it is shown that the suggestions that have been put forward that the velocity of light in vacuum has progressively diminished (!) during the last century are absolutely without physical foundation.

The monograph is a most scholarly and useful production.

C. V. RAMAN,

Everybody's Political What's What? By George Bernard Shaw. (Constable, London), 1944. Pp. 366. Price 10 Sh.

Notice of a book by this evergreen entertainer would scarcely have reached these columns but for a savage attack on science and medicine which must not pass without remark. Nobody with an open mind will quarrel with his quarrel with (1) any form of inoculation and (2) Pavlov's experiments on dogs: but to limit his review of science to these isolated and admittedly debatable subjects is, in the words of the Scots minister who prayed for rain, "fair rideeculous". There is no mention of the work—from which Mr. Shaw will have unconsciously benefited in his long life even more than an appreciative public has profited by Mr. Shaw's—of Faraday, Pasteur, Perkin, Marconi and the host of ancillary chemists, engineers, physicians and surgeons who have rendered more tolerable the day-by-day conditions of existence within the last hundred years.

To avoid all misunderstanding, however, it must here be said, and said with gratitude, that the book is a joyous feast of typical Shavian slapstickery which merits the closest attention of Mr. Everyman and Mrs. Everywoman. Because, embedded in the quartz of irony and impudence there runs the gold of wisdom and commonsense, bedecked with rollicking good humour and a kindness of heart which Mr. Shaw, rather coyly, permits to emerge from time to time. How pleasantly this contrasts with the current mood of his co-sage, Mr. H. G. Wells.

It is all the more regrettable, therefore, that Mr. Shaw should write (p. 190), "I, an artist-philosopher, mistrust laboratory methods because what happens in a laboratory is contrived and dictated. The evidence is manufactured; the cases are what newspaper reporters of police cases call frame-ups. If the evidence is unexpected or unaccountable it is remanufactured until it proves what the laboratory controller wants to prove." This calumny shows that even Mr. Homer-Shaw may nod when treading some unfamiliar field such as the laboratory; and also the racecourse, where he blunders badly at the "Tote, in which gamblers deposit the sums they are prepared to stake on the horses they fancy. After the race, all the money staked on the winner is divided among its backers. The machine keeps the rest" (p. 112). Incidentally, it is revealed that Mr. Shaw lacks elementary knowledge of contract bridge when he declares, "Card games are games of chance; for though the players may seem to exercise some skill and judgment in choosing which card to play, practice soon establishes rules by which the stupidest player can learn how to choose correctly: that is, not to choose at all, but obey the rules". For this absurdity, Mr. Shaw deserves perpetual partnership with a stupid player,

Dismissing now the defects, and approaching the constructive aspects, it is the avowed purpose of this book to urge the necessity of government by councils of qualified persons chosen from panels, and subject to the sternest possible public criticism. "Government by ignorant good men may be worse than by cultivated bad ones" (p. 343). "For legislative purposes adult suffrage is out of the question, as only a small percentage of any population has either the requisite faculty or knowledge: but for ventilation of grievances, questioning of ministers and criticism of cabinets, suggestion of remedies and new methods, moving of resolutions and votes of confidence and the reverse, and generally for keeping the government in touch with the people, a representative popular parliament of men and women in equal numbers is necessary." This is commonsense, and could be fitted into Lincolnian democracy.

The plain man, smarting under the lash of this provocative octogenarian and then soothed by his genial smile, will rightly ask whether the philosopher's own remedy, if attainable, will really mitigate the world's pain. Too clear-sighted to accept the tedious popular slogan "equality of opportunity", he does believe in equality of income which, at the moment he places at the comfortable standard of £5,000 a year. Yet he writes (p. 135): "Civilization confers benefits on mankind; but it also imposes activities and efforts of which we are not all equally capable: indeed, of which some of us are not capable at all. Work has to be planned: decisions have to be made: temptations have to be resisted: complicated processes have to be understood. The capacity to meet these demands varies from individual to individual, and also from class to class when there are wide differences of education and income. Those who can find out what to do in organized business are scarce. Those who can find out how to do it are scarcer still. Men who are hopelessly at a loss until they are told what to do and how to do it are very common in any proletarian population. For them the choice is between docility and starvation."

This passage is an admirable synopsis of life's complexity, but is this complexity reconcilable with equality of income? Can these life-problems, in fact, be solved without any material incentive to their solution? Which brings us back to the wise old saying that by the time we are fit for socialism there will be no need for it. Mr. Shaw's powders are pleasantly administered with excellent jam. No thoughtful reader can fail to benefit from submission to this bracing and invectival whirlwind; and in a world of tottering institutions to be thankful for the survival of Mr. Shaw.

M. O. F.

Wolf-Children and Feral Man. By Rev. J. A. L. Singh and Prof. Robert M. Zingg. (Published by Harper Bros. for the University of Denoer), 1944. Pp. 379. Price \$4.00.

More than two centuries back John Locke stated that a child is born with a few unconditioned reflexes and that it develops not only

memory but ideas by the kaleidoscopic way in which sense experience plays upon its initially blank but receptive mind. From an entirely different method of approach Rauber also comes to the conclusion: "We must not forget that the human child learns more during the first two years of its life under the influence of his living surroundings than in all the entire period afterwards. The period of learning the foundations is, therefore, a very short one. The child has even begun to learn the language at this age. If those influences fail let us say until the fourth, sixth or tenth year, how would it be possible that this could be without influence in normal development of the brain?" The inter-relationship between Nature and Nurture has always attracted the attention of scientists, and especially in the case of Man it has given rise to conflicting interpretations. From historical times cases of human isolation have been reported. These fall under three distinct categories; viz., infants reared and suckled by wild animals, children getting lost in forests and surviving by their own efforts and children denied human association by insane or cruel parents. It was Carl Linnaeus, the father of systematic Biology, who, in his tenth edition of *Systema Naturæ*, separated *Homo Sapiens ferus* from man and apes basing his conclusions on instances from history and myth. Nine instances, a few of which are considered of doubtful value by modern authorities, were available to him. These are: the bear-boy of Lithuania, the Hessian wolf-boy, the Irish sheep-boy, the Bamberger cattle-boy, wild Peter of Hanover, the Pyrenees boys, the girl of Cranenburg, the Songi girl from Champagne and Jean of Liege. The German naturalist Blumenbach in his review of the problem of the Feral man dealt with Linnaeus' data "inadequately and unfairly"; owing, as one is led to suspect, to the use to which the concept had been put to by Jean Jacques Rousseau.

The rarity of the occurrence coupled with the fact that by the time the reports see the light of day in print, the real facts get mixed up with extraordinary untruths and contradictions led to a disbelief in their credibility. The finder is rarely the recorder of facts and this resulted in a rejection of the records as those of imposters or of congenital idiots.

Many cases of wolf-children have previously been reported from India, the earliest being that by Sir W. H. Sleeman. Just as to-day foreigners' views on India and Indians are enjoyed with a cynical humour by present-day intelligentsia, previous records of wolf-children reported on Indian testimony were presumed to be unreliable by readers in other parts of the World.

"No scientist would dream of actual experiment with a human subject under such rigorous control as removing all human association and contact. Cases of Feral man and certainly the present one of the wolf-children of Midnapore, offer objective data subject to this control of fundamental importance to theories of human studies." The first part of the book presents evidence of a crucial experiment start-

ed by a mother-wolf and continued by Rev. and Mrs. Singh.

On October 17th, 1920, Rev. Singh captured two wolf-children near the village of Godamuri. It was surmised that the elder was about eight years of age and the younger about a year and a half. They were brought to the Orphanage run by the Reverend and his wife and in the diary are recorded the results of the attempts to humanize these "wolf-girls". Amala, the younger, died a year later, but Kamala lived for nine years after her capture. The diary traces "the terrible strain that Kamala went through for years to drop off her wolf-conditioning to attain the human personality of a three-year-old at the chronological age of seventeen". It took nine years to develop in her the essentials of human personality such as rudimentary use of language, use of clothes, desire for human association and an upright carriage.

Though it is difficult to accept some of the conclusions of Rev. Singh, all the same one has to admire not only his altruism but also his attempt to throw much crucial light on many human problems.

In the second part Prof. Zingg gives a critical survey of all known Feral cases recorded upto now.

The scientific facts which emerge as a result of the above study, if accepted, would act as a cold douche to militant politicians and communalists, for, after all, politics and religion appear to be only a sort of "conditioning" the brain, and hence the outlook.

There is no index.

The book is well got-up and deserves a place in every library.

M. K. SUBRAMANIAM.

Your Food. By M. R. Masani. (Tata Studies in Current Affairs, Tata Sons, Bombay), 1944. Pp. viii + 82. Price Re. 1.

This little eighty-two page, profusely and suggestively illustrated book, is planned to be the first of a series of publications which the illustrious and the munificent House of the Tatas have sponsored "with a view to stimulating interest in some of the most vital problems of India, and by the widespread dissemination of knowledge on such subjects, creating a body of public opinion which may, in time, influence policy and action". The pamphlet deals with "Your Food" which constitutes the fundamental and primary want of man.

In the course of the thirteen chapters which comprise the book, the author has tried to furnish convincing and scientifically accurate answers to some of the most important problems relating to food and food policy. The reader can get himself informed on questions like: Why do we eat? How much to eat? What is there to eat? What is a balanced diet?

The question of our supplies and deficiencies with regard to our food, the impoverishment of our soils and the low yields of crops therefrom, are all dealt with by the author in an original and effective manner, supported by facts and figures. The pathetic fact that decades of chronic starvation under which large masses of our population have suffered has undermined their morale and their sense

of independence, has been brought home to the reader. To quote the author, "Is it any wonder then that the chronic starvation of which our people have been the victims for many generations has sapped their sense of sturdy independence and made it difficult for them to assert their right to free nationhood? As much as our internal divisions, perhaps, it is this undernourishment that keeps us from asserting ourselves and securing for India a free and equal position among the nations of the world".

Too little production of food, too many mouths to feed sums up the situation in our country; more food and better food should be obtained not only from our soils and from our herds but also from the vast expanses and depths of the ocean which encircles this peninsular subcontinent. The fishery resources of the Bay of Bengal, of the Arabian Sea and of the Indian Ocean still remain to be exploited. How to make the most of our slender food resources, is detailed in the twelfth chapter while the last one discusses the relation of the quality of food to income. Who does not like nutritive food and all of us can recognise and appreciate "quality" and choose our foods. This is bound up with economics, "with the fight for the abolition of poverty, which is one of the biggest crusades on which we as a nation should launch".

The book is written in a delightfully popular style; the facts presented are scientifically accurate; the economic data are both useful and illuminating. The author has earned the gratitude of all his readers, for the clear and successful way in which such a large volume of information has been presented with such lucidity and effectiveness. This is a book which should be translated into every one of the Indian languages, thus enabling our masses to get themselves enlightened on the important topic of "Our Food".

Venereal Diseases. By James Marshall. (Macmillan & Co., Ltd.), 1944. Pp. 348. Price 21/-

This elegantly got-up and lucidly written handbook gives precise diagnostic points, and detailed information regarding the available therapeutic measures and does not waste much space on the pathological or academic aspects.

In a country like ours, where medical relief in the rural areas is insufficient, and therefore specialist aid is scarce, the practitioner has to know correct diagnosis and details of therapeutic technique of almost all diseases. To him this handbook is admirably suited and will keep him informed of the latest methods of diagnosis and treatment of venereal diseases.

A later edition, we are sure, will give details of penicillin treatment, when penicillin will be made easily available to all practitioners.

M. S.

Possibilities of Increasing Food Production in Mysore. By Dr. B. Narasimha Iyengar, Retired Director of Agriculture in Mysore. (Reprinted from the *Mysore Information Bulletin*), October 1944.

This little pamphlet represents a thoughtful and highly practical contribution to the problem of increasing the production of food in

Mysore. The author, who is one of our leading authorities on the subject of Indian agriculture, invites attention to the urgent need of an application of the nitrogenous and phosphatic manures to the impoverished soils with a view to increase the acreage yield. The author has shown that there is little need for bringing new land under cultivation. "Even the agency set up by the Government of India for the

'Grow More Food' campaign came to the conclusion that there was a better chance of achieving their object by concentrating their attention on producing more per acre from lands under cultivation than by extending the area."

We commend this article to the earnest attention of all those interested in securing greater returns from our impoverished soils.

SCIENCE NOTES AND NEWS

The Indian Drugs Research Association, Poona, inaugurated early last year, has just issued a short report of its activities for 1944. The study of indigenous drugs offers to the scientific investigator a rich and promising field, and is of vital economic importance to an impoverished country like ours. The system of Indian medicine has already given to the world, a substantial number of potent drugs which are now being extensively employed in the remission of some of the refracting diseases. It has several more treasures, if only our scientists and the Government would organise an intensive study of the time-honoured drugs of lasting repute. The Indian Drugs Research Association represents a praiseworthy organisation intended to advance this object.

Workers experienced in this field have felt that the methods which are now adopted for elucidating problems connected with the study of indigenous drugs have to be replaced by a system of analysis and investigation which is more fruitful and rapid, while the adoption of the present methods may lead to unexpected results of far-reaching value, the immediate objective is often bypassed. A new and fresh approach to the problem is essential; at the moment the orthodox course of investigation is painfully cumbersome, pitifully slow and frightfully extravagant.

One is tempted to speculate upon the methods of investigation which were adopted by the founders of the ancient systems of medicine. If a revival of these methods—now extinct—could be secured through the co-operation of the progressive and enlightened leaders of Hindu and Unani systems of medicine, and a new system of investigation evolved by modifying the methods in the light of modern technique, the Indian Drugs Research Association would have contributed substantially to the study of Indian drugs.

University of Madras: The Ramanujan Memorial Prize, 1945.—"The Ramanujan Memorial Prize" of the value of Rs. 500 will be awarded for the best essay or thesis written on any branch of Mathematics embodying the result of the personal investigations of the author and containing clear evidence of independent and original research. The prize is open to all persons born or domiciled in India. Intending competitors should forward their essays or theses so as to reach the Registrar not later than the 1st December 1945.

Endowment Lectures, 1945-46.—The Syndicate will proceed shortly to select persons to deliver lectures under the following endowments for the year 1945-46. Applications for

lectureships will be received by the undersigned not later than the 1st March 1945. Applicants are requested to give full particulars regarding their qualifications and the subject selected by them for the lectures. The lectures are to be delivered before January 1946. Separate applications should be submitted for each lectureship.

The principal terms and conditions of award are given below:—

(1) *The Maharaja of Travancore Curzon Lectureships*.—Three lectureships of the value of Rs. 250 each relating to Medicine (Clinical), Engineering, and Agriculture. Applicants should be graduates of the University.

(2) *The Sir Subrahmanya Ayyar Lectureship*.—Value Rs. 250. The lectures should be on a subject connected with Ancient Indian History and Archæology. Applicants should be graduates of the University.

(3) *The Sankara Parvathi Lectureship*.—Value Rs. 250. The lectures should be on a subject connected with Ancient South Indian History. Applicants should be graduates of the University.

(4) *The Sir William Meyer Lectureship*.—Value Rs. 1,500. A course of not less than six lectures should be delivered on a subject in Economics. Half of the remuneration will be paid after the delivery of the lectures and the other half after the publication of the lectures.

(5) *The Principal Miller Lectureship*.—Value Rs. 350. A course of not less than two lectures should be delivered on a subject, dealing with the exposition of the Inner Meaning of Human History as disclosing the one increasing purpose that runs through the ages.

(6) *The Dr. Elizabeth Matthai Lectureship*.—Value Rs. 300. A course of not less than three lectures should be delivered on a subject embodying the results of original investigation in some branch of Medicine and Surgery. Preference will be given to a subject having special reference to the requirements of women and children.

(7) *The Sundaram Ayyar-Krishnaswami Ayyar Lectureship*.—Value Rs. 200. The lectures should be on a subject relating to (a) Public International Law, or (b) Inter-State Relations of Indian States and British Indian Provinces, or (c) Comparative Legislation.

(8) *The Diwan Bahadur K. Krishnaswami Rao Lectureship*.—Value Rs. 200. The lectures should be on a subject relating to some aspect of Ancient Indian Cultures studied from original sources.

(9) *The Father P. Carly Lectureship*.—Value Rs. 200. A course of not less than two lectures should be delivered on a subject in