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TAMIL EDITION

A TEXT-BOOK OF ARITHMETIC

FOR LOWER SECONDARY OR MIDDLE SCHOOLS

BY

The late S. RADHAKRISHNA AIYAR, B.A.

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AND

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Prepared on the lines indicated by the syllabus in **Elementary Mathematics** recently prescribed
by the Director of Public Instruction, Madras, for Form I.

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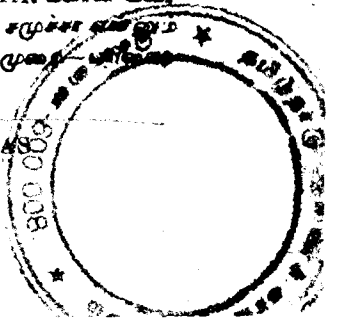
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AND

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(முதல் பாகம்)

பொருளடக்கம்.

I. எண் மாண்பும் எண் குறிப்பும் :—எண்கள் ; இலக்கங்களால் எண்களைக் குறித்தல் ; எண்களின் சுய மதிப்பும் ஸ்தான மதிப்பும் ; ரோமன் வழி. II. கோடுகளும் புள்ளிகளும் நீள அளவையும் :—கீழ்ப் ; ஸர் பெஸ்கள் ; கோடுகள் ; புள்ளிகள் ; கோடுகளின் வகைகளும் கோடுகளைப் பரீட்சிக்கும் விதமும் ; புள்ளிகள் குறித்தலும் கோடுகள் இழுத்தலும் ; நீள அளவு ; டிவீடர்களின் உபயோகம் ; எண்களை நீளத்தால் குறித்தல். III. கூட்டல் :—கூட்டலின் அர்த்தமும் உபயோகமும் ; கூட்டலைப்பற்றிய ஓர் உண்மை ; கூட்டலைப் படத் தால் காண்பித்தல் ; அடைப்புக் குறிகள் ; கூட்டல் ; பெரிய கணக்குகள் ; கழித்தல் ; கழித்தலைப் படத்தால் காட்டுதல் ; பலவகை கழித்தல் வழிகள் ; கூட்டல் கழித்தலைப்பற்றின சில விதிகள் ; கலப்புக் கூட்டலும் கழித் தலும். IV. பெருக்கல் :—பெருக்கலைப் படத்தால் காண்பித்தல் ; ஒரு ஸ்தான எண்ணால் பெருக்கல் ; பாக்டர் களால் பெருக்கல் ; எந்த எண்களைக் கொண்டும் பெருக்கல் ; பெருக்கலில் குறுக்கு வழிகள். V. வகுத்தல் :— வகுத்தலைப் படத்தில் காட்டுதல் ; ஒரு ஸ்தானத்தால் வகுத்தல் ; பாக்டர்களால் வகுத்தல் ; 10, 100 முதலிய லவகளால் வகுத்தல் ; நீள வகுத்தல் ; வகுத்தலின் இன்னொரு அர்த்தம் ; சில பெருக்கல் வகுத்தல் விதிகள் பெருக்கல் வகுத்தலில் சில குறுக்கு வழிகள் ; ஒன்பதுகளை நீக்குதல். VI. பலவின் வெண்கள் :—அளவை வாய்ப்பாடுகள் : நாணய அளவுகள் ; நிறை அளவுகள் ; நீள அளவு ; பிடித்தல் அளவு ; கால அளவு ; காசு அளவு ; எண்ணிக்கை அளவு ; இனமாற்றுதல் ; பலவின் வெண் கூட்டல் ; கழித்தல் ; பலவின் வெண் பெருக்கல் ; பலவின் வெண் வகுத்தல். VII. கோணங்களும் அவற்றின் அளவும் :—திசை, திசைமாற்றம் ; கோணம், கோணங்களை ஒப்பிட்டுப் பார்த்தல் ; கோணங்கள் ; சதுரங்களும் ரெக்டாங்கிள்களும் ; வட்டங்கள் ; கோணங்களின் அளவு ; கோணங்களின் வகைகள் ; ப்ரொட்டாக்டரைக் கொண்டு கோணங்களை வரைதல் ; ஒரு புள்ளியிடத்தில் உள்ள கோணங்கள். VIII. டெஸிமல்கள் :—டெஸிமல்களின் அர்த்தம் ; டெஸிமல் குறிப் பில் ஸ்தான மதிப்பு ; இரண்டாவது டெஸிமல் ஸ்தானம் ; டெஸிமல் குறிப்பு பொது விவரம் ; ஒரு டெஸிமல் ஸ்தானமுள்ள எண்கள் ; டெஸிமல் கூட்டல் ; டெஸிமல் கழித்தல் ; எந்த எண்களையும் கழித்தல் ; 10, 100 முதலியவைகளால் பெருக்கல் ; ஒரு ஸ்தானமுள்ள முழு எண்ணால் பெருக்கல் ; ஒரு ஸ்தானமுள்ள முழு எண் ணால் வகுத்தல் ; பல ஸ்தான முழு எண்களால் பெருக்கல் ; பல ஸ்தான முழு எண்களால் வகுத்தல். IX. உயர்ந்த பொது அளவும் தாழ்ந்த பொது மடங்கும் :—அளவும் மடங்கும் ; பொது அளவும் மடங்கும் ; உயர்ந்த பொது அளவும் தாழ்ந்த பொது மடங்கும் ; பாக்டர்களால் இரண்டு அல்லது இரண்டிற்கு மேற்பட்ட எண்களின் உ. பொ. அ. உம், தா. பொ. ம. உம் கண்டுபிடிக்கும் வழி ; உ. பொ. அளவைக் கண்டுபிடிக்கும் பொது வழியைப் படத்தாற காட்டல் ; உ. பொ. அ. பொது வழி. X. சாதாரண பின்னங்கள் :—பலவின அளவுகளின் பின்னங்கள் ; ஒரு கான்கீர்ட் அளவை இன்னொரு கான்கீர்ட் அளவின் பின்னமாகச் சொல்லுதல் ; சமமான பின்னங்கள் ; சமமான பின்னங்களைப் படத்தாற காட்டுதல் ; பின்னங்களின் சமத்துவம் ; தாழ்ந்த

உறப்புகள் ; பின்னங்களை ஒப்பிடுதல் ; பின்னங்களின் கூட்டலும் கழித்தலும் ; ஒரு சாதாரண பின்னத்தை ஒரு முழு எண்ணால் பெருக்கல் ; சாதாரண பின்னத்தை ஒரு முழு எண்ணால் வகுத்தல் ; ஒரு பின்னத்தால் பெருக்கல் ; பின்னத்தின் பின்னம் ; ஒரு பின்னத்தால் வகுத்தல் ; ஒரு எண்ணை ஒரு குறிப்பிட்ட டி.எம்.என். பர் உள்படி மாற்றல் ; பின்னங்களைச் சுருக்கல். IX. வாடிக்கை முறை.—பலமாதிரிக் கணக்குகள். பரீட்சைக் கேள்விகள். விடைகள்.

முதல் பாகம் 5-வது வகுப்புக்கும் 1-வது பாரத்திற்கும், கிரௌன் 300 பக்கங்கள், விலை அணு 12.

Approved as a Text-Book suitable for School use,

vide Fort St. George Gazette, Part I-B, p. 546, dated 1-11-27.

(இரண்டாம் பாகம்)

பொருளடக்கம்.

பரீட்சைக் கேள்விகள். I. டெஸிமல்களின் பெருக்கலும் வகுத்தலும் :—ஒரு ஸ்தான டெஸிமல் எண்ணால் பெருக்கல் ; சமமான பரிசோதனை ; எந்த டெஸிமல் எண்ணாலும் பெருக்கல் ; டெஸிமல்களால் வகுத்தல் ; சமாராய்ச் சொல்லல் ; சாதாரண பின்னங்களை டெஸிமல்களாக மாற்றல் ; டெஸிமல்களை சாதாரண பின்னங்களாக மாற்றல். II. சராசரி, டிவிடியோ முதலானவை : சராசரி ; ரேஷியோ ; மாறாத ரேஷியோ ; ரேஷியோவின் உபயோகங்கள் ; ப்ரோபோஷன் ; லாப நஷ்டம் ; வருமான வரி ; கடன் மிகுதல். III. பாய் பளவு : பாய்பளவு ; ரெக்டாங்கிள் ; இங்கிலிஷ் பாய்பளவுகளும் ப்ரெஞ்சு பாய்பளவுகளும் ; பாய்பளவு வாய்ப் பளவும் ; பிளான் வரைதல், அதாவது அமைப்புருவம் வரைதல் ; தரையின் பாய்பளவும் நாற்சுவர்களின் பாய் பளவும் ; கட்டக் காகிதத்தின் உபயோகம். IV. பொது எண் கணக்கு—சமீகோணங்கள் : அங்க கணிதமும் பீஜ கணிதமும் ; சில பெயர் வினக்கங்கள் ; சமீகோணங்கள் ; இன அங்கங்கள் ; அடைப்புக் குறிகள் கீக்குதல். V. முக்கோணங்கள் : அவற்றின் பக்கங்களும் கோணங்களும் : முக்கோண விரிப்பு ; முக்கோணங்களின் கோணங்கள் பக்கங்களுக்குள்ள சம்பந்தங்கள் ; ஒரு புள்ளியிலிருந்து சிபந்தனைக்கிணங்க மற்றொரு புள்ளி குறித் தல் ; இரண்டு புள்ளிகளிலிருந்து சிபந்தனைக்குக் கிணங்க மற்றொரு புள்ளி குறித்தல் ; கொடுக்கப்பட்ட அளவு களைக் கொண்டு முக்கோணம் வரைதல் ; வட்டங்களின் சில தன்மைகள் ; முக்கோணங்களின் வகைகள் ; ஓர் புள்ளியிலிருந்து ஓர் கோட்டிற்கு பெர்பெண்டிகுலார். VI. கோடுகளையும் கோணங்களையும் இருசமபாகங் களாக்கல் : இருசம பக்க முக்கோணங்களின் சில தன்மைகள் ; கோடுகளை இருசம பாகங்களாக்குதல் ; கோணங்களை இருசம பாகங்களாக்குதல் ; கார்ட்டளையும் வட்ட பாகங்களையும் இரண்டு சம பாகங்களாக்குதல் ; பெர்பெண்டிகுலார்கள் இழுத்தல் ; ஸிம்மெட்ரி. பலமாதிரிக் கணக்குகள் ; முதல் பாரப் பாடங்களில் புதிய கணக்குகள் :—கூட்டல் கழித்தல் ; பெருக்கல் ; வகுத்தல் ; பலவின எண்கள் ; கோணங்களும் வட்டங்களும் ; டெஸிமல்கள் ; உயர்ந்தபொது அளவும் ; தாழ்ந்த பொது மடங்கும் ; சாதாரண பின்னங்கள் ; பலமாதிரி. இரண்டாம் பாரப்பாடங்களில் பலமாதிரிக் கணக்குகள். பரீட்சைக் கேள்விகள் அறுபத்தாம். விடைகள்.

இரண்டாம் பாகம் 2-வது பாரத்திற்கு, கிரௌன் 208 பக்கங்கள். விலை அணு 10.

Approved as a Text-Book suitable for School use

vide Fort St. George Gazette, Part I-B, p. 513, dated 13-11-1928.

(மூன்றாம் பாகம்)

பொருளடக்கம்.

பரீட்சைக் கேள்விகள் ; அத்தியாயம் I. நூற்றுக்குக் கணக்கிடலும் அதன் பிரயோகங் களும் ; II. ருண எண்களும் பீஜ சமீக்கைச் சேர்க்கைகளும் ; III. சமாந்தரக் கோடுகளும் அவற்றின் தன்மைகளும் ; IV. படக் குறிப்புகள் ; V. ப்ரோபோஷன்—நோனதும் மாறான தும் ; VI. முக்கோணங்களின் சர்வ சமத்துவம் ; VII. முக்கோணங்கள், சமாந்தர நாற்பக் கங்கள், வட்டங்கள் இவற்றின் பரப்புகள் ; VIII. பருமன் அல்லது கன அளவு ; IX. தனிச் சமீகோணங்களும் அவற்றிற்குக் கொண்டுவீடும் யோசனைக் கணக்குகளும் ; X. பலவகைக் கணக்குகள் ; பரீட்சைக் கேள்விகள் ; பலமாதிரிக் கணக்குகள் ; விடைகள் ; பலவின அளவு வாய்ப்பாடுகள். Cr. 8vo. 300 pages. விலை அணு 12.

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SHRIMATI NATHIBAI
DAMODAR THACKERSEY
INDIAN WOMEN'S UNIVERSITY:
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I THANK the Chancellor and his colleagues on the Syndicate for having given me the privilege of addressing this Convocation of the Fellows and graduates of the Shrimati Nathibai Damodar Thackersey Indian Women's University. I thank also those friends of women's education in India who have assembled in this Hall and will be pleased to give me a patient hearing.

As I stand before you to-day, ladies and gentlemen, I recall with pleasure the thrill with which I read nearly fifteen years ago Prof. Karve's announcement of his intention to found a University for Indian Women. The thrill was a feeling of joy not unmixed with

* By Principal A. B. Dhruva, M.A., LL.B., J.E.S. (Retired), Pro-Vice-Chancellor, Benares Hindu University

surprise at the idea of starting a Women's University when not even all the principal towns of the Presidency were equipped with a High School for girls. The origin of this extraordinary idea is attributed to a pamphlet describing the Women's University in Japan which was sent by an unknown friend to Prof. Karve shortly before he presided at the National Social Conference in Bombay in December 1915. It would not be surprising if the example of Japan, whose history of the last sixty years is a veritable school-room for modern India, especially in the fields of Education and Industries, impressed Professor Karve very deeply. But it would be hardly fair to his intelligence and character to assume that a casual letter was the cause of his illumination. The cause as distinguished from the occasion of the great announcement must be sought elsewhere. Having been an earnest and practical reformer for many years, he realised the difficulties which stand in the

way of social reform and female education in India. The hesitation of orthodoxy to give a warm welcome to the new type of female education he did not superciliously set aside as mere prejudice, but respected it as a conscientious objection on the part of a certain section—and that a large section—of his country-men. He saw that if female education is to be made popular and thus a living force in Indian Society, it must be adapted to the needs of Indian life. For this, two things, he thought, were necessary. The time required for completing girls' education should be economised, and secondly, the character of their education should be brought into harmony with the Indian idea of womanhood. The cry against the new education was not a peculiarity of Indian conservatism. In Japan the first fruits of female education were considered disappointing because the girls who were brought up on American lines were discontented when they returned home to the 'three obediences.' Consequently a reaction set in, and eventually the education had to be adapted to the national demand for the particular type which was suitable for Japanese girls. A similar state of things Prof. Karve perceived in India. Next, howsoever much it might be considered desirable to postpone the age of marriage to enable girls to complete their education, it was imperatively necessary that a complete course of secondary and higher education should be devised which could be imparted before their marriageable age was long past. This could be secured, first, by eliminating certain subjects from the boys' courses which were imposed upon girls, and, secondly, by introducing a great educational reform which was overdue even in the boys' colleges, *viz.*, instruction through the mother-tongue.

Here are the two special features of this University, which have a value apart from the special circumstances in which they would seem to have forced themselves upon Prof. Karve's attention.

Of these the second, though by no means essential to the scheme of Prof. Karve's Indian Women's University, is yet important since it is an experiment which no other University in India except Osmania has carried out whole-heartedly. Theoretically, as an abstract principle of education, it is admitted on all hands that the mother-tongue of the pupil is the only natural medium of instruction. But objection is taken to its adoption in the special circumstances of India on practical grounds. It is contended that India wants a common national language, and English is the only language which can be made national; secondly, it is said that English is a world-language and therefore essential for international correspondence; thirdly, its removal from the place of the medium of instruction is said to be responsible for weak English wherever the new experiment is tried; and fourthly, it is argued that the Indian vernaculars are yet very poor, and there are no good text-books in the vernaculars which could be used for the different subjects which are taught in colleges.

Before we proceed to consider these objections, let it be frankly declared that no objection except the last has any value when placed beside the problem of the day, which is—How to make education *real*? We are entering upon an age in which an ounce of real knowledge will weigh more than a ton of felicitous expressions in a foreign language. Still, let us consider the objections which have been urged in favour of making English the

medium of instruction. It is difficult to contemplate with equanimity the first suggestion, that of making English a national language. To my ears, I confess, 'English a national language for India' involves an inherent contradiction. For Hindustan the only language that can be national is Hindustani, as English is of the English and German of the Germans. Hindustani is the national language already of more than half the country, and wherever it is not it has the first right to be made one. But we are not concerned here with the wider aspect of this problem. *We want a large number of Universities in India of diverse types and founded on a linguistic basis*, which will correspond and co-operate with one another just in the way the English and continental Universities do at present. At the same time we fully recognize the importance of English as a great world language and consequently make it a part of our compulsory course, thus meeting the first two objections. The third objection deserves to be considered more seriously. If the students' English becomes weak as a result of its disuse as a medium of instruction, we must trust to other methods of improving it. The use of a language as the medium of conversation is a very good way of teaching it and the method may well be adopted in the period reserved for English. But there is no justification for extending its use to other subjects, which have their own right to being taught well, and this can be done only through the medium of the mother-tongue. The true remedy for this evil, if it really exists, lies in providing better teachers in English as well as in other subjects. Moreover, it should be remembered that India cares for English literature because it is a mine of great and noble thoughts, and one need not confound

good English with mere fluency in speaking conversational English such as is spoken in Anglo-Indian homes. The last objection based on the want of text-books in the vernacular moves in a vicious circle. Text-books in the vernacular are wanting, precisely because the medium of instruction is not the vernacular. Besides, education through text-books is, as every educationalist admits, a wrong method. All subjects, except literature, are best taught through syllabuses and not through text-books. The lectures of Professors should make text-books, and not text-books their lectures. The latter method which has been long in vogue in India is responsible for the lack of originality which vitiates much of the work done in Indian Colleges.

Let us now pass on to the second feature. We are asked by some of the best friends of female education in India—Why should there be a separate University for women with distinctive courses? My simple answer is: Because men have ignored women too long, unpardonably long, making no provision for their special needs in the educational system of the country. The type of education which we have learnt to associate with the name of Macaulay but which we owe no less to the patriotism and far-sightedness of Raja Ram Mohan Roy has been in the land for a full hundred years, and even if we confine our attention to higher education, the major Universities in India have been at work for no less than seventy years. During this long period the new education is fully justified of its children. It has awakened the country, it has knit together its varied populations, it has in one word, done much to modernize India. Yet in the direction of women's education it has done precious little,

Neither the educational departments of the different provinces have devised and pushed forward any large scheme for the expansion of female education, nor have the Universities pressed the necessity of establishing colleges for women upon the attention of the Government. It will be said that there are colleges for boys where girls can also go and the resulting co-education is desirable for putting an end to the barrier which is at present placed between man and woman in India. I recognize the advantage of co-education, for I am no believer in cloistered virtue. But in my humble judgment the advantage does not compensate for the loss which arises from the absence of separate colleges for women. The advantage can be easily secured by creating opportunities for frequent meeting at inter-collegiate lectures, debates, games, and entertainments. But the stimulus to female education which is greatly needed at present can only come from the establishment of special colleges for women. While recognizing fully that women are human beings quite as much as—can't I say more than?—men, let us not forget that they are human beings who are *women*, and consequently their education should be *partly* different from that provided for men. It is wrong to think that special curricula for women mean or should mean 'soft' subjects. The differentiation of curricula is based on the different needs of the two sexes,—or let us say, two natural groups of human beings—constituting the nation. One group has to look after the State, the army and the markets, the other after the home, the nursery, and all those comforts, material and spiritual, which make human life sweet. An individual of one group may be quite as competent as an individual of the other group

for discharging the duties of the latter; and, therefore, there should be no absolute bar laid between the two. But it is waste of national and human energy to duplicate workers in one field while the other suffers for want of them. Let us try to visualize how much better would be our homes if women were educated to make them special objects of study instead of trying to beat men in their field. An occasional reminder of equality of this kind between man and woman may not be bad for them, but the main business of women and men should be to help each other. Co-operation and not competition is the maxim of new sociology.

There is one criticism to which this University, as it is at present constituted, seems open. Considering the wide area for which it has to cater, it cannot become wholly residential. The advantages of a residential University are no doubt many, for a common residence of all the members of a University creates a better and more frequent co-operation of Professors and students, of Professors and Professors, and of students and students. But the establishment of a large number of residential Universities in a vast and poor country like India is not a business proposition, and consequently we must at present remain satisfied with what is next best to it. We should establish a large number of good High Schools and Colleges in different parts of the country which may be non-residential in the beginning, but which may be made residential as soon as practicable. But it should be noted that in estimating the value of federal Universities, the character of constituent schools and colleges is often overlooked. These if made residential are themselves excellent centres of educational life, which by their compactness make for better *esprit de corps*

than even huge Universities where it is difficult to create a unity of spirit between an Engineering College and a College of Theology or Medicine. I agree that a local University which really teaches is better than a National University which merely examines. But it is a mistake to think that a University exists only at the Head-quarters or in the Registrar's Office. Constituent colleges spread over different parts of the country are the living limbs of a University and a University exists in them just as well as they do in a group of colleges situated within the limits of a few acres, *provided*—and the proviso is very important—the constituent colleges have common ideals and common ways of life. In view of the fundamental unity of Hindu civilization, it may not be undesirable to affiliate the Colleges of Gujarat and Maharashtra to a single University, but considering that their differences are quite as important as their points of similarity it may be advisable to have a separate University for Gujarat in the near or distant future when sufficient funds are available. This is, in my view, a consummation to be immediately wished for. But until it is reached there is no reason why the two provinces should not continue to co-operate heartily as they do at present.

Before I conclude I should like to address a few words specially to the lady-graduates of this University.

My young friends, I congratulate you most heartily on your achievement. As a student of ancient Indian culture, I assure you that in taking your education you have fulfilled the tradition recorded by Old Manu who said: "पुराकल्पे तु नारीणां मौजीबन्धनमिष्यते"—i. e., "In times of yore women were invested with the sacred thread" which marked their admission

to the life of students. Harita* speaks of two classes of girls—"ब्रह्मवादिनी" and "सद्योवधू." i. e., those who dedicate themselves to study and those who immediately marry. The word 'सद्यः'—'immediately'—in this context is significant. Between the two extremes it implies one more class of girls who did not marry 'immediately' after initiation, but spent intermediate years in education as they were originally expected to do before the pressure of the Iron Age altered the old custom and the Upavita Samskara became a sham. It is for you to revive this sacred tradition by your example and precept, and above all, by the life and conduct which is demanded of a graduate of this University.

The work that lies before you is immense. You have to bring up the children who will be the makers of India of the next generation not by playing the role of lookers-on but by introducing better methods of child-rearing. You have to make Indian homes more sanitary, more beautiful and more peaceful. There is a great amount of welfare work which you women alone can do. Our innumerable unfortunate sisters ground down by poverty, ignorance and unjust social customs will confide their cares and troubles to you alone. The sick in the hospitals are groaning for relief at your healing hands. At present for want of lady teachers elementary education is suffering, which in the natural course of things should be in your hands. And if the education of the child is to be really efficient it should be individual and not collective as at present, and this reform can

* "द्विविधा स्त्रियो ब्रह्मवादिन्यः सद्योवध्वश्च । तत्र ब्रह्मवादिनीनामुपनयनमग्नीन्धनं वेदाध्ययनं स्वयमेव च भिक्षाचर्येति । सद्योवधूनां तु उपस्थिते विवाहे कथंचिदुपनयनमार्त्तं कृत्वा विवाहः कार्यः "

be carried out by placing it largely in the home. If some of you have a bent for research, here is your special field, *viz.*, child-psychology in which at present we men do little more than read books written by men, and these again based on observation of the child-mind and the child-behaviour of Europe and America. Then, again, you have Indian music, with its northern and southern schools, folk songs and aboriginal music, which you can study scientifically and historically, and compare them with European music and finally develop Indian music on original or syncretic lines. The same thing *mutatis mutandis* for painting. Next, is chemistry of cookery taught in the Royal College of Science? I believe it stops with the study of vitamins. If so, is there not sufficient work for you in the shape of developing the art of cookery for the benefit of the sick, the convalescent and the epicure? Why should your brothers feel attracted to Italian confectionery if you can supply better and more wholesome dishes after a careful scientific and artistic study of Bengali, Madras, Maharashtri, Gujarati and Hindustani cookery? Do not imagine that this work is *infra dig* for you, or that we men want you to confine yourselves to this and similar work. Indian women have distinguished themselves in the past in various walks of life, as poets, philosophers, scientists, religious teachers and administrators. The Mahabharata, which abounds in stories of different chronological strata, and holds the mirror faithfully to ancient Indian life, records dialogues which do much credit to the intelligence, culture and common sense of women, and it is your right to walk in their foot-steps. Modern India is showing signs of a great national upheaval in science, letters, politics, and social and religious life in which women have begun to

take their proper share—which is the happiest augury of the success of the silent revolution which is already upon us. At the same time you will permit me to say that marriage and its consequential responsibilities make up your highest avocation. As my friend—Babu Bhagavandas—observed on one occasion, “the vast majority of women are intended by nature, and at heart prefer to be, not unmarried Misses Sarasvati, but Grihalakshmis and Annapūrnās, goddesses of the family home, whose very presence and companionship bring joy and strength into the life of their partners, and make it possible, and worth while, for them to follow their special vocations successfully.” “Motherhood,” it is rightly said, “is the noblest of priest-hoods.”

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JOHN DALTON, THE PHILOSOPHER (1766—1844)

By

Mr. P. A. NARAYANA AIYAR, M.A., L.T.,
Lecturer in Chemistry, Govt. College, Kumbakonam.

NO student of Chemistry could escape remembering John Dalton almost every moment. After all, he was not an experimental chemist. He has no new analytical method, no great discovery of any recognition to his credit but his work was of a different order. It is as a law-giver that he ranks among the greatest of scientists and possesses particular claims to remembrance. In his atomic hypothesis, he laid the foundation-stone upon which the mighty superstructure of modern chemistry has been reared. The life of the founder of modern chemistry cannot but interest even the layman in the street as he made search after truth the business of his life.

John Dalton was born in Cumberland on the 6th September 1766. His father, Joseph Dalton, was a weaver of cheap woollen goods for country use. His trade was a common one in those days, for the north county people wore but little cloth that was not woven at home or linen not homespun. His mother Deborah was an active, energetic woman, quite different from the easy-going Joseph with whom she threw in her lot. He had one brother Jonathan and a sister Mary. There was nothing remarkable in the early childhood of John Dalton as he, being a child of the simple

Quaker people, was very shy and awkward. He helped his father in his trade by preparing the shuttles and holding the spools, being now and then ushered into the

mysteries of mathematics by his father. He also attended a village school directed by Mr. Fletcher, “a man of considerable ability and foresight, who taught on more rational lines than was usual at that time such useful subjects as mensuration, surveying, navigation, etc.” His early education was however very distracted as he in common with his fellows was compelled to assist on his father’s farm in the summer and could pursue his studies during the long winter evenings only.

At the age of twelve, his school education practically ended, he being employed as a school-master in his native village. He is referred to have struggled hard to maintain discipline in this school, for many of the learners were as old as he and frequently challenged him to fight in the graveyard outside. He was compelled to give up the school

in 1781 and took up an assistant’s place in Kendall where his brother Jonathan was employed.

The Dalton brothers were not popular as teachers on account of their sternness in matters of discipline. On one occasion, when corporal punishment was administered, John held the culprit while Jonathan used the whip so sharply that blood was drawn and the assistance of a surgeon was rendered necessary.

In spite of their uncouth manners, John Dalton was the more popular of the two. He was occupied often with mathematical problems and was assisted by one John Gough, a man blind from infancy but of considerable scientific attainments and orderly habits of mind. Dalton refers in several of his works to his indebtedness to Gough whom he held in very high estimation. ‘He and I have been

for a long time very intimate. As our pursuits are common—*viz.*, mathematical and philosophical—we find it very agreeable to communicate our sentiments and converse on those topics.' Apparently it was Gough's example that led him to make and record his scientific observations upon the weather. This was begun in March 1787 and continued till the day before his death. They included reading of the thermometer, the barometer, and the hygroscope—all instruments of 'my own construction.' As school-masters in Kendall, the income of the brothers was limited as this is referred to in one of Dalton's letters to his cousin. "I have but one objection to my present business and it is a material one. That is, the emoluments are insufficient to support a small family with decency." But they seem to have augmented it by performing various duties to the simple village folk including searching registers, making wills, drawing conditions and even collecting rents.

The indefatigable John Dalton also seems to have sufficiently progressed by this time that he announced a course of twelve lectures on Natural Philosophy, the subscription to the whole course being half a guinea or one shilling per lecture if taken singly. As usual in villages this course did not seem to be well-attended as he repeated them a few years later at half the rate. He also added to his income by contributions to the 'Gentleman's Diary' in the form of answers to questions on various topics. It may seem strange that he should condescend to speak with authority on any topic but such work gave him chances of exercising the faculty of grappling with problems—a faculty which later developed into a marvellous power of logical reasoning.

In 1793, he published his observations on the weather under the title of 'Meteorologi-

cal Observations and Essays.' The book opens with an entry concerning the 'aurora borealis' which he describes as follows:—'The intensity of the light, the prodigious number and volatility of the beams, the grand admixture of all the prismatic colours in their utmost splendour variegating the glowing canopy with the most luxuriant and enchanting scenery affording an awful but the most pleasing spectacle in nature, though lasting only about a minute.' His views embodying the causes influencing the rise and fall of the barometer are contained in an essay entitled "On the Variation of the Barometer." The essay on 'Evaporation' contains the nucleus of the idea now known as Dalton's law of partial pressure and a method for determining the dew-point. Entirely self-taught, living far away from books or scientific men, it is a matter to excite wonder and admiration that such comparatively accurate work was done under such disadvantageous conditions. Even thus early in his scientific career, Dalton's work seems to give evidence of his striking powers of observation and logical reasoning.

Just now owing to the good services of his friend Gough, he obtained the post of teacher of mathematics in the New College of Manchester. He now had chances of acquiring knowledge. He had an extensive acquaintance, a certain amount of leisure, a well-stocked library and the means for prosecuting his researches. Here he wrote his book on English Grammar which was not apparently a great success. In 1797, accompanied by a Quaker friend, he started upon a tour through England and the letters written to his cousin indicate his strong affection for his own country and people. He spent happily six years of his life at Manchester—years

which doubtless helped in no small measure towards those habits of observation and inference which served to make him one of the most noteworthy of English philosophers. It was only subsequent to this period that his real scientific work or to be more correct, the work by which he is best known to men of science of to-day, began.

In 1794, he was elected a member of the Literary and Philosophical Society of Manchester of which he became later the President. He contributed to it many memoirs on various subjects and the first paper was on colour vision. Dalton was colour blind and colours appeared different to him from what they do to others. On one occasion, he gave his mother as a birth-day present a pair of silk stockings of what he thought to be a brilliant scarlet hue—a colour of 'an eminently respectable go-to-meeting shade.' She acknowledged the gift by saying "Thou hast bought me a pair of grand hose, John, but what made thee fancy a bright colour? Why, I can never show myself at meeting in them." As soon as he was aware of this defect in his vision, he started in characteristic fashion to collect information on the subject and published his first memoir. The subject was recognised to be of such vast importance that later Young, Helmholtz and Hering were stimulated to undertake research in this field.

It was not until 1795 that his attention was directed towards chemistry. This change may be attributed partly to his having attended Dr. Garner's lectures, for he appears to have been attracted and impressed by the demonstrations. Although the physicist of to-day can hardly refrain from smiling at the experimental

methods adopted by Dalton, yet they mark a distinct advance in scientific knowledge and prepare the ground for Dalton to frame the hypothesis by which his name is to be perennially associated. He writes: "The greatest difficulty attending the mechanical hypothesis arises from different gases obeying different laws. Why does water not admit its bulk of every kind of gas?.....The circumstance depends upon the weight and number of the ultimate particles of the several gases. An inquiry into the relative weight of the ultimate particles of bodies is a subject worth studying; I have lately been prosecuting this inquiry with remarkable success."

Dalton was not the author of atomic conception. Ever since man took the first step from the unreasoning to the reasoning state, he has concerned himself about the constitution of matter, although we find a clear account of the atomic view in the early Greek writings of Empedocles, Democritus and Lucretius. The discontinuous theory of matter has attracted the attention of all subsequent scientists including Geber the alchemist, Robert Boyle the physicist, and Richter the chemist. Though they "had seen the right road, they dared not go farther." To Dalton is due the credit of having enunciated the atomic theory as it is known to-day to explain the laws found to govern the formation of compounds. He showed by experiment that atoms which are the smallest particles of which matter was composed do combine together according to definite rules of number. He also made his point clear by representing the elements with 'characters' and putting them together to indicate combinations. For example, hydrogen was shown O, oxygen © and water composed of these two O©. He

considered the determination of the relative weights of atoms as a matter of the greatest importance and for this purpose he fixed unity as the atomic weight of hydrogen and deduced from various experimental facts of others, the atomic weights of all elements.

Dalton's atomic theory did not at first meet with much approval from recognised quarters. Sir Humphry Davy hesitated for long and wrote:—"I shall be sorry if you introduce an hypothesis which cannot last concerning the alkali metals. It is impossible not to admire the ingenuity and talent with which Mr. Dalton has arranged, combined, weighed, measured, and figured his atoms, but it is not on any speculations upon the ultimate particles of matter that the true theory of definite proportions must ultimately rest."

Dalton's hypothesis was tested and confirmed by Guy Lussac's law of combining volumes and his cumbrous mode of symbolic representation was much simplified by the Berzelius system of nomenclature at present in use, although Dalton would not approve of either in the beginning. He wrote of the latter as 'horrificing and chaotic, calculated to perplex the adepts of science, to discourage the learner, as well as to cloud the beauty and simplicity of the atomic theory' and of the former as 'untenable and mysterious like the mystical ratios of Kepler,' which Newton so happily elucidated.

In spite of oppositions, Dalton's theory has so far stood the test of time. It has marvelously fulfilled the duties of an hypothesis in suggesting new fields for work and new incentives to persevere in attempting to make clear the laws which govern matter. The rule of Avogadro and the work of Cannizzaro followed as necessary consequences of his theory. By it, Dalton became a claimant to the title given him by Dr. Henry: a Law-giver of Chemical Science.

In later life, Dalton continued his scientific researches on subjects of varied interest and published many papers dealing with chemical, physical, meteorological and physiological subjects but they showed a distinct deterioration in quality. In 1803, he was invited to deliver a course of lectures at the Royal Institution. Dalton did not however make a successful lecturer as he possessed few of those graces which attracted a multitude. In the words of Dr. Davy, 'his aspect and manner were repulsive; his voice was harsh and brawling; his gait stiff and awkward; his style dry and almost crabbed.' Still they were very much appreciated by the scientific part of his audience.

Dalton was in no respect a man of the world. Throughout his life, he remained the simple unaffected Quaker wanting in academic virtues; almost entirely unacquainted with those polished touches of refinement so essential to social success. He is certainly no respecter of persons as was evidenced on the occasion of the visit of a distinguished Frenchman who was told 'Will you sit down till I put this lad right about his arithmetic?' Towards women, however, he showed 'those little delicate attentions which are particularly acceptable to them.' He was neither a voracious reader. He even discouraged in others the use of books saying 'I could carry all the books I have ever read on my back.'

Though apparently discourteous in manners, he was not unkindly. If the cause seemed worthy, Dalton gave generously according to his means. He contributed liberally to the funds of the Society of Friends. In later life, his income was added by the death of his brother Jonathan in 1834 and by the contribution of a State pension in 1833 but he did not live long to enjoy them. He was attacked by paralysis in 1837 and suffering from several recurrences of the same disease, he succumbed to it on the 27th July 1844, 'passing away without a struggle or a groan and imperceptibly as an infant sinks into sleep.' He died as he had lived, quietly and simply, without any of the pomp and show which sometimes attend the departure of the great. But he died full of honours which came to him by right without his seeking.

THE PROBLEM METHOD IN PHYSICS TEACHING

By

P. A. SANKARANARAYANA IYER, M.A., L.T.

Senior Lecturer, Training College, Trivandrum.

IT is an admitted fact that class-room demonstrations and pupils' practical work, devised merely to aid in the better memorising of subject matter or to afford formal training in laboratory technique, are not very effective in developing the power of independent thinking or the love for investigation on the part of the pupils. The scientific method is essentially a method of solving problems that present either a utilitarian or intellectual appeal. The present day text-books and manuals of Physics are found to have little or no charm for our pupils, because they are mostly didactic in their plan and written by foreigners, in a foreign language, for foreign requirements and pupils whose very environment is a hundred-fold more scientific in its setting and affords plenty of opportunities to be impressed first-hand with the triumphs and wonders of modern science as a mere matter of course. In points of scientific and industrial advance, India is not less than half a century behind England. It has been said that concepts without precepts are empty and precepts without concepts are blind. Our bachelors and masters of arts in science are themselves labouring under such a disadvantage, when they try to read some of the most popular scientific literature relating to aeroplanes and sea-planes, torpedoes and submarines, radios and wireless or atoms and electrons. It is no wonder therefore, if topics and situations which are fully problematic and exciting to pupils in English public schools, fail to make any appeal whatsoever to the psychological instincts in our children here, when attempted

without the necessary adaptation and careful adjustment to their environment of which we alone are the best judges. Hence science teaching in our schools can be made more meaningful and worth while to the pupils only by the disinterested work of a number of expert science teachers who know the boys and their difficulties full well. They must devise thoroughly familiar and suitable problematic approaches to every topic or principle to be taught, and lead the pupils to follow them up with a significant experiment or two purely for their resultant satisfaction. Mere experiment is of no use unless it sets up thinking on the part of the pupils from start to finish. Thinking must begin and end in the domain of *concrete* observations to be scientific and rational thinking, and we must remember what things are concrete to our boys even without their seeing them and what things, (say a camera or a spectroscope) are never concrete at all at an early age, in spite of these being placed in their hands and explained to them over and over again. This is really what makes all the difference between good and bad teaching. It is time our courses are no longer exposed to the reproach "We do not deal *enough* with real situations or the daily life of the pupils. The specific gravity of liquids they know, but not to say if water is in the milk. The student enrolls in the Physics class because he is interested in the innumerable applications of Science in every day life. In place of cultivating this interest—a most precious possession—we ask him to measure to the second decimal place the diameter of a "cylinder." It is a mistake to think that an experiment or even two, closes a particular topic or principle. On the other-hand, pupils must be made to see that it is only the starting point of further thinking as to what other laboratory or live problems

arise out of the topic or principle learnt for immediate solution, so that they may be favourably impressed with the usefulness of what they have learnt, developing their power of independent thinking.

The writer of this article, in his capacity as the Science Lecturer of the Training College, Trivandrum, for over 18 years, has had ample opportunities of acquainting himself with all kinds of literature relating to the principles and methods of science teaching in schools and watching the effects of one method after another on the boys, with scientific interest. He has come into intimate contact with most of the science teachers in Travancore and Cochin schools, and demonstrated to them the possibilities of the problem method in Physics teaching especially, on the lines detailed above. They have been made to see how much more effective it is to approach a topic or principle in Physics with two or three familiar problems and what an amount of sincere enthusiasm is exhibited by the pupils when they are asked to solve half a dozen well-chosen problems, illustrating the varied applications of the principle which has been made clear to them by actual experiments. The interest thus aroused in problems soon becomes infectious and pupils begin to display a lack of satisfaction when the teacher's stock of problems falls short of their powers of solving them, or does not tax their acquired shrewdness to the fullest extent. The viewpoint of every Physics teacher must be to create such a healthy attitude in the pupils and to confront them with more and more problems later on, for solution independently of the teacher. There is no denying the fact that the soundest and surest test of the pupils' mastery of a law or principle is their ability to attack any problem, bearing on it with

perfect ease and confidence. They deserve no credit at all if they solve the problem, *e.g.* the relative weights of two solid cylinders of the same material whose diameters are as 1:2 and heights 2:1 respectively, with the laborious and meaningless work of assuming some exact dimensions, calculating their exact volumes and thence their weights further assuming some density, and finally giving the relation asked for in the shape of two fractions, whose ratio 1:2 he is not sure of even at this stage. This is just what 90% of the pupils do in public examinations for want of complete confidence in what they suppose to have learnt. How best to work out the salvation of such less than average pupils in our schools is the immediate problem which every teacher must face with all the caution and resource he could command for success in his work.

The writer has done the first spade work for his less fortunately placed friends and brother teachers in charge of science work in schools all over the Presidency by publishing a new-book styled "*1000 Problems in Physics*," (Price 1 Re.) including test questions, brief notes, model solutions and very cautious hints for difficult problems for the guidance of those teachers and pupils who are open to conviction and want to profit themselves by his experience and patient research in the field of science teaching. Thanks to the warm reception it has already had in Travancore and the kind testimony of its teachers as to its being a book full of inspiration to teachers and pupils alike, and worthy of every attention bestowed on it to raise the present dead level of science teaching in our schools. It will be found to cover the Physics Syllabus for the S. S. L. C. Examinations in Madras, Mysore, Travancore and Cochin so far as it relates to the field of Hydrostatics, Pneumatics, Mecha-

ics and Heat. A brief and descriptive summary of its contents is appended below for the information of teachers outside Travancore with a view to invite their sympathetic scrutiny and response, if they have any scientific curiosity to see what the book is like.*

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* "*1000 Problems in Physics*" with test Questions, brief notes, model solutions, and hints for all difficult problems, and answers. Price 1 Re. For copies apply to the author. Mr. P. A. Sankaranarayana Iyer, M.A., L.T., Senior Lecturer, Training College, Trivandrum.

loss of weight, unequal weights balancing in liquids of different densities, the weight which a boy can lift in water and in other liquids etc.

Ch. 4. Floating bodies. (Over 80 Qns. and exercises) hydrometers of constant and variable immersion, test tube and wooden floats, icebergs, rafts, buoys, life belts and sinkers, balloons, submarines, ships, and combined floating boats for calculating the wts. of motor-buses and other heavy loads, and comparison of densities of solids and liquids by flotation etc.

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WILLIAM TELL OF SCHILLER— A CHARACTER STUDY.

By MR. V. SREERAMULU, B.A., L.T.,

M. H. School, Narasaraopet.

HISTORICAL, AND THE PLOT.

TO understand the character of William Tell, we should know at least briefly the history of the times. The action of the drama is laid at the close of the 13th century, when the three Cantons of Switzerland, Uri, Schwyz and Unterwalden confederated for the safeguarding of their chartered liberties against the headstrong encroachments of the House of Austria.

The cantons had enjoyed a kind of self-government under the protection of their feudal lords, subject to the general control of the Emperors of Germany. Later on the districts broke up into separate communities, but enjoyed special immunities and privileges under separate charters from the Empire. Powerful families rose into power and gained ascendancy over the rest. Of these the Counts of Hapsburg were the chief. Rudolph of Hapsburg rebelled against the then Emperor, and ultimately became the Emperor himself; when the liberties of the people were greatly threatened. His son and successor Albrecht showed his grim determination to subjugate completely the Cantons to his rule. No man came but told a harrowing tale of the tyrannical measures employed to the utter desperation of all the people.

The Kaiser's prefects in their unbridled insolence molested the chastity of innocent women, conscribed unwilling labourers in the construction of their strongholds, imposed heavy fines for trivial offences and extorted them mercilessly at the point of the sword. The three Cantons resent to a man the

measures adopted to crush their independence. Even women incite their husbands to concert ways and means to end this unprecedented tyranny.

There were not renegades wanting in their camp. But these later learn their folly and in bitter contrition return, and make common cause with the people.

Milder methods having failed to enforce their claims, the men of the three Cantons meet in secret council, and resolve upon rising in arms against the prefects in their keeps.

Every man has to bow to the hat of Austria. Tell passes by, without paying homage to the hat; for which he is arrested. The Viceroy offers to pardon him if he shoots an apple placed on his child's head. Tell shoots with unerring aim, and hits the apple. But he is taken captive; from which captivity he manages to escape at an opportune moment. Later he kills the Viceroy.

The beacon fires are burning on all hill tops. The keeps of the prefects are burnt down and the prefects fly for their lives.

The land is rid of the pest of tyranny and William Tell is the hero.

WILLIAM TELL.

Tell is a simple peasant, living in ease and comfort on his ancestral soil, teaching his sons archery which he has practised to perfection. He is a hunter and an expert marksman. He tastes the jest of life every day by conquering it anew. Every day he runs many risks on the icy steep, leaps from crag to crag hard by the yawning chasm in pursuit of game trusting God, or 'tempting God' as his wife puts it. He is quick of eye, sound in nerve and very nimble. He fears

no foe, for he always does what is right. His sturdy arm, his brave heart and his clear conscience are his best shield. Once the Viceroy came face to face with him, and recognising him as Tell whom he had fined for some small offence, quaked with fear and turned ashy pale.

He is not a man of words. His is not the gift to powder or to plan. When the men of the Cantons meet to decide upon a plan to end their unbearable tyranny, he does not go there, though his heart is with them, and he abides by their decision. But he will not fail in deeds. Even the lost lamb Tell plucks from the abyss. He thinks of self last of all. Bumgarten, who is chased, begs the ferryman to row him across the lake to safety. The ferryman hesitates and eventually refuses to do so as a fearful storm is impending. Tell comes to the scene with "who is this who supplicates for help?". He learns Bumgarten's need, and finding the ferryman obdurate to his pleadings to dare, because there is the need for it, he himself braves the dangers of the swelling surge, the raging billows and the eddying whirls, and rows the suppliant safe to the other shore. "A brave man thinks on self last of all."

"No man shall go un comforted from Tell." He will do what lies in him. Duke John after murdering the Emperor runs away for safety. He comes to Tell and reveals himself. Tell ever loyal to the Empire though he resents of tyranny of the Viceroy abhors the murder committed and asks the Duke not to pollute his stainless heart. But he has also pity for him as man to man. He will do what he can for him—so young, of lofty lineage, a suppliant though a parricide. His ideas of hospitality do not shun even a murderer. He regales him with a bounteous repast and asks him to

go to Rome to the Holy Father to report of his sin, to confess and be purged of it.

His presence of mind, his resourcefulness are remarkable. Tell at Altorf passes the hat of Austria unheeding, without paying homage to it; for which he is arrested. Gessler the Viceroy comes there. He taunts him 'you are accounted the best shot; let us try it. Shoot an apple placed on your boy's head' Tell explains that his blundering lay not in contempt but in heedlessness. But the Viceroy would not be satisfied but wants him to shoot. If he fails he shall die. A father to risk his son's life! He would rather die. But no, if he does not attempt it, the boy too would be put to death. The murderer of his child, if he shoots and hits him or even if he desists from it! The people throng round the Viceroy, and beg for mercy in this case, and spare a father from being an assassin of his own child. The boy stands steady with the apple on his head. Tell takes the bow, the world swims before his eyes, he offers his life earnestly and passionately, but the hard-hearted tyrant would not accept it. He steadies his arm, shoots with unerring aim. The apple is hit. The boy is unhurt. Oh! the joy of it! But Tell has another arrow with him ready to pierce the heart of Gessler if the first hit the boy. He has vowed in his heart that his next shaft shall be aimed at Gessler, and it would not miss.

Bound in chains he is embarked on a vessel. A furious storm bursts forth. The steersman's heart sinks. Tell is asked to steer the vessel. His fetters are removed. He stations himself beside the helm and marks a point where it is easy for him to spring to land. When the boat approaches the point, he springs with his bow to a jutting ledge and

pushes back with his heel the boat to reel upon the boiling surge.

His next thoughts are of revenge. He sends word home that he is safe, that his God has succoured him. He stations himself by a narrow gorge, for Gessler is to pass that way. He has lived a peaceful life. The Viceroy is sent to rule, of course, sternly but not with fell and murderous caprice. The Viceroy is a scourge to all the land—proof to sorrow's piteous prayer. He has trampled under his foot the freedom of the people. There is not a moment when some harrowing tale of his violent doings is not heard. With pitiless and fiendish glee he has asked Tell to shoot the apple on his child's head. His cup is full, his sands of life are run. To shield his helpless boys, his loving wife from the consuming rage and tyranny of the Viceroy, to shield their innocence from the fell fury of the tyrant's spleen, to free his country from its burthen of thralldom, he has vowed his next shaft shall pierce the heart of Gessler. That vow is a sacred debt. To redeem it he is here. This will be his master shot and he would win the noblest prize. He would free his country.

Gessler passes that way and Tell shoots his arrow. There is here no wavering, no hesitation as when he had to shoot at the apple. His is a practised hand. His art has grown an instinct with him. When his aim was unerring even with his mind agitated, would it miss now—now that it is aimed at the country's tyrant—at the man who has turned his innocent and harmless feelings to bitter hatred? Gessler knows it must be Tell's hand that aimed the shaft—so sure and so vengeful. Now the debt is redeemed. That was his master shot and that was his last shot. His skill in archery has been

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*crowned with success at last. His country is safe. His revenge is gratified. He has no more to do with his bow. He hangs it in a sacred shrine.

To Duke John, he differentiates between the two murders. His was a father's just vengeance to defend his children, to guard his hearth and home from a dreadful doom. But the other's was ambition's bloody work, murdering his own kinsman and his lord. How could any father be calm who has endured his pangs? But did the other commit the murder to defend his children's cherished heads, to guard the sanctuary of his home? Tell only avenged the holy nature which the other has foully shamed. He can raise his blameless hands to heaven and curse the other's deed. Thus he cannot congratulate him on his bloody deed, but he will have pity for the man in spite of his murder. He would show him hospitality, would feed him full but would not allow him to abide in his house.

He is the hero of the nation. With no tinge of selfishness in him, ever ready to help the needy even at the risk of his own life, he has killed Gessler, the worst tyrant, in the height of his pride and insolence when he arrogantly spurned at a suppliant woman. He had rid the land of its thralldom. He is its shield, its saviour.

The beacon fires are blazing. Freedom's glorious day has dawned. The valley in front of Tell's dwelling is filled with joyous crowds that wish him long life and happiness.

A FEW RECENT WORKS ON LINGUISTICS.*

By

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THE Science of Linguistics has not yet received the degree of importance which is legitimately its due. For one thing, earnest workers in this comparatively new field are so few all the world over; further, the works of these few, despite their priceless value in the matter of opening out new vistas for the investigation of the progress of human culture, are treated with a certain amount of unmerited disfavour by those working in other fields. Notwithstanding these discouraging factors, the work of a few capable devotees, carried on along scientific lines, has secured for this new science a niche in the great Temple of Sciences, relegated though the niche may be to an obscure corner in undeserved neglect. There are learned centres in Europe and America where the systematic study of the subject is being pursued. Paris, for instance, has to-day become a veritable *foyer* of linguistic research; a distinguished band of scholars are, by their eminent work, raising the new science in the estimation of the learned world and even of the general public. The School of Oriental Studies in London is another important centre of linguistic

research. There are also individual scholars in Europe and America, who pursue this subject allured both by its intrinsic fascination and by its usefulness for the investigation of human evolutionary progress. In India too, which we can rightly claim as the first home of systematic grammatical analysis and linguistic speculation, a new impetus has been given to the study of modern linguistics by the recent formation of the Indian Linguistic Society,† mooted and organised by scholars like Profs. S. K. Chatterjee, Taraporewala and Siddheswar Varma, who are equipped with the best training and experience that both the West and the East could afford.

Workers in the sphere of Linguistics may be said to belong to two classes roughly: those who find in its study the unalloyed joy of the intellect, the intrinsic satisfaction that the disentanglement of knotty problems would give; and those who find in it a means of widening and deepening our knowledge of the history of the evolution of the human spirit. Instances of scholars who are equally keen on both these aspects—on what we might call the “microscopic analysis” and “telescopic sweep”—are so rare that their very rarity entitles them to special homage at the hands of all lovers of knowledge. To this unique group belongs Pater W. Schmidt S.V.D., the eminent philologist of Vienna. He sees far and he sees deep. He has devoted years to the intensive study of what he has called the *Austrian* languages, and his works on this subject (like *Die Mon-Khmer*

† The central office of the *Indian Linguistic Society* is at present at Lahore, the present Secretary being Mr. Gauri Shanker, M.A. An appeal has been made to all those interested in Indian Linguistics, requesting them to enrol themselves as members of the Society. It is to be hoped that this appeal will meet with quick and adequate response.

* 1. *Die Sprachfamilien und Sprachenkreise der Erde* von Pater W. Schmidt, S.V.D.—With an Atlas containing 14 maps—Published by Carl Winters Universitäts-buchhandlung, Heidelberg (Germany).

2. *A Bengali Phonetic Reader*, by Prof. Suniti Kumar Chatterjee, M.A., D. Litt.—Published by the University of London Press.

3. *Bengali Self-Taught*, by Prof. S. K. Chatterjee M.A., D. Litt.—Published in Marlborough's ‘Self-Taught’ Series, by E. Marlborough & Co.

Völker) have remained so far the only authoritative basis for all students of Austrian. Pater Schmidt's study of Austrian alone would entitle him to a first-class reputation; but he has accomplished much more. Starting from the immediate results of his earlier work, he has cast his eyes over a wider horizon and boldly (and in our opinion, not unsuccessfully) tried, with the help of ethnology and sociology, to reconstruct the beginnings of human culture. The sweep of his vision is phenomenally wide, and though he does not claim to have been able to substantiate all the numerous problems he tackles as satisfactorily as he would desire, he has laid down certain rules and postulates which, so far as they go, are incontestable and would be of infinite help to future workers. All these observations and conclusions scientifically worked out during the course of several decades are summed up in his recently published work: *Die Sprachfamilien und Sprachenkreise der Erde*. This work embodies the results of the researches of almost a life-time; it is indeed a *Riesenwerk* such as we rarely come across in Linguistics. The book is not exactly a series of grammatical sketches of the various language-families of the world; indeed the first portion of the work, which contains a description of language-families gives us no speech-material at all, but on the other hand gives only a general account of the affinities of the various language-groups and of the progress in research that has been made in connection with each of these. The monumental character of the work is due to the Second Part which contains observations and conclusions unequalled in their comprehensiveness and suggestiveness about the origins of culture. The First Part describes only the *Arbeits-*

instrument with which the author has succeeded in drawing his conclusions in the second portion of the work, and with which future scholars could extend and amplify these results. The First Part thus aims at giving a conspectus of what the Science of Linguistics has accomplished so far: “Simple as this portion of my work may appear to be, it should sing the *Halleluja* of the Science of Linguistics,—that pure, disinterested science which is held in such little esteem in “practical” every-day life and by many specialists too. Only those who have taken part in these labours can estimate what an enormous amount of silent, unselfish work has been carried on in Linguistics.”

The Introduction to the work, covering about 38 pages, contains a clear account of the author's attitude to questions like the origin of language, the speech-faculty of primitive man, and the history and accomplishment of the science of General Linguistics. The author sets his face against the “Evolutionist” theory and marshals valuable arguments against the view that the primitive man was little better than animals in the matter of speech-faculty. The *Homo alalus*, the so-called speechless ancestor of man, the author tries to show, is an unprovable myth. About the *oneness* (*Ureinheit*) of the language of primitive man—a vexed question in which *a priori* arguments have been advanced in plenty—the author refrains from giving a conclusive opinion, but he says (page 38): “sceptics (about this *Ureinheit*) have, however, to take note that the progress which comparative philology has made within the last thirty years in the discovery of the affinities of languages extending over continents and seas, justifies bolder hopes for the future.” The author's

own work in adumbrating the existence of language-spheres possessing common affinities, makes him inclined to view with a certain favour the theory of the *Ureinheit* of the language of primitive man.

The First Part of the work (which covers 227 pages) contains general observations on the important language-groups of the world. We in South India would feel interested in the account given of Dravidian on pages 119—122. Mention is made of some of the theories that have been propounded about the affinities of Dravidian:—to Bursbaski (*A. Trombetti*); to Australian (*W. Bleek* and *A. Trombetti*); and to Uralian (*F. O. Schrader*).

The Austric language-group—the author's special sphere—is dealt with at some length, and the author here reiterates his conclusion (first advanced years ago in his work *Die Monkhmer Völker*) that the Melanesian, Polynesian and Austro-Asiatic families are bound together sufficiently closely to be considered to form parts of a larger group.

It may be observed in passing here that the student of Dravidian might find valuable assistance from Austric in the reconstruction of Dravidian etymologies, if not, of the speech-history of Dravidian. M. Przyluski of Paris has recently demonstrated that Austric has lent numerous words to Sanskrit and suggested, further, that Dravidian and Austric should have come in close contact at a pre-historic age. This suggestion raises the question as to how far Dravidian may have been influenced by Austric in phonology and in vocabulary, if not in grammar. The character and extent of this influence could be investigated only through a comparative examination of Austric and Dravidian.

It is in the second portion of his work that the author elaborates, with an exceptional sweep of outlook, mastery of facts and precision of detail, some of those observations and conclusions about the inter-relationships of languages and cultures, with which the author's name will be for ever associated and for which he will be gratefully remembered by future researchers in this particular department of General Linguistics.

We have here far larger groupings and far more comprehensive linguistic parallelisms than any worked out before. The process adopted by the author is based on strictly scientific methodology. After singling out a few fundamental speech-elements and speech-characteristics in phonology, grammatical structure and syntax, and discussing their origin, distribution and development, the author notes down the various speech-families in which these features (which he terms *Form criteria*) are found in common. This provides him with a basis (called by him *Quantitätskriterium*) for the groupings of language-families into larger wholes which he calls language-spheres (*Sprachkreise*). Finally, as the last step, the correspondences and links between these language-spheres on the one hand, and the culture-spheres (based on ethnological and anthropological data) on the other, are pointed out, so far as the materials available would warrant. It fills one with admiration to note how the author's vision, especially in the final stages of his grand thesis, envisages, without overstepping the limits of methodology, a larger unity (almost cosmic in character) than any that any investigator into human origins has ever been able to give us before. Of course, as the author himself acknowledges in more than one portion of his essay, there are many de-

batable questions requiring further classification and research*. But there is no doubt that the distinguished Austrian scholar has erected, with unique scientific precision, a vast palace, whose foundations are laid on earth and whose spires overlook horizons of infinite magnitude and importance. We shall here briefly touch on the main topics dealt with in Part II.

In the region of Phonology, the author takes up four important features:

(a) The differentiation of *i* and *e*, and of *u* and *o* presents a problem which according to the author yet requires to be worked out. The *secondary* character of *e* and *o* in certain language-groups, as compared to *i* and *u*, is presented as a suggestive problem about which no conclusion is possible at present on account of the inadequacy of our materials, but which to future workers would be a task well repaying investigation.

(b) The abnormal vowels *ö* and *ü* are shown to be *secondary* in character, as they are

* The panoramic comprehensiveness with which *Pater Schmidt* envisages these problems renders it inevitable that he has to make use of certain hypotheses which yet form subjects of debate. Topics like the following have not yet emerged out of the sphere of controversy:—

(a) The question whether some of the form-criteria relied on by the author have had anything like the fixity which the author ascribes to them so as to make out their primitive character;

(b) the classifications based on anthropological and sociological data, on which unanimity of agreement among scholars is far to seek;

(c) the question whether intimate syntactical features like the position of the genitive, etc., could be borrowed by one language from another, or in other words, whether the psychological outlook of a language could so far change as to admit of alterations such as are implied in the above borrowings. The fact that some of the author's hypotheses are debatable does not detract from the value and excellence of his thesis which by its magnitude and methodology compels admiration.

absent in the most primitive culture-spheres. In passing, we may note that the author's observation in this portion of the essay, that *Koḍagu* has *ö* and that *Tulu* has *ü*, requires correction; *Koḍagu* has [ɔ], [e] and [ɛ] amongst other vowels, but no [ö], while what the author has described as *Tulu ü* is probably [u].

(c) The distinction between voiced and voiceless plosives is shown by the author to be non-existent or very uncertain and wavering in the most primitive cultural spheres. This is indeed a very interesting topic to students of Dravidian in which family the sonant plosives are all *secondary* in character, so far as we know.

(d) Another interesting phenomenon that *Pater Schmidt* points out (quite convincingly, in our opinion) is the *secondary* (derivative) character of the fricative sounds. The material adduced by the author in support of his view is sufficiently large to place the question beyond a doubt. It may be mentioned here, that despite recent attempts to postulate an original *s* for Dravidian, the present reviewer has always felt that *s'*, *s* and *c* of Dravidian are derivative in character. *Pater Schmidt's* observations shed interesting light on this question.

(e) The character of the initial sound (*Anlaut*) and final sound (*Auslaut*) of words is next discussed as another interesting *Form criterion*. The oldest cultural spheres show no complicated consonant groups as *Anlaut* but only surd + liquid; and as *Auslaut* liquid or nasal + surd.

In the region of grammatical categories, the following features receive very exhaustive discussion:

(a) The distinctions of number are shown to be quite conspicuous and elaborate in the older culture-spheres.

(b) The distinctions of gender are historically worked out; while the oldest culture-spheres lack all divisions of gender, different kinds of gender-division arose in the later culture-spheres. Accounts of the causes underlying the development of these divisions are exceedingly interesting.

(c) The various systems of the classification of numerals are described and distinguished according to the various culture-spheres in which they occur. The *pair-system* or the system of calculation in two's is shown as a characteristic of the oldest culture-spheres.

(d) The distinction between the Inclusive and the Exclusive forms of the First Personal Pronoun (met with in a number of Dravidian dialects which in the author's opinion borrowed them from neighbouring Austric) is established as a common feature of the oldest and some of the immediately subsequent culture-spheres.

A very interesting account of its origin is given on page 333.

The author's discussion of *Syntactical Features* is exhaustive, covering as it does 100 pages of Part II of the book.

(a) The most important among these is the elaboration of the author's thesis that the *affixless genitive* is prefixed in languages which employ inflexional and verbal *suffixes* or *post-positions*, and *vice versa*. This is a distinction which, as the author observes, is not a superficial one but a criterion which goes to the very root of the genius of a language, and with which the *geistesfunktion* of the peoples could be demarcated. The abundance of materials collected by the author bespeaks

enormous labour, and the problem is worked out in all its ramifications. The psychological connection between the *prefixing* of the *affixless genitive* before nouns and the *suffixation* of declensional and verbal endings is exposed by the author fully. Variations from this general rule, met with in many groups of languages, are all sought to be explained by foreign influence.

(b) Closely connected with the above are also the positions of the Accusative and of the pronominal subject in reference to the verb. The author points out in reference to the close similarity between the Genitives and Accusatives in respect of their positions: "Summing up, we can lay down that the position of the Accusative stands in an inner psychologic relationship to the position of the Genitive, in such a way that the prefixing of the Accusative goes along with the prefixing of the Genitive. The psychologic similarity lies not in the fact that the Accusative stands in a kind of genitive-relationship to the verb, but that both Gen. and Acc. originally had a general undifferentiated relationship in origin and function: the Gen. to the Noun, and the Acc. to the Verb."

So far as the post-positional character of the pronominal subject in Dravidian is concerned, the author is of opinion that it is due to the influence of the Austric family in which the postfixing of Genitive, Accusative and Pronominal subject prevails.

(c) The position of the Adjective in reference to the Noun qualified is also discussed; after an enumeration and classification of instances from various language-groups, the following conclusion is reached:

"Originally the Adjective was post-fixed to the Noun, so that there was no possibility of

mutual influence between the position of the Gen. and that of the Adj., since the prefixing of the Gen. was original. At a later stage, the position of the Genitive began to exercise its associative influence upon the position of the Adj. also." The prefixing of the Adj. in Dravidian, for instance, is to be explained on this basis, according to the author.

The author next classifies the *Speech-spheres* on the basis of the common occurrence of the above peculiarities in the various language families. He distinguishes three main types, each having a set of common characteristics (phonological, grammatical and syntactical) of its own: (a) the most ancient spheres (Urkreise), (b) the Primary speech-spheres which are sub-divided into the Northern, Southern and Middle varieties, and (c) the Secondary and the Tertiary spheres.

The oldest speech-spheres are, generally speaking, characterised by the absence of the abnormal vowels, of the differentiation of i, e and u, o; of the sibilants and of the distinction between voiced and unvoiced plosives; by the presence of the simpler varieties of Anlaut and Auslaut, by rich distinctions in Number, by the simple pair-system of numeral-calculation, the Inclusive and Exclusive First Personal Pronoun, the prefixation of Gen., Acc. and Pron. subject, etc.

The Primary speech-sphere is divided into three groups, each having a common set of characteristics. In the opinion of the author, Dravidian belongs to the South Primary speech-sphere but has suffered the influence of the Middle speech-spheres also. The postfixing of pronominal subject, the presence of the Inclusive and Exclusive First Personal Pronoun, and the distinctions of gender (masc. and fem., living and non-living) in Dravidian

are to be traced to foreign influence, presumably Austric.

Finally, a commendable, but in the nature of things necessarily tentative, attempt is made to find out how far the language-spheres thus worked out correspond to the various primitive cultural spheres known to man. On the whole, the author finds a fair degree of correspondence between the results of linguistic classification and those of sociological and ethnological investigation. Variations from this correspondence are bound to occur and, as the author observes, nothing would be more futile than to draw conclusions from linguistic data without strict and scientific reference to the materials that ethnology, sociology and anthropology place at our disposal; but the fact remains that, generally speaking, there does exist a fair degree of correspondence between the results of linguistic and sociological classification.

Pater Schmidt's work marks an important milestone in the history of the development of the science of linguistics. It illustrates, as very few other works of recent times have done, what linguistics in alliance with ethnology, sociology and anthropology could do to illuminate the origins of human culture. No student of linguistics, whatever the particular department he may be occupied with, should fail to acquaint himself with Pater Schmidt's thesis, if only to realise the potentialities of the subject he is tackling, and the prospect of unguessed results if the subject is intensively pursued along the lines so brilliantly chalked out by the distinguished Austrian philologist.

* * *

A Bengali Phonetic Reader (published by the University of London Press, Ltd.) from

the pen of the celebrated Bengali scholar, Dr. S. K. Chatterjee, is a valuable contribution to the literature of Phonetics. Besides a valuable Introduction, it provides phonetic transcriptions of a series of texts, each representing a particular literary form. The texts include a farce composed by Tagore, two specimens of letter-writing (from the works of Tagore and of Vivekananda), a short story by Promotho Choudhury, and an extract from the celebrated Bengali humorous work, *The Sketches of the Hooting Owl*.

The transcriptions, which are in the I. P. A. script are provided with literal (word-for-word) English translations. There is a vocabulary of Bengali words and phrases (with phonetic transliterations) at the end.

The Introduction contains a scientific account of the essentials of Bengali phonology. The chapter on the *Intonation of Bengali* is a new feature distinguishing this work from the author's *Brief Sketch of Bengali Phonetics*, published some years ago. The introductory account of the sounds and of the sound-attributes singles out the characteristic peculiarities of Bengali. There is also a short *skeleton grammar of colloquial Bengali*, appended to the Introduction, apparently for the benefit of students of Comparative Phonetics who may not be acquainted with Bengali.

The book will be found indispensable by every student of Comparative Indian Phonetics. Of particular interest to him are the following: the affricates, the retroflex ʈ , ɖ which latter, it may be noted, differ from Dravidian cerebrals ʈ , ɖ , in the fact that the point of articulation for the latter is farther back), the cerebral ɽ , the characteristic Bengali sibilant, the frictionless glide sounds ɔ and ɛ , consonant groups like kt , pt , etc., in

which the first plosive element is fully exploded (contrast the value given to such groups in Sanskrit words pronounced by South Indians), the half-open bilabial vowel o , the absence of the central vowel a (contrast other Indian languages), the shades of length of Bengali vowels depending upon the rhythm of 'the sense-group, the dynamic stress and, last but not least, intonation in Bengali.

* * *

While Prof. Chatterjee's *Bengali Phonetic Reader* is intended exclusively for the student of Phonetics (and of Linguistics, generally), his *Bengali Self-Taught* recently brought out by Messrs. Marlborough & Co., in their well-known *Self-Taught Series* caters to the needs of the layman, as all books in this series do; but it also provides an excellent discussion of colloquial Bengali which will appeal to the specialist. Messrs. Marlboroughs could not have made a happier choice for the authorship of the book. A more erudite student of Bengali and of Indian languages than Prof. Chatterjee cannot be thought of. But Prof. Chatterjee is far more than mere *savant* working within the four walls of his study: he is a scholar who, while having won the blue ribbon of linguistic research, has cultivated other tastes also. He is a much-travelled man, a connoisseur of art and a discerning student of ancient Indian cultural movements. These varied tastes have equipped him with a wider outlook and a deeper sympathy than are usually found in mere researchers. This dual equipment of the author has made the small volume on Bengali in the *Self-Taught Series* a masterpiece of its kind. The envisaging of the needs of the foreign student of Bengali goes hand in hand with suggestive concision and

accurate scholarship. Besides the usual features found in the *Self-Taught* books, there are certain chapters in this volume, which add considerably to its usefulness for the student who desires to know more of the genius of the Bengali language. The Introductory portion (convering 26 pages) dealing with Script and Pronunciation, Phonetic Transcription, Accent, etc., provides the reader not only with the information necessary for the acquisition of a working knowledge of the language but also with plenty of suggestive material for a deeper study of the language.

One great difficulty for the foreigner who begins to tackle Bengali is the colloquial (Calita Bhāsa) which differs considerably from the literary dialect (Sādhu Bhāsa). None of the extant grammars of Bengali deals satisfactorily with this aspect. Beames's Grammar and Wenger's Treatise merely touch the fringe of the subject, while Anderson's more recent Manual does not give an exhaustive treatment. Prof. Chatterjee has in this book rendered the path very easy for the foreigner by keeping in view the colloquial forms throughout, side by side with the literary forms.

The scientific description of the Bengali sounds is such as Prof. Chatterjee alone can give; the disparity between sound and spelling in Bengali, the peculiarities of Bengali o (ɔ , ó , etc.) the mixing-up of sibilants in Bengali, the cerebral ɽ , the Bengali consonant groups, etc., are well described.

Scientific accuracy in the evaluation of sounds is ensured by the author's representation of the sounds in the I. P. A. script in one chapter of the Introduction.

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The vocabularies and conversational sentences show that special care has been exercised to make them as representative as possible of Bengali life and Bengali conditions: for instance, the chapter on *Eating and Drinking* reads almost like a connected essay on Bengali dietary.

But the most interesting part of the book is the *Grammar* which is a masterpiece of accurate and scholarly condensation. The essentials of grammar are all here, both the literary and the colloquial forms being given side by side. The preliminary note on Epenthesis, Umlaut and Contraction, intended to explain the basic principles of colloquial change; the treatment of compound tenses, of causatives, denominatives and formative affixes; the brief but valuable account of the syntactical features of the language; and above all, the explanation of colloquial variants everywhere,—are features such as are met with in no other grammar of Bengali.

Many people in South India anxious to read Bengali works, and particularly Tagore's, in the original, are baffled by the colloquial dialect which is increasingly being employed to-day by the writers of Bengal. The *Kathya Bhāsa* has come to stay in Bengal; and almost every modern writer now follows the example set by Tagore, Promotho Choudhuri and others several years ago in the face of considerable opposition. I know of several South Indian students of Bengali who, while they are able with their laboriously-acquired knowledge of literary Bengali to read Bankimchandra's works, are absolutely helpless, owing to their ignorance of the colloquial, in tackling the writings of more modern writers employing the colloquial. To this class of enthusiasts and to the larger class of people in South India, who would desire to cultivate first-hand acquaintance with the "second greatest literature of the British Empire," a more suitable text-book than Prof. Chatterjee's *Bengali Self-Taught* cannot be recommended. Further, let us also add that the student of Indian Linguistics who is interested in the principles of *colloquial change*, will find valuable suggestions in the book.

"THE PLACE OF TRANSLATION IN THE TEACHING OF ENGLISH."

By

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THE following lines do not lay claims to any uniqueness or originality. This subject, which is, perhaps, as old as the teaching of foreign languages, has been written, discussed and commented upon by educationists throughout. Though there may be very little to instruct and inspire; this may at least serve as an emphatic reminder to those entrusted with this work of the place of the mother-tongue in the teaching of a foreign language.

ENGLISH INDISPENSABLE?

The study of foreign languages in India constitutes a peculiar problem, a correct examination of which is as essential to a proper understanding, as the doctor's diagnosis is for a proper remedy of human ailments. It may be reiterated at the very outset that the study of English in Indian schools bears very little resemblance to the study of either French or German in England. Whereas it is optional and cultural in the case of the latter, it becomes indispensable and practical in the case of India.

Apart from all its claims as a language of true culture, with all its contributions to Science and Philosophy, and its vast literature, English has been a unifying factor in the political administration of the Indian Empire. In default of any of the indigenous languages becoming the 'lingua franca' and 'adequate vehicles of economic and political thought' of this country, English is fated to be the language of provincial autonomy and as such the federal language. It is in fact a

limb of connection with the life of the outside world, facilitating the 'travel and traffic of the mind' and that 'interprovincial and international commerce and industry on which the economic future of India largely depends.'

As far as the Indian school is concerned, there is another weightier consideration which we cannot ignore, viz., that it becomes the medium of instruction in the non-language subjects of the school curriculum. Thus English as a language of culture and administration combined with its practical necessity, becomes unavoidable in the case of the Indian student.

With all this, we must scrupulously resist the 'temptation of pitching our standards too high.' The Department also aims at 'simplicity and directness of expression.' The significance of these remarks will become clear, if we realise the limited time at our disposal, and the standard of accomplishment which the average Indian pupil has to attain within this period. All this is for reasons of economy: and we must 'limit our enthusiasms' to that indispensable minimum of attainment, and chalk out our plans of work with that end in view.

THE FOURFOLD AIMS.

Before proceeding further, we may pause to consider the fourfold objectives in teaching English. The first is ability to speak in the foreign language with accuracy and ease the 'language of daily conversation.' The latter part of the statement is important as making a distinction between that high-flown literary language and that of daily conversation, which is obviously more vital and real. The second is ability to understand the foreign language when spoken by another. This emphasises the fact that the two facul-

ties of speaking to oneself, and that of understanding when spoken to, should not leave each other far behind, but develop harmoniously and in good proportion. The next aim is ability to write in the foreign language. Writing, in this connection does not mean anything of an elevated order, but simply about those every-day occurrences, which really interest the pupil. The last and final, is ability to read or to understand what is written. This also does not by any implication carry with it a literary bias, but limits itself to things within the pupil's 'field of interest.' These may be further classified under broader sub-divisions called the 'active' and 'receptive' sides of language study—the first and the third coming under the former, the second and fourth under the latter. The abovementioned division is of course, arbitrary, but it is convenient, in so far as it prevents any undue attention paid to any one aspect to the prejudice of the other.

METHODS OF TEACHING: A SURVEY.

The means of teaching a language may be many, but we may confine ourselves, at present, only to those that are popularly called 'specific methods of teaching.' We may just mention them in passing, making a few references to each of them here and there. Broadly speaking they are the 'Translation,' the 'Direct' and the 'Blend' methods.

The first marks the earliest stage of teaching languages. With all its merits, it was found wanting in many of those essentials of good teaching, and as such was crowded out of the field and relegated to the background. The second was an improvement on the first, but being a violent reaction, swung to the other extreme. It was in its original purity too extreme to be adopted, and a golden mean

had to be struck and consecrated under the name of the 'Blend Method'. As its very name signifies, it is a compromise of the two extremes and is more rational and realistic in its methods of instruction. It differs from the other two by the freer use it makes of translation in its programme of work and its insistence on the conscious acquisition of language as distinguished from sub-conscious assimilation. We may dismiss all the rest as unnecessary, and consider it under its one important aspect, viz, the use it makes of translation which, for convenience, we may examine under the following heads.

1. TRANSLATION FOR EXPLANATION.

It had been customary in the 'regime' of the Direct method to explain the foreign language by three recognised means. The first was by direct material association, i.e. by object lessons, by models, and by gestures and mimicry. This undoubtedly is a good method, most useful in the lower classes. They serve to establish a direct bond between the words and sentences of the foreign language with the ideas they express, by a direct appeal to the sense of sight. Some call it therefore a 'visualising method'. Be it called as it may, this is not free from serious limitations. *Prima-facie* it is evident that this is only applicable to concrete ideas and those expressing action. Even here clearness is not vouchsafed to the learner, for "a cube of teak may suggest the idea of 'wood' as well as that of 'cube'. This is the reason why we should appeal to the pupil's mother-tongue for explanation. For be a teacher ever so wisely counselled as to inhibit, puritanically, the mother-tongue in the class-room, the tendency of the pupil to associate the new word with its vernacular equivalent is irresistible. This is natural and reasonable—natural

because the vernacular habits of speech tend to persist, and reasonable because it is based on the acknowledged pedagogic maxim of proceeding from the 'known to the unknown.' As Prof. Sweet finely puts it "he (the pupil) has to unlearn the other language (the mother-tongue) and to struggle continually against the formidable difficulties caused by cross-associations."

Further this method fails to explain the subtle shades of meaning between word and word. He should, of course, be a very ingenious mortal who could drive home to the pupil's mind the difference between 'tremble' and 'shiver' by gesture and gesture alone. In this connection, Sweet says "the argument that the substitution of visualising methods for translation, prevents cross-associations is a fallacy."

Even now, fanatics of the type of Mr. Yates maintain, that the "class-room is to be like a foreign country, and the pupil like a man who is a sojourner in a foreign land". Opinion is gradually changing and it is being proved, that the 'dead set' against the use of the mother-tongue prevalent in Direct Method circles, is an untenable view. There need be no 'qualms of conscience' in using the mother-tongue for purposes of explanation. Prof. Findlay writes "it is foolish for the sake of the Direct Method principle, to try and get round the use of English equivalents by pictures and gestures, although they are a useful aid. What the teacher ought to do is to give those necessary explanations and thereafter to drop reference to the vernacular, allowing it to fall below the threshold of consciousness."

The other means of explanation which the Direct methodists advocate are by definition

and explanation in the foreign tongue itself. Mr. Yates says on this point: "Nor does a translation conduce to clearness: It does not arrest the attention. On the other hand a definition or a description forces the attention to the meaning and averts the mechanical substitution of symbol for symbol". They even go to the very extent of maintaining that explanation by translation is more indirect than either by explanation or definition in the foreign language. "This statement is not always set forth in categorical terms: it is generally implied rather than asserted. It is precisely this tacit assumption of unproved premises that constitutes what we shall call the fallacy of the Direct Method."

Macaulay in one of his Minutes wrote: "We learn one language our mother-tongue by noticing the correspondence between words and things. But all the languages which we afterwards study, we learn by noticing the correspondence between words in these languages and the words in our own mother-tongue." We read in Modern Studies, "Much time is wasted by unskilful teachers in endeavouring to explain in the foreign language a word or phrase that becomes at once intelligible if the English equivalent be given, while the occasional collation and comparison of the two modes of expression is indispensable if one of the advantages of learning a foreign language is the cultivation of our own." We may conclude this in the words of one recent writer who says that 'the vehicular language for all explanatory matter should be that which is best known to the student.'

2. FOR CONTRAST AND ILLUMINATION.

This is a point which is frequently overlooked in every day class-room practice. One

sees teachers beginning a lesson in grammar or any peculiar English usage, as though they are totally unconnected with the pupil's knowledge of the same in the vernacular. There is thus a sore lack of consistent co-ordination between the pupil's knowledge in the vernacular and the new material which is to be taught to him. The advantages of such a co-ordination can not be exaggerated. Dissociation means dissipation of energy, while to 'expose the bearings of what is being done in one branch of study upon what is being done in another is true economy as well in earning a language as in all education whatsoever. It is confirming, and reinforcing, or recapitulating, old matter through a fresh connection. More than any thing, the habit of discovering the connections between different sets of facts or ideas, is an invaluable constituent of an educated and efficient personality.' The lesson ceases to have an air of unreality and becomes 'set' within the experience of the pupil. As one writer has beautifully said "Education with inert ideas is not only useless: it is above all things, harmful." Conversely speaking, we may say that ideas in order to be useful should be active.

We may take for example a lesson in English Grammar, viz, Adjectives. Nobody can deny the resemblances existing between the functions of words in different languages, for languages being the product of the mind should conform to its laws. In this case an intelligent teacher would make use of the pupil's knowledge of vernacular grammar and finally give out the necessary English terminology. So also with peculiar constructions and usages in the foreign language, for example, the use of 'that' in indirect speech. What we do in all these cases, is not a literal, word for word translation for its

own sake, but translation in a modified form. In the words of one writer we bring in the vernacular 'for the sake of contrast. Contrast is for the sake of illumination, after illumination practice'. Translation in this form is no longer our enemy but our ally.

3. FOR TEACHING LANGUAGE ARTS.

It is almost a truism to say that language or ideas expressed without a proper arrangement and 'skilful disposition is useless. To be able to convey our thoughts most effectively we should at first gather and then arrange them in a suitable manner. The pupil should know how to divide and arrange his ideas under suitable headings and paragraphs. These considerations may drive a teacher to the extent of including these items in his main programme of work. These are good ideas, but poor stuff for practice. Teachers have been often ensnared by this *ignis fatuus* of 'language' instruction. Our object in teaching a foreign language is to habituate the pupil to certain language forms that are new, and anything that deviates from the main body of work is sheer waste of time. It is a wise principle that a student should not be burdened with the task of evoking fresh ideas in a foreign language in addition to the language difficulty. Mr. Wyatt emphatically says 'that to exercise the pupil in thinking out fresh matter or which is much the same thing, in trying to understand difficult ideas is to divert his energies from practice in language to exercises in thought.' At another place he says 'nor should we waste over management of matter, time which can ill be spared from practice in newly-acquired language, and concludes that it is the function of the vernacular teacher to deal specifically with such subjects as the use and place of chapter, paragraph, sentence, and word in the verbal communication of ideas; and to set special exercises to enable the pupil to realise the difference between the good and the bad

use of these and to acquire good habits by practice. The habit of intellectual organisation must be inculcated early in the pupils' school career and the early period of his career is that in which his habitual medium of thought is his mother tongue. For learning English begun at 8 or 9 years of age, to have first learnt to speak well in the vernacular is an invaluable preparation."

4. AS A TEST OF COMPREHENSION.

This carries us to the subject of translation as a regular school exercise. Without any discussion we may say that translation as an art is quite different from literal, word for word translation and as such quite unfit in any class except the higher forms of the high school. The purpose of this exercise is to make the pupil express in one language the nearest equivalent idea or series of ideas which he finds in another. "To do this at all adequately the pupil must already be familiar with the vocabularies available for his purpose in both the languages, and at any rate in the language into which the translation is to be made, the vocabularies must be 'working' or 'application' and not merely 'recognition' vocabularies."

In the order of their difficulty it is clear that there are three different types of translation—translation from vernacular to vernacular often called paraphrase, translation from English into the vernacular and from vernacular to English. The first has only to be mentioned to be dismissed and we may take up the second type.

We have stated at the very beginning the fourfold objects of language teaching—speaking, understanding when spoken, writing and reading. Of these the second and the fourth come within the scope of 'translation into the vernacular.' But it is obvious that other methods are available for teaching these

aspects of a language and it has been propounded by writers time and again that 'to introduce the vernacular unnecessarily is to divert time to vernacular practice which can be ill spared from practising English.' What then is this translation for? Mr. Wyatt answers this question as follows: "Translation into vernacular is the surest method of testing a pupil's progress in understanding English." The special function of this type of translation, then, seems to be to test better than anything else, the pupil's comprehension of the foreign language.

5. AS A TEST OF THE PUPIL WORKING VOCABULARY.

The third type of translation, *vis.*, 'translation into English' has also a peculiar function to discharge in foreign language instruction. But in this exercise, we do not test the pupil's comprehension of the foreign language nor his 'recognition' vocabulary but 'the extent and kind and grasp of his 'working' vocabulary.' This has also the peculiar merit of being graduated in difficulty according to the standard to which it is to be set. The passage in the vernacular may very easily be suited to our particular requirements and to the general standard of the class.

Another advantage which this exercise has, lies in its very difference from ordinary composition. A student who is given a subject to write upon, always chooses the 'line of least resistance' and manages to write upon the subject with the vocabulary he has. It is therefore possible for him to dodge the issue, by leaving out altogether the words and constructions which the examiner desires; and translation into English solves this difficulty best. In the beautiful term of O'Grady we 'chain' the pupil to a particular mould of thought which constrains him either to face it square, or leave it honestly.

At the same time we may sound a note of warning. Though these translations are excellent as tests, they are generally bad if resorted to frequently. As one writer has well said: "A good method of test need not be a good method of teaching."

CONCLUSION.

The above remarks may have gone some way to convince ultra Direct methodists about the place of translation in our methods of instruction. Time was, when men believed that a departure from the principles of 'direct' teaching, was considered to be a fall from grace, which grew by what it fed on. What we would like to urge is that our procedures in the class-room should neither be biassed nor 'wedded to our own conceits' but 'broad-bottomed' with greater reason and realism in its 'make-up.'

Madras and Andhra University Examinations.

HERO AS POET

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HOW WE GOT THE BI-ANNUAL LAW EXAMINATIONS.

By

Mr. S. SRINIVASAN, B.A. (Hons.), B.L.,

Tiptur.

BI-ANNUAL examinations were unheard of in the Madras University about fifteen years ago. I think they are now the rule rather an exception with a number of other Universities also. So far as Madras is concerned I think the beginnings of the change came with the bi-annual law examinations the first of which was held in 1916. There is a story hanging by the movement that brought this into vogue which, I hope, will be read with considerable interest at this distance of time. I am basing it on certain documents in my possession, and my justification for their publication now, apart from that of interest, is that it embodies also some valuable lessons. I must, perhaps, also apologise to friends for releasing these documents for publication, assuming that, at that time, any of them were invested at all with secrecy.

Fifteen years ago the Madras University was slightly different from what it is to-day. If it was not exactly what a great English statesman characterised of something else Indian—from his seat in the House of Parliament—it was nearly very near it: "wooden and anti-déluvian." It was most certainly 'wooden.' The governing bodies of the University were, by constitution, incapable of ready responsiveness to and sympathy for Indian feeling and sentiment. They were cast in the bureaucratic mould. It was from such a body of men in authority that we started a movement to wrench the "concession" of half-yearly law examinations for a couple of years.

In the year 1914 large changes were made in the courses of study for the law degree, and if I remember right, proposals were on the *tapis* to make the course itself a three-year one. It became necessary for a large number of us, studying under the old regulations, to finish the courses of study and pass the examinations as expeditiously as possible. Thus, in 1915, hundreds of students from all over the Madras Presidency precipitated into the Law College at Trivandrum which then afforded (as it perhaps does still) the privilege of putting in terms in the B.L. class after the completion of the F.L. course. To those who were not mindful of a degree but wished only for terms in the Pleaders'hip class it provided studies also on easy terms. This was unlike any facility in the Law College at Madras—which was and is still to-day—the only other Law College in the Presidency. There were friends from the northernmost points of the Presidency, such as Berhampore and Vizag as well as far south Tinnevely. Before we were a few days old, the idea was mooted amongst us that the University authorities should be approached to extend to us a couple of more chances to sit for and pass the law examinations under the old regulations. The idea was enthusiastically received and we found that the professors and the lecturers of the college were in sympathy with us. Thus before we were even a month old at Trivandrum; one of us, Mr. C. V. Ramaswami, B.A., broadcast a printed notice dated the 30th July 1915 which ran thus—

"At the requisition of F.L. and B.L. students, Law College, a public meeting will be held in the Victoria Jubilee Town Hall at 6 P.M. on Saturday, the 31st instant, to concert the necessary measures for memorialising the

University on certain aspects of the recent Regulations affecting the F.L. and B.L. students under the old Regulations.

Mr. H. S. Chatfield, B.A., Bar-at-Law, has kindly consented to preside.

Your presence is earnestly solicited."

Mr. Chatfield, who is now the Chief Judge (on leave) of the Travancore High Court, was then only a puisne Judge and Principal of the Law College.

We were all of us new and did not realise exactly that the Victoria Town Hall at which we had announced to meet was a building under the control of the Travancore Government. I well remember the midday of the 30th of July 1915 when realising this, we waited upon the Chief Secretary to Government, Mr. Vieyara, for an urgent letter to the Honorary Secretary of the Committee of Management, Victoria Jubilee Town Hall. We explained the purpose was harmless and that our Principal was to preside over the deliberations. The Chief Secretary was very kind and gave us a communication immediately marked very urgent and addressed to the Honorary Secretary. It ran thus—

Huzur Cutchery,
Trivandrum, 30 July 1915.

Sir,

I have the honour to request that you will be so good as to arrange for the Victoria Jubilee Town Hall being placed, free of charge, at the disposal of the Secretary to the Law Students' Memorialising Committee, Trivandrum, on Saturday the 31st July 1915, for the purpose of holding a meeting of the students.

2. The electric lights and fans, if wanted, should be charged for.

I have etc

(Sd) R. RAMALINGAM AIYAR,
for Chief Secretary to Government.

I remember we stepped in then into the Dewan's chambers also at the Public offices—I think it was Sir P. Rajagopalachariar then—and we invited him also to lend us the weight of his influence by gracing the meeting with his presence. On the 31st the meeting came off as arranged. There was a splendid and enthusiastic gathering at which all the Professors were present and a number of advocates and other gentry of Trivandrum. We had the programme also fixed up. After the convener's speech, the installation of the President and the latter's introductory speech, the draft resolutions were put to vote and carried. The first resolution ran thus—

i. This meeting of F. L. and B. L. students and others respectfully prays that the University be pleased to hold additional half-yearly examinations for the F. L. and B. L. candidates under the old Regulations in November or December 1916 and 1917.

It stood in the name of and was moved by the Additional Government Advocate, Mr. V. Subba Iyer. In the unavoidable absence of the seconder Mr. K. Kochukrishna Marar, B.A., B.L., one of the Professors of the College and at that time a leading member of the Travancore Bar, Mr. K. G. Sessa Iyer (now retired Judge) did it. It was supported by Mr. K. S. Venkata Ramani, now famous as the author of *Murugan* and other books.

The second resolution which ran as follows was moved by Mr. K. G. Sessa Iyer and was seconded and supported by Mr. T. Narasimhachar (now Advocate at Bellary) and Mr. Srinivasa Iyer respectively.—

ii. A Committee consisting of Messrs. E. J. John, B.A., B.L., K. Kochukrishna Marar, B.A., B.L., K. G. Sessa Iyer, B.A., B.L., P. A. Subramanya Iyer, B.A. (Hons.), T. S.

Srinivasa, Rao B.A., V. B. Sundara Rao, B.A., K. Raghava Menon, B.A. (Hons.), B. N. Sarma, B.A., and S. Srinivasan, B.A., with power to add to their number be appointed to draft the memorial in support of the above resolution and generally to take such steps as may be required to give effect thereto.

The third resolution appointing Mr. E. J. John, the Vice-Principal of the Law College, as President and Convenor of this Committee was moved by Mr. D. Krishnamurti (now, I think, the President of the Cocanada Municipality) and was supported and seconded by Messrs. S. Sarma and Padmanabha Menon respectively.

The fourth resolution authorising the Chairman to forward the resolutions to the University was likewise moved and supported by three others.

The meeting was a splendid success. Telegraphic messages of sympathy and support came from Madras and other places and it was clear that the movement had begun well, so far as it lay in the hands of the students.

The use of the Law College Hall was permitted for the Law Students' Memorialising Committee, as we came to be known, and on the 2nd of August we met to elect a Secretary and a Treasurer and also to concert the further necessary measures. The honour of Secretaryship fell on me while my friend Mr. Raghava Menon undertook the Treasurer's job. We were told that our work lay ahead of us in having to educate the Senators and enlist their sympathy.

We resolved at that meeting to collect subscriptions from "law students and their sympathisers" and to draft a memorial embodying our prayer and the grounds there-

for. Law friends in Madras wished to step into a line with us but Madras was different from Trivandrum. The position there was thus reported by my friend Mr. Chavali Venkata Krishnayya in a letter he wrote on 13-8-15:—

"My dear Mr. Srinivasan,

As soon as I saw your letter I caused a meeting of the Students' Representative Council to be held at which it was unanimously resolved to call a meeting of the B.L. students and submit the resolution for their acceptance. But when we sent the President of the S. R. C. to the Principal for the use of one of the halls, he said that the action of the S. R. C. was *ultra vires* and saw in this, our action, something unstudent-like. He would however consider, he said. Even should the Principal refuse us the use of one of his halls, we shall arrange a public meeting for the purpose. I shall let you know later."

The situation was interesting but if we could do all that we had done at Trivandrum with the support of our Professors and there was nothing unstudent-like in it, it was not clear why it should have been otherwise in Madras. So a telegraphic advice went to him "to avoid frictioning Head—arrange public meeting Pachaiyappa's—include F.L.—secure co-operation of Seshagiri Iyer, Ramachandrier, S. Srinivasiengar." The matter was taken before the Vakils' Association also, for according to a letter I got on the 27th of August from my friend Mr. K. V. Sundaresan, "Your bi-annual scheme has been submitted to the Vakils' Association in order to elicit the sympathy of those who have it.....If there is any feeling in favour of the movement, there may be a public meeting and Mr. Krishnayya will write to you."

On the 3rd of August the position in Madras appeared to be discouraging for according to a letter dated, The Moot Club, Law College—

"We have not been able to achieve anything substantial. It is a pity that we here in the metropolis, cannot claim the energy and the pluck even to copy you. Our failure however is not due to anything inherently dull or weak about us but to the apathy of the Professors on the one hand and the self-centred exclusiveness of the bigwigs on the other.

"We have not been able to obtain the co-operation of the Professors or the Lawyers. Anyhow we have resolved to hold a meeting though it may be purely of students on Wednesday next and pass the resolution.

"The memorial has not even been acknowledged by the Vakils' Association."

Five days later a cheering report came from the same quarter—first, a telegram and then a letter: "Meeting to-day Law College Hall Advocate-General presides."

"This evening we had a splendid gathering of students, Mr. Corbett as promised presided. Among the staff Messrs. Adiga and Kunhiraman were present. The Principal on principle did not attend. The Chairman while in full sympathy with our resolution expressed his approval of the 3 years' course. This, I fancy, may be quite consistent. He is to communicate the resolution to the Senate. What about the memorial? Won't you send it on for our signatures? I hope all possible arguments are embodied in it. Convey my best compliments to all our friends. Your telegram too was read."

Public memory is proverbially short but those who remember will testify that in those days there was no greater friend of Indians

than the late Mr. F. H. M. Corbett, the Advocate-General. His stay in Madras was very brief but among the services he rendered let me record this great help for us. Others like the late Mr. Justice Seshagiri Iyer and the late Prof. S. Subrahmanya Iyer of the Presidency College also extended to us their sympathy. Meanwhile we had collected statistics and drafted our memorial in the following terms:—

To
The Registrar,
University of Madras.

SIR,

At a public meeting held in Trivandrum on the 31st July 1915, we were appointed Members of a Committee to make representations to the University authorities in regard to the holding of *additional* half-yearly Examinations for the F. L. and the B. L. candidates who have completed or may complete their courses of study under the old regulations, recently modified.

We are glad to observe that the University has recognised the equitable rule that a change in the existing regulations should not prejudice existing rights. The University has allowed the old F. L. and B. L. Examinations to be continued up to 1917 and 1918 respectively.

We submit that the facilities already provided are inadequate and will not mitigate the hardship imposed by the recent amendments on candidates.

The Law Examinations govern admission to a profession. As such, among the candidates who sit for them are many who, after undergoing the full course prescribed, have hitherto been permitted to sit for the qualifying examinations when they felt themselves able to do so with some assurance of success.

A fair degree of stringency has always been the feature of the Law Examinations. This is natural, since a depreciation of the standard set for entrance to an important and influential profession must result in serious evils.

We do not ask for any lowering of the standards. We only desire that nothing should be done which would establish, now or hereafter, different standards for different batches of candidates appearing for the same examination in Law, *in the same year*, and that sudden variations in standard should be avoided from year to year.

We fear that these evils will necessarily appear, if the candidates under the old regulations whose number, so far as we have been able to reckon, amounts to between 2000 and 3000, are forced to take the restricted chances now provided in 1917 and 1918. Their examination, in such unprecedented numbers, must cause a strain on the examining machinery, tending inevitably to impair a uniform standard for all the candidates, and even efficient examining.

It would be noticed that taking the probable average of success in the first examinations to be not very much higher than at present, each succeeding examination will have to provide for an increasing number of candidates.

We would next submit that the opportunities already provided for the candidates under the old regulations are unduly few, whether one considers firstly, the facilities they would have enjoyed if the regulations had not been amended; or secondly, the general question of having only *annual* examinations in Law along with the rule that failure by a narrow margin in a single subject

out of many is as great a disqualification as failing in all the subjects; or thirdly, the practice of our University itself in regard to medical examinations or that of most other Universities in regard to *all* professional examinations, whereby failed candidates are enabled at frequent intervals to attempt to retrieve their failure, sometimes even by appearing for examination only the subjects they failed in.

We feel sure that this aspect of the question, in regard to professional examinations, has always been before the University, which, in the case of the medical candidates has already shown that it realises what six months of additional and avoidable waiting mean in the life of a candidate seeking entrance to the ranks of a crowded profession.

We recognise, further, that the financial side of the question *may* perhaps make it difficult at present, to hold more than one examination in Law in the course of a year, unless the fees for registration for the examinations are correspondingly raised. Should this prove an obstacle in the way of sanctioning additional half-yearly examinations for the F. L. and the B. L. candidates under the old regulations, we would suggest as a remedy that a reasonable enhancement of the examination fees might be made, and the additional examinations provided. We have no doubt that the Law students whom such enhancement might affect would prefer it to the obvious disadvantages which the present transitory arrangements would entail upon them.

In the light of the facts indicated above, we beg that the University authorities be pleased to arrange for additional half-yearly examinations for the F. L. and the B. L. candidates in the years 1916 and 1917.

We have the honour to be,
Sir,
Your most obedient servants,
E. J. JOHN,
President.

K. KOCHUKRISHNA MARAR,
K. G. SETHIA AIYER,
V. SUBBA AIYER,
T. S. SRINIVASA RAU,
P. A. SUBRAMANYA IYER,
V. B. SUNDARA RAO,
B. N. SARMA,
R. RAGHAVA MENON,
S. SRINIVASA SASTRI.

Trivandrum,
28-9-1915. }

The Law Memorialising Committee sent this to every Senator with a prayer that his support may be extended to it and we found a valiant and sturdy champion of our cause in the local Fellow of the University Mr. (now Rao Bahadur) K. V. Rangaswami Iyengar. He undertook cheerfully to labour for us in the Senate and what he did for us there had better be told by himself in a letter which I reproduce below. The memorial submitted to the Registrar by Mr. K. G. Seshia Aiyer and others fetched the following reply dated 1-10-1915:—

Sirs,

With reference to your letter of the 28th ultimo, I have the honour to inform you that the question of holding additional half-yearly examinations in Law (F.L. and B.L. under the old Regulations) is a matter that will be considered by the Senate at its meeting to be held on the 22nd instant.

I have the honour to be,
Sirs,
Your most obedient servant,
FRANCIS DEWSBURY,
Registrar.

On the eve of the Senate meeting, Mr. Rangaswami Iyengar wrote to me from Triplicane under date 23-10-28:—

"I have just seen your letter of the 19th. Since my arrival I have been continuously in the move to reduce the opposition against, and to secure support for, my proposals *re* the Law Examinations. I have conferred with the Vice-Chancellor and the Advocate-General on the subject and I expect to be able to receive to-day evening the support of Mr. Arthur Davis and Mr. Ramunni Menon also. I have also scored on a preliminary point by getting the Senate to agree to consider my proposals before Mr. Subrahmanya Aiyar's.

"If I do not succeed, it will not be for want of hard trying. If the motion is accepted, I shall send you a telegram as requested."

The Senate finally adopted a resolution—and that was only by a majority vote—in favour of the bi-annual examinations. Thus our labours were crowned with success. It meant, financially about Rs. 31 and odd which we had collected by way of subscriptions but the experience of it was beyond all money valuation. Who can ever forget Mr. E. J. John's kindness and help or Mr. K. V. Rangaswami Iyengar's silent work behind the scenes, or Mr. Corbett's influential support that helped comrades in Madras to give expression to an innocent prayer? The experience, however, wrought on me some deep and indelible impressions which I gave vent in a correspondence into which I fell, shortly after, with the late Dr. Sir S. Subrahmanya Aiyer, provoked to it by a speech of his—
"Esteemed Sir,

I am one of those many impressed by your remarkable speech at the meeting where Mr.

C. R. Reddy spoke the other day and I write to say what a profound pronouncement you have made especially with regard to the Indian Fellows in the Senate.

"This part of your speech has interested me very much for several reasons, and coming, as it does, so soon after the recent Senate meeting, I am sure I am not alone in being so interested. I recently had a great deal to do in connection with the half-yearly Law examination resolution which you might have noticed was one of the few successes which Indian Senators have been able to achieve at the recent session of the Senate.

"The stupid papers in Madras have not reported fully what happened in connection therewith or else I have no doubt your reference to the complete ineptitude of the Indian Fellows would be better appreciated.

"You will pardon me to explain briefly what happened in this matter.

"The agitation for half-yearly Law examinations began first among the graduate students, and a kind Indian Senator agreed to give notice of a resolution embodying the prayer. The agitation started fully prepared for a failure and I happened to be the Secretary of the Committee appointed for the purpose at a public meeting here, but the only chance of the resolution being passed in the Senate lay in the students' emphatic demand and unanimous cry for it.

"The Law students in Madras caught the agitation and a kind person in the Advocate-General lent them the weight of his influence. It was an innocent harmless request which at the worst meant no financial loss to the University. The agitation was carried on in a systematic, organised way, all the Senators being personally interviewed and their co-

operation earnestly prayed for. There was not another agitation of its kind in the annals of the University and we hoped to see the Senate unanimously pass the resolution, especially as most of the Fellows interviewed warmly expressed sympathy for the prayer. Luckily the Syndicate had not expressed against it and to judge of its attitude from what two of its members spoke in the Senate, it was at the utmost anxious to raise the admission fees for the examinations from Rs. 40 which was what the resolution proposed to Rs. 60. There was not a single opposition to the idea of the Law examinations coming off half-yearly. And what happened in the Senate? When it came to voting on the resolution we just scraped through by a majority of but seven votes!

"The papers have not reported this and the impression that they give is that the resolution was unanimously passed.

"Mr. K. V. Rangaswami Iyengar had another far-reaching resolution so full of possibilities for an ultimate Indian majority in the different faculties and it was lost by three or four votes, thanks to some Indian Fellows being *neutral*.

"But all this is not what I should mean to say in this letter. Is there no remedy for this sorry spectacle of Indian F. M. U.'s dividing amongst themselves and losing the little chance they have of shaping the courses of education in our University? May it not be that you can suggest a practical solution for the difficulty, better than a hopeless and despondent cry that you have raised for more self-government and better control of purse?

"It seems to my humble self that this question has been well started by you and under your auspices. I pray you find the answer to the problem.

"Fear of public opinion and criticism can well be trusted, if at all anything can be trusted, to bring home to the minds of some of our F. M. U.'s that personal angularities are not to be displayed in the Senate like that of our University which, to start with, is hopelessly European in composition. Supposing an Association of the Indian F. M. U.'s is started, the controlling Syndicate consisting of universally respected gentlemen like you, with a quarterly journal or monthly, purely devoted to the solution of the University questions, every Indian F. M. U. being sworn (1) to be a member of the Association and (2) to stand in the Senate voting as the majority in the Association decides on the different questions coming up for discussion—cannot some action of this kind bring about a better state of affairs than we are now having? People look to you not to leave the question alone of which you have struck the keynote in remarkable words. I have given a very vague scheme and I mean nothing more than that you should not stop with the despondent cry which you have rightly raised.

"Hoping to be pardoned for this letter from a stranger,

I am,
Yours very respectfully,
S. SRINIVASAN.

3-11-25.

To

Dr. Sir S. Subrahmaniya Aiyer,
Beach House,
Mylapore, Madras.

5-11-15.

"DEAR SIR,

"Yours of the 3rd instant came to hand duly.

"Something on the lines suggested by you would be a good beginning. That however is work for men with health and capacity which I now utterly lack.

Yours sincerely,
S. SUBRAMANIAM.

10-11-15.

To

Dr. Sir S. Subrahmaniya Aiyer.

"RESPECTED SIR,

"It encourages me to hear from you that something of the kind I have proposed would be a good beginning. It would have been more encouraging to hear that you can make a start in the matter perhaps on the condition necessary in the light of what you say about your health, that you may withdraw after seeing the matter in safe hands.

"I am sorry to hear that you lack the health and capacity but the vigour of intelligence is still there, I know, quite intact. And would you not give a little of it to this movement if you think it useful?

"There are, I think, two ways of dealing with the subject further—either immediately moot it in the papers and then form an Association of the Indian F. M. U.'s or, what seems to be better in either case, the opinions and the co-operation of the F. M. U.'s be first invited.

"I am particularly anxious that the movement, if it should be started at all, should not get into the hands of an oligarchy that does not command *universal* respect.

"In case the Association is first started, it seems to me all that should be done immediately is to decide roughly who shall form the Syndicate or the controlling body of the Association. With the rather poor sort of public life that Madras has, this guiding body cannot be more than half a dozen strong at

the most and I can think of only two others besides you, just now, who can easily take a place there, Justices Abdur Rahim and Seshagiri Iyer.

"I request that you may give the subject a little more attention—if you think it worthy enough of a strain on your health—and put it, if you like, into the hands of newspapers or Mr. Abdur Rahim. My name, however should not be published in the papers.

"It is a remark that I have heard that as Vice-Chancellor you could have done more than what you have done. I don't know what truth there is in this, being in fact ignorant when you were Vice-Chancellor at all, but I am perfectly sure that, as the originator of this Association, you would be laying the foundations of a mighty Indian unit in the Senate, to be utterly unlike what it is now, a chaotic, disorganised body incapable of joining together on any occasion."

S. SRINIVASAN.

Beach House,
Mylapore,
13-11-1915.

"DEAR SIR,

"Yours of the 10th instant came to my hands just now and I hasten to inform you it is quite out of my power to move in the matter. I am almost confined to my room and scarcely meet anyone who takes part in public affairs. I shall not attempt to defend myself against the remark that more might have been done during my Vice-Chancellorship, which by the by, lasted two months and was but a compliment to the Indian community, my appointment as such having been made as a stop gap during the absence of the late Chief Justice Sir Arnold White during his absence in Europe on account of the High Court vacation for the year."

Yours sincerely,
S. SUBRAMANIAM.

I dare say Sir S. Subrahmaniya Aiyer forgave me the language of the youthful enthusiast at which I must now blush.

THE EDUCATIONAL SYSTEM IN INDIA.

By Mr. SETU MADHAO RAO.

THAT the educational system prevailing in India at present is defective in the extreme and stands in need of a complete overhauling, nobody can deny. Surely there must be something radically wrong with a system which in spite of its working for more than sixty years, has succeeded in educating only six per cent. of the entire population.

Another standing fact which has developed out of this defective system is that higher education is much more in demand than the lower education. Comparing Bengal with England, both having a population of nearly five crores, we find that both have an equal number of students, namely, twenty-seven thousand; but the number of students taking full literary courses was ten times larger in Bengal than that of the United Kingdom. Similarly students in the higher classes were much more numerous than those taking primary education. We thus see a strange phenomenon; higher education among the bulk of the students and callous illiteracy among the people.

How has all this come about? The origin of this phenomenon lies in the policy pursued by the Government during the last one hundred years. It would be interesting to trace the origin and development of modern education in India.

The East India Company down to the time of Warren Hastings did not care for the education of the Indian. Warren Hastings, who was a genuine admirer of the laws and literature of India, formulated a policy of encouraging ancient learning and abstaining from interference in any way with the habits

and customs of the people by introducing Western culture.

Had the policy started by Warren Hastings continued, India could not have tasted the fruits of Western culture for a long time to come. But, as a matter of fact, India owes her "introduction to English literature not to the British Government but to Christian Missionaries."* Desirous of introducing religious teaching, they took to the task of educating the people. The institution started by William Carrey is a notable example of the zeal of the missionaries.

Strange though it may seem, the demand for education on Western lines came from the Indians themselves. Knowing that a study of Western education was necessary in order to understand the British people, the Indians headed by Raja Rammohan Roy, an enlightened Hindu, "who had found his own way to a remarkable mastery of Western culture"† impressed upon Lord Amherst the then Governor-General of India, the necessity of educating the Indians. Raja Rammohan Roy himself with David Hare, a trader of Calcutta, started the Hindu College. A few years later, Alexander Duff, a "Scottish scholar, missionary and statesman" laid the foundation of the Scottish Churches College.

All the while the Government remained entirely apathetic till the India Act of 1833. The appointment of Lord Macaulay as the Chairman of the Committee of Public Instruction marked an important period in the history of English education in India. His Minute of 1835 subsequently led the government of Lord William Bentinck to declare its policy of giving English education, and

* Fuller's Empire of India—page 178.

† The Sadler Commission Report—1916-18.

the abolition of Persian as the Court language a few years later gave a definite encouragement to English education. The Minute of Macaulay introduced English as the medium of instruction while it hoped that a time might come within the following few years when the vernacular languages would be so fully developed as to allow the transfer of the medium of instruction from English to them.

The great defect in the policy adopted was that no attention was given to primary education. This state of affairs continued till the Despatch of 1854 by Sir Charles Wood urged the creation of a Department of Public Instruction in every province and equal encouragement to all kinds of education. But literary education dominated all other education till by 1882. "The University degree had become the accepted object of ambition, the passport to distinction in the public services and in the learned professions."* The primary education was completely neglected.

A clear set-back was given to the policy outlined in the Despatch of 1854 by the Indian Universities Act of 1904 which introduced an official influence in the Universities and compelled all recognised schools to levy a minimum fee. Education was thus made more expensive.

In 1918 some encouragement was given to primary education but in the absence of adequate funds from the Government to meet the necessary expenses very little could be done by the local bodies. One great fact strikes us as we review the educational policy of England and it is this that the Secondary and University education have received more support from the public than the primary education. A substantial support of the State is

* The Report of the Commission of 1882.

absolutely necessary if primary education is to be made successful.

The total expenditure on primary education rose from Rs. 7,600,000 in 1882 to Rs. 50,900,000 in 1922. During the same period expenditure on Secondary education has risen almost to an equal amount in spite of the fact that the enrolment in primary schools has always been five times as large as in secondary schools.

According to Mr. Fuller, "The Indian finance has never provided an amount that was adequate for the support of this organisation (Primary education). The school accommodation has generally been squalid and cramped, and the teachers imperfectly trained and under-paid..... The popularity of the instruction has depended more upon the habits of the community than upon the expenditure of the State."

To quote Howell "Education in India was first ignored, then violently and successfully opposed, then conducted on a system now universally admitted erroneous and finally placed on its present footing."

To enumerate the defects of the present system we first of all find that the system is top-heavy, primary education having fallen in cold neglect.

The next difficulty lies with the Universities themselves. "The method of administration, the archaic system of annual or bi-annual examinations without any compartmental system, the non-residential and non-teaching character of the Universities are all out of date and require a thorough overhauling."*

The third defect is the over-centralisation. One instance is sufficient to show us the truth

* V. V. Oak : England's Education Policy, page 99.

of this statement. In Calcutta University alone there are twenty-seven thousand students while in England the same number of students are distributed in more than half a dozen Universities.

The next defect is a lack of technical training thus overcrowding the Arts Colleges. In 1918 there were 133 Arts Colleges with an attendance of fifty thousand students. The reason for unemployment is not far to seek. Devoid of any technical training, capable of doing very little work other than filling Government posts or becoming lawyers, it is no wonder that the unemployment problem is staring us in the face.

Another question on which opinion seems to be equally divided is concerning the efficacy of the English language as the medium of instruction. It is no doubt true that when the English education began, the vernaculars were imperfectly developed. Even the Macaulay Minute had foreseen a time when the vernaculars would become the media of instruction.

While admitting that a knowledge of English has opened the way to a knowledge of various sciences, and that the English education is largely responsible for the creation of political consciousness in India, we cannot but regret to see that the vernaculars are completely neglected. English occupies most of the time of the students both in colleges and in private. No attention is paid to vernaculars at all.

This necessity of concentration on English has led to the unfortunate neglect of the students' own language. It struck the members of the Calcutta University Commission who expressed the opinion that "there was something unsound in a system of educa-

tion which leaves a young man at the conclusion of his course unable to speak or write his mother-tongue fluently and correctly."

It was the opinion of Mr. Bibhuti Bhushan Datta that "the forcing of an alien language only serves to dry up at their very sources, the very fountain springs of national power and thus impoverishes the nation of the side of initiative and originality."

Now there are welcome signs of a growing demand for a progressive use of vernaculars as media of instruction. Indeed, the Commission of 1917 recognising that it was not possible, in the absence of adequate text-books in vernaculars for Universities recommended the use of the vernacular as a medium of instruction in secondary schools.

The Osmania University having Urdu as a medium of instruction is a notable example of a growing tendency towards the acceptance of vernaculars.

This then in brief is a review of the policy adopted by the Government of India. That the system is defective is accepted by the Indian public which has started many institutions, notable of which are the Gurukul of Hardwar, the Vishwabharati of Bolpur, and the Prem Mahavidyalaya of Brindaban. It is the duty of the Government to change its policy and introduce an educational policy which would destroy the appalling illiteracy that is prevailing in India—*Education*, Cawnpore, May 1929.

SOME IMPORTANT PRINCIPLES OF PHYSICAL EDUCATION.

By

Mr. F. WEBER, M.A., B.P.E.,

Director of Physical Education for India, Y.M.C.A.

PHYSICAL Education, like every well-established science or art, has certain more or less well defined laws of procedure, or principles. These are the rules of guidance for the Physical Educator. They keep him steered in his rightful course. They serve him as the compass serves the mariner.

In the brief intensive course of Physical Education for teachers recently held in Hyderabad, the principles under review were brought into focus for particular emphasis. Some of these principles are allowed to stand on their own face value, i.e., without any explanation; others are given some explanation; and others still are somewhat elaborated. They are offered below because it is hoped that they will be of some value to all and of considerable value to some.

1. The New Physical Education must fit the individual to the new age. Not muscular energy is needed but nervous energy; not muscular power but organic vigour.

2. The basic principle of life is movement. The complete cessation of movement is death. "Nature has no leaves for the loafers."

3. Function makes structure. Do, and you become.

4. Nature—Nurture. The seed and the soil. A 50-50 influence. The Eugenist for Nature; the Educationist for Nurture. The nature of the child is its total environment—home, parents, family members; the streets, playmates, society; school, associates, teachers. The implied principle here is, of the 50 p.c. nurture influence, the school gets but a small portion of the child's time and the Physical Educationist but a fraction of that, so that every minute of his time must be made most of to make his influence count.

5. Individual Differences. Each child is an entity in itself. Treat it psychologically as well as physically as best suits its progress.

6. Provide ample opportunity for expression of child nature, in a properly created atmosphere. The game, rightly directed, is the medium *par excellence*.

7. Respect the child's personality. This is as one having feelings, intellect, will. This attitude will result in building up rapport (harmony relation) between pupil and teacher like nothing else can. The teacher's attitude more than any other single factor determines what the child gets out of his class period.

8. Diagnosis and prescription of exercise. A cardinal principle in the teaching profession is "Explore before you teach." You cannot build properly until you have first determined the foundation. Likewise the medical practitioner explores or diagnoses his case before he prescribes the medicine for the remedy. Case diagnosis and the prescription of exercise in Physical Education, variously referred to as Medical Gymnastics, Individual Gymnastics, Corrective or Remedial Gymnastics, stand as a special category. It is a sound principle to diagnose every pupil before he is exercised.

9. Posture education for every pupil. We say, education, advisedly here, for posture is the result of mental influence just as much as it is the result of physical influence, except in the cases of the structurally deformed or the pathologically weak. A leading Educator said: "If we could teach our children to stand straight, sit straight, and walk straight, more than half the problem in Physical Education would be solved." But of paramount significance is this fact: child or adult will not be able to hold a good posture if the posture muscles are insufficiently developed. The basic need in such cases to rectify the condition obviously is the application of postural physical exercises. As an antidote and remedial measure for mal-posture, every growing child should spend a portion of

every 24 hours in some form of exercise, either specific postural (as the specially prescribed) or general postural (as in certain types of games, volley ball, for instance.)

10. Regularity. A devout man will tell you, Make your religious devotions as regular a feature in your life as the taking of food. So a Physical Educationist will tell you, Make the taking of exercise as regular a feature in your life as is your breathing.

11. Exercise for general effects. Exercise should result in general or all-round development and benefit rather than local, except as in special cases of prescribed exercises for the purpose of remedying a local structural or functional defect.

12. Teach such exercises as are interesting and within the capacity of every pupil in the class.

13. Exercises should be *sane* (appealing to common sense), *safe* (within limits of undue strain), *vigorous* (large energy requirement), *beneficial* (tending toward some specifically set objective).

14. To relieve blood congestion of the brain as a result of concentrated mental application ("student fog"), encourage such forms of activity as vigorously exercise the extremities and trunk (neck to hips). The groups of muscles of large dimension being located in these parts will, by being exercised, demand an increased supply of blood and a great deal of it from the vascular system, this re-establishing balance and thereby obviating the congestion of the brain.

15. Directed physical exercises should produce one or more of the following effects: Correction or Prevention of structural and functional defects; Acceleration of the activity of the Respiratory-Circulatory system; Recreational values (sheer enjoyment and good fun as expressed by pupil and child nature); Educational values (revealed by noted changes effected, physical and mental).

16. Everything considered, free-hand exercises of the calisthenic group are to be preferred to the

use of dumbbells and clubs. "Your body your own gymnasium."

17. If stationary gymnastic apparatus is to be used, it should be used as an object to get over and around rather than on which to perform sustained and prolonged exercises.

18. Avoid exercises which give undue strain. Pain and strain are not necessary concomitants to sound Physical Education. Especially to be avoided in exercises are static positions of the cramped thorax (neck to diaphragm). "Physical straining is not physical training."

19. Avoid exclusive specialisation for the purpose of building up bulky muscles. "All muscle and no heart and lungs" supplies quantity but not quality. Life is quality, and arises out of organic functioning. Vital capacity, or health, is not mass but function.

20. Exercises should not violate the basic organic functions of the Respiratory, Circulatory, Nervous, or Nutritional systems.

21. Principle of Progression. Exercises should be arranged, whether in a drill, class period or season's programme, according to the principle of progression. That is from the simple to the complex; from little energy requirement to greater energy requirement; from less skill requirement to increased skill requirement.

22. Order of exercises in the calisthenic drill. From arms to legs, to trunk, to combination exercises. That is, arms are exercised first, then the legs, and then the trunk, and finally combination exercises of arms and legs, arms and trunk, legs and trunk, or all three (arms, legs, trunk) exercised simultaneously. This arrangement builds up a graduated dosage. The arrangement is sometimes referred to as the Concentric system.

23. Teach such exercises and forms of recreation as can be conveniently carried on, and spontaneously entered into, after school hours, and after school days are ended. Emphasis on exercises which can be done independent of gymnastic

apparatus and equipment. Build play and games' habits and attitudes in such a way that those habits and attitudes in and toward play and games will carry on throughout life, and not cease with the end of school days. The development of a high degree of skill in any physical activity tends to perpetuate that activity in the life of the individual. Therefore encourage the development of increased skill in all physical activities.

24. Forms of physical activity having a natural foundation (evolutionary basis) prove to contribute the most value, psychologically as well as physiologically to the normal individual. Running, leaping, throwing, striking, kicking, hanging are such forms. In man's primitive life of "eat or be eaten," these forms of physical activity provided the means of his escape from the enemy as well as brought him his food. Because his very life was dependent upon his success or failure in these activities, they and he developed or evolved concurrently; because of their high utilitarian value their use was required more and more and he became increasingly expert in their usefulness. With each succeeding success it is safe to assume that he derived great satisfaction from their use. Hence the philosophical explanation, or speculation, for the reason of the mental satisfaction and physiological benefit from such activities among us in this day. "The ancestral influence is engraven upon our nervous system."

25. Corrective and Preventive forms of exercise, in the form of calisthenic or posture exercises, are "artificial," in the light of the substance given in the explanation of the previous principle. The principle established under this head, however, is that an "artificial" means is utilised to counteract an artificial situation, or condition of life, a sedentary type of living with but a minimum degree of vigorous physical activity, such as was essential with our primitive ancestry.

26. Body-mind relationship factor. The brain, a physical organ, part and parcel of the physical

body, is the instrument of the mind. When the brain is in good order the mind is good, intelligent, efficient. The brain depends for its best functioning upon the general condition and tone of the physical body.

27. Educational factor. Scientific education of the mentally retarded children proceeds through the muscular-nervous channel. Doing things physically is the basis of mental education.

28. "Morals are caught, not taught." Physical Educators, as a body, are agreed that there is nothing more significant for the development of sound morals in a boy than the life of a good man, as an example or model, much of whose life is lived before the boy. For that reason, Physical Education as a profession looks to the man's morals, who is to stand before impressionistic young lives, as the first requisite of fitness for the teacher in this calling.

29. Character values from the team games. The opportunities provided by the team game, where judgment and activity responses have to be made to a variety of quickly arising situations of importance, afford a most fertile sphere of character development under proper leadership. "Playing the Game" has become an adage in the English vocabulary of everyday usage and conveys the specific idea of right conduct, or, socially acceptable response by the respondent in any given social situation, which calls for judgment or action. "Playing Cricket" connotes the same idea, incidentally reflecting the long recognised inherent possibilities of the team game for developing right behaviour in social life.

30. Leadership essential to insure socially useful values resulting from play and games. Not all instincts or inner urges, as such, are wholesome. For that reason the question of capable leadership for boys is imperative. The leader is responsible for the satisfaction and annoyance that result from the programme of physical activities. All socially useful values should be conserved. "Games without capable leadership can be socially destructive, games with capable leadership are socially constructive." The principle here is that capable leadership is essential.—*The Hyderabad Teacher*: April, 1929.

Reviews and Notices.

THE PALLAVAS OF KANCHI—THE MADRAS UNIVERSITY HISTORICAL SERIES III.—BY R. GOPALAN, M.A., SUB-LIBRARIAN, CONNEMARA PUBLIC LIBRARY, MADRAS, AND SOMETIME UNIVERSITY RESEARCH STUDENT. EDITED BY DR. S. KRISHNASWAMY AYYANGAR, UNIVERSITY PROFESSOR OF INDIAN HISTORY AND ARCHAEOLOGY. Pp. xxxiii + 245. 10 CHAPTERS AND APPENDICES A, B & C. ADDITIONAL NOTES BY THE EDITOR, TWO PORTRAITS, A MAP AND INDEX. Price Rs. 5.

The book under review is a valuable addition to the library of Indian History. It is in the main a useful summary of the available facts about the history of the Pallavas. In presenting this account, the author does not omit to state the views and theories of scholars who have worked in this field. The Introduction contributed by the editor, covering about 25 pages, attempts to indicate the outstanding problems of Pallava history lightly touched by the author himself, such as the possible origin of the earliest Pallavas of the Prakrit Records (C. 250 A.D. to 350) out of the Southern Viceroyalty of the Satavahanas, the Pallava alliance with the Chutu Nagas, the significance of the Kalabhra interregnum in elucidating the origin of the Pallavas and the significance of the fresh details disclosed by the newly-published Vaikunthaperumal Temple epigraphs about the 'usurpation' of Nandivarman Pallavamalla. In the introductory chapter of the book proper, the author tells us the story of the re-discovery made of the Pallavas by the labours of archaeology along with some account of the available sources. The discussion of the theories as to the origin of the Pallavas, however, in Chapter II does not arrive at any conclusion. The author is satisfied with a criticism of the various views put forward by different scholars. The sketch of the origin of Kanchi in the same chapter is meagre. If archaeological exploration would be fruitful in any locality of South India, it is undoubtedly Conjeeveram, and we may some day

hope that the buried treasures of this hoary city would lighten up many of the obscurities of the Pallava as of other periods. A topographical sketch of the city and environs, therefore, would have added much to the value of the book. In Chapter III we get a plain account of the earliest Pallavas of the Prakrit Records (C. 250—350), but in Chapter IV the subject-matter becomes intricate in the effort to unravel the tangled skein of the royal names of several generations disclosed by Sanskrit Records (C. 350—550) Mr. Gopalan's account does not bring us any the nearer to certainty or order. Chapter V gives a brief sketch of the dynasties of the outlying regions—the Vishnukundins, Kadambas, Salankhāyanas, etc. Chapter VI unfolds the Pallava ascendancy under Simhavishnu and his successors. The interesting discovery of the portrait-images of Simhavishnu, Mahendravarman and others is referred to. Chapter VII describes the great king Narasimhavarman. The author makes ample justice to the story of the Ceylonese prince who befriended Narasimha and sought his aid, so vividly described in the *Mahavamsa*. The whole of the chapter from the above chronicle is extracted and given as an appendix to the book. The Chapters VIII and IX narrate the last phases of Pallava history—the dynastic revolution which brought Pallavamalla to the throne, his long reign, and the rule of his successors (the so-called Ganga-Pallavas) till the Pallava ascendancy ceases as the result of the rise of the Pandyas and Cholas. The last chapter is also very interesting, being a summary of the facts about Pallava administration and the religious and social history of the period. One would wish this account to be much longer and fuller.

The inscriptions which form the source of information are arranged chronologically in Appendix A, but without any indication of dates. There are some important omissions in the bibliography, which, to say the least, is very strange.

As usual with the Madras University publications, the print and get-up of the book maintain a high standard.

THE ANNALS OF THE BHANDARKAR ORIENTAL RESEARCH INSTITUTE, POONA VOL. IX, PARTS II—IV.

This rather unusually bulky number is interesting and varied in its contents. The Rev. H. Heras, S. J., of Bombay, discusses the problem of Kāca, whose name is borne by a number of small coins which are unanimously agreed to belong to the early Gupta dynasty. He infers from a fact generally overlooked in the famous Allahabad Pillar Inscription of Samudra Gupta, that there was a rebellion of the king's brothers against him in the beginning of the reign, and that the eldest among them who was possibly Kāca was enthroned and accordingly coins were issued in his name. The second point that the writer tries to elucidate in his article is that Samudra Gupta must have waged in Aryavarta two distinct campaigns, the first of them being mainly a suppression of the rebellion of two kings and the second, narrated in the *prasasti* after the southern campaign being the suppression of a number of rulers who were violently exterminated.

The next article is a continuation by Mr. Sukumar Sen of his study of the use of the cases in Vedic prose. Mr. D. B. Diskalkar of Rajkot gives the substance of several inscriptions, hitherto unpublished, regarding Vatupala who was the Cambay viceroy of the Vaghela King Bhima II of Anhilvada and who was a great patron of Jainism. The first of these inscriptions gives a detailed genealogy of Vastupala's family, the second likens him to Kautalya in point of intellect. Professor V. K. Rajvade continues his scholarly examination of words in the Rig-Veda.

Rai Bahadur Hira Lal of Jubbulpore maintains in the course of a learned article that the Kalachuris did really found the era associated with their name and the records show that they were identical with the Traikutakas. The dynasty should have existed even before the era started and might have originated in a defection of the Mandhata Haihayas.

The writer traces the kings of Tripura down to the close of the 12th century A. D. when they declined.

The number contains a learned instalment by E. P. Horowitz of 21 specimen words taken from the Semantic Dictionary on which he has been engaged for several years, with a view to excite the interest of scholars in Sanskrit Semantics. Mr. M. G. Inamdar of Nagpur explains Bhaskara's method of working out irregular quadrilaterals with commensurable elements. Among miscellaneous contributions are notices of the life and time of Madhusudan Sarasvati, the Bengali commentator of *Harahila*, by several conflicting critics—and a note which tries to explain that the dramas of Bhasa should have existed before the beginning of the 5th century. There is also a useful obituary notice of R. Von Garbe who was a most competent Western exponent of Sankhya philosophy.

A HISTORY OF THE BRITISH COLONIES, BY H. L. JONES AND C. SHERRATT. 2ND EDITION. (LONDON, UNIVERSITY TUTORIAL PRESS LTD., 1928). Pp. xii AND 195. Price 3s. 6d.

This book, which has been brought up-to-date, viz., the Imperial Conference of 1926 and the opening of the Australian Commonwealth House at Canberra in 1927, traces in brief outline first the growth of the British command of the seas, the advance of the spirit of discovery and the resultant enterprises of pioneer adventurers, buccaneers, trading-companies and colonists whose emigration did not commence on a large scale till after the Napoleonic wars. The various phases of the struggles for empire, first against Spain, then against the Dutch and the French and in India, are next described. Then follow outlines of the growth and consolidation of British dominion in Canada, Australasia, Africa, etc., and of the establishment of power in the various outposts—all making up between them the British Commonwealth. The different phases of Imperialism through which

England has passed, leading up to the ideal of Imperial Federation are the last subjects to be dealt with. The narrative is plain and not overburdened with matter and emphasises, as the foreword shows, four main principles; viz., the influence of geographical conditions on expansion, the importance of the command of the seas, the value of individual enterprise and the gradual growth of an Imperial consciousness. The book can well serve as a good supplement to the ordinary text-book of English history in which the arrangement is chronological.

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Elton : Animal Ecology.

L. Medicine.

Charakasambhitam, with a comm. "Vachaspathyam."

Varier : Vishuchika.

Govinda Menon : Soundarya Arogya Jeevitho-payangal.

Krishna Varier : Arya Vaidhya Charitram.

N. Fine Arts.

Hurlimann : Indien, illust.

Rahman Chughta : Muraqqa-i-chughtai.

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Van de Wall : Utilization of music in prisons and mental hospitals.

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O. Literature.

MacNicol : Poems by Indian women.

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Modern miscellany—coll. of essays.

Gardiner : Leaves in the wind.

——— : Pebbles on the shore.

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——— : Many furrows.

Graves : Mrs. Fisher or the future of humour.

Adhyatma Ramayanam.

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——— : Samrajya Gita.

Bhas : Madhyamavyagagam.

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Vasudeva Sarma : Susrusambhita.

Kalidasa : Vikramorvasiyam, tr.

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Krishna Varier : Veera Vinodham.

——— : Palavaka Kavithakal.

Kumaran : Vidhiyodu Poruthiya dheera makkal.

Kunhi Kutton Thamburan : Ascharya Chudamani ; Kamsan ; Kavi Bharatham ; Sankaracharya Charitam ; Thuppalkolambi.

Kunhan Varier : Jananakopadesam.

Narayana Menon : Kathayulla Kathagal.

Rama Krishna Pillai : Poura Vidhyabhyasam.

Madhavikutti.

Narayana Menon (N.) : Narayana Menon (V.)

Nair : Purana Kavyamanjari.

Narayana Bhattatbiri : Rajasooyam.

Narayana Iyer : Kalyani Kutty.

——— : Nandan Charitram.

Narayana Menon : Vasudevan Nambudripad.

P. Philology.

Molesworth : Eng. and Marathi dict.

Q. Religion.

Wijeyesekera : Self discipline and purity.

Bhagavatam, called Balaprobodhini.

Bhavishya Maha puranam.

Brahma Vaivartham Maha puranam.

Brahmanda Maha puranam.

- Markandeya puranam.
Linga Mahapuranam.
Garuda Maha puranam.
Kalikapuranam.
Devi Bhagavatam.
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Sastry : From a rural school window.
Handbook of Indian Universities, 1928.
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McLean : That Mexican!

W. Politics.

- Laaki : Communism.
Marriot : Mechanism of the mod. State.
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The Educational Review.

Speaking before the recent Missionary Conference held at Kodaikanal, Dr. A. S. Woodburne presented a very interesting analysis of the budget figures of the Madras Government regarding education. The total provision for education from public funds in the budget for the current year amounts to three crores and ten lakhs of rupees, or 18% of the total revenue. The expenditure on University education for the current year amounts to Rs. 31 lakhs, while it was less than half the sum in the year 1923-24. There has been similar increase in the expenditure on Secondary and Elementary education. The figures for 1923-24 were 19 and 75 lakhs of rupees respectively, while they are 23 and 142 lakhs of rupees to-day. Compared with other provinces and past years, this is of course a creditable record, but there is unfortunately considerable headway to be made yet, if Madras is to rank with Japan, or the civilised countries of the West, regarding the percentage of literacy. We hope the Government of Madras will not rest content with these achievements, but will put forth further exertion, especially as certain other Presidencies, particularly the Punjab, are forging ahead.

The Government of India cannot usually be said to be particularly generous in its appreciation of educational and literary work in its periodical

Honours Lists. We are therefore glad to find that in the recent Honours List two educationists have received the distinction of a Knighthood. Prof. Jadunath Sarkar has a distinguished record not only as an Historian and research scholar, but also as an educationist and has therefore deserved the Knighthood in every way. His work as the Vice-Chancellor of the University of Calcutta under very adverse circumstances deserved at least this recognition. Prof. C. V. Raman, F. R. S., is also another excellent choice for this distinction being easily among the foremost men of science in India, with a reputation which is by no means confined to these shores. Prof. Raman combines deep scholarship with bright emotion and is a happy combination of the somewhat conflicting virtues of soundness and enthusiasm. We hope the Government of India will show similar wisdom in succeeding Honours Lists.

His Excellency the Viceroy has accepted the invitation of the Inter-University Board, India, to open the Second Universities' Conference which is to meet at Delhi on the 30th October and the following days. It was in May 1924, that Lord Reading opened the First Universities' Conference at Simla, one result of which was the formation of the Inter-University Board, to serve as a permanent organisation to take joint action on behalf of the Universities in India. The work of the Inter-University Board for the last five years has been before the

public and undoubtedly testifies to the wisdom of those who have set up the organisation. The Universities' Conference will mark an important stage in the development of education in this country and will, we have no doubt, be full of beneficial results. Among the subjects which will come up for discussion before the Universities' Conference are Physical and Military Training of Students; Co-ordination of Research in the country; Relation of Intermediate to University education and so on. The Conference will consist of three representatives from each of the eighteen Universities of India and a discussion of such subjects by distinguished experts from different parts of the country is bound to be of the greatest utility.

The retired members of the Indian Civil Service have often utilised their years of pension in England, to strengthen the hands of reactionaries who work against the political advancement of India. We must now add a retired member of the Indian Educational Service to that list—Mr. Arthur Mayhew—whose recent book on *Christianity and the Government of India* is a subtle piece of political propaganda against this country. We are familiar already with those who wish to preserve the "British character" of the Indian administration and who talk of the essential British 'steel-frame' for the future of this country. Mr. Mayhew has made the astonishing discovery that the Government of India has been parti-

cularly Christian and he trembles to think of the serious consequences which will follow the transference of power into the hands of the Indians! The Christian spirit, it would appear, will vanish and the happiness of the three hundred millions of this unfortunate land would be in jeopardy. This is no place to enter into a detailed examination of these fallacies, but anybody must be fearfully ignorant indeed of the details of British Indian history, if he could be so foolish as to think that Clive, Hastings and other empire-builders were actuated by the Christian spirit. There could be no worse travesty of Christ and Christianity than to talk of the Christian spirit of these adventurers. If the Government of India was actuated by anything of the true Christian spirit, of its kindness, fairplay and justice, there would not have been any political agitation in this country and the people should have been more than content to be ruled by the meek representatives of Jesus of Nazareth. The main complaint against the Government of India is, on the other hand, that it is not Christian! May we invite the attention of the Government of India to this new advocate of the need for British supremacy in India and recommend that he should not be allowed to rust in his retirement, but his services should be utilised in the Council of the Secretary of State for India? He should form an admirable member of that reactionary gang of retired Anglo-Indian pensioners.

Education figured prominently in the discussions before the current session of the U. P. Council. Legislative Council of the United Provinces. It was resolved that a Committee should be appointed to recommend the steps necessary for the wiping off of illiteracy from the United Provinces within a limited period. The United Provinces are almost at the bottom of the Presidencies in India with regard to literacy, as also with regard to the percentage of pupils undergoing instruction. As was explained by more than one member, on the official as well as on the non-official side, the spread of elementary education is almost entirely a question of money, but we hope the recommendations of the Commission will enable the Provinces to take stock of their present position and the work still lying before them. Another useful resolution related to female education and recommended that there should be at least one Anglo-Vernacular Middle School at every District head-quarters. It transpired in the course of the discussion on this resolution that there were as many as twenty-four districts in the United Provinces which did not have even a single Middle School for girls! This is a state of affairs not at all creditable to the Provinces and we hope that early steps will be taken to set it right.

The proceedings of the recent Conference of the Canadian National Council of Education held at Vancouver concentrated attention on Education

and World-Peace. It is getting to be more and more recognised by the statesmen of the world, that if International Peace is ever to dawn upon this earth, it must be the result not merely of the work of diplomats, but also of educationists. The message of World-Peace must rest on the solid foundations of education and every pupil at school and student at college must have the opportunity of learning the message as early as possible in life:

"While I sincerely appreciate the official efforts of countries and statesmen through peace pacts and other agencies for international co-operation, I say quite frankly, that in my opinion, we shall get nearer that will for peace, which we all desire, through meetings of this sort," said Viscount Willingdon, Governor-General of Canada, in his inaugural address. "Unofficial in character as they are, these meetings afford an opportunity for the peoples themselves to get together in all parts of the world, and in friendly ways to discuss their common objects and their common interests, coming to know each other more and to understand each other better."

"Modern natural science is reducing distance, and I hope that the future will see people individually making more effort to go about for themselves and to see the people of other countries. I hope with all my heart that the result of the discussions at this Conference will be to bring us one step nearer the goal for which we are all working, the peace and good-will of the nations of the world."

Dr. Rabindranath Tagore who was among the principal guests on the occasion also spoke in the same strain. We are glad to find that the subject is also coming up before the next Conference of World-Education to be held in Geneva about the end of July.

It is hardly necessary to mention that in many ways Travancore is more advanced than the rest of India in

Education in Travancore.

matters relating to education. The latest report on Education in the State issued by the Director of Public Instruction, Rao Bahadur K. V. Rangaswami Iyengar, contains some interesting facts worthy of wider notice. The widespread literacy in the State is not due entirely to its traditions of culture and some of the peculiarities of the social system, but to active co-operation by the authorities of the State. So early as in 1817, Rani Gouri Parvathi Bai enunciated the sound principle of State-policy that "the State should defray the entire cost of the education of its people, in order that there might be no backwardness in the spread of enlightenment among them, that by diffusion of education they might become better subjects and better public servants and that the reputation of the State may be advanced thereby." The percentage of literacy is 44 for men and 16 for women against 17 and 2 for the whole of India. Taking the usual calculation that the percentage of school-going population is 15, about 78% of the children were actually undergoing instruction, but the Director of Public Instruction is inclined to question the accuracy of this scale and is of opinion that almost every boy and girl of school-going age is actually undergoing instruction. We congratulate Rao Bahadur K. V. Rangaswami Iyengar on the production of this excellent report and on the solid record of work lying behind it.

An important step in the advancement of agriculture in this country is the recent inauguration, on the

Agricultural Research.

recommendation of the Royal Commission on Agriculture, of the Imperial Council of Agricultural Research. The constitution is fairly representative and it is hoped the Council will be able to administer wisely the large funds which will be placed at its disposal from time to time. The Government of India have always had a knack for the creation of additional posts for the so-called European 'experts' who are to advance research in the country and have followed the usual tradition now also in getting two highly-paid European experts attached to this body also. We are not at all inclined to believe that suitable Indians were not available for the places. We hope however that the appointment of these Europeans will only be a temporary affair and they will be replaced by Indians as soon as their periods of office will expire. Efforts must be made even from now to train suitable Indians for the places, if India is to benefit by the large amount of expenditure which is to be incurred over this Agricultural Council. The foreigner is not very much interested in the life of the country and the valuable experience he acquires at such terrible expense to the tax-payer is also unfortunately lost to the country, when he retires after his service to make his home elsewhere. Indianisation is the remedy for this as well as for many other evils in the country.

Now that the Labour Party is in power, it will interest our readers to know that the following items of educational programme have been put before it by the *Educational Worker*, the monthly organ of the Teachers' Labour League of England :—

1. The provision of open-air nursery schools, especially in all over-crowded areas.

2. The further development of the school medical service, and the establishment of the necessary number of special schools for physically and mentally defective children.

3. The reduction in the size of classes in primary schools to a maximum of forty, and,

as soon as circumstances allow, to a maximum of thirty.

4. The staffing and equipment of primary schools on the same scale as that of secondary.

5. The provision of varying types of secondary education for all children of eleven.

6. The extension of the school-leaving age to fifteen, with a view to its being raised to sixteen, and the necessary provision of maintenance allowances.

7. The creation of a democratic system of education, adequately financed, free from the taint of class distinctions, and organised as a continuous whole from the Nursery School to the University.

Some of the items are undoubtedly of interest to people in India also.

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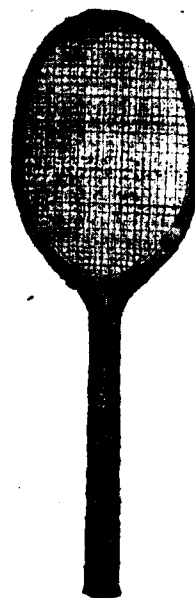
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Many teachers have adopted as a class-book Principal Martin's "English Dialogues," and yet there are some who, while they appreciate the merits of the book, still hesitate to use it lest their boys should cram some of the dialogues. The fear, of course, is groundless; but, in any case, they need not worry about this, for even if a few boys display so much zeal as to learn by heart even half a dozen dialogues, no harm is likely to result therefrom. This is, however, by the way.

For the present, our object is to direct the attention of all teachers to the varied uses to which Martin's "English Dialogues" can be put.

(1) ESSAY-WRITING.

The boys may be asked to read at home certain dialogues—those containing pros and cons—and next day may be asked to write an essay on a subject discussed in one of these dialogues.

(2) LETTER-WRITING.

The boys may be asked to read at home four or five dialogues selected by the teacher, and may then be asked some days afterwards to write a letter on a subject having some sort of relation to the subjects of these particular dialogues.

(3) SUMMARIZING.

The boys may be asked to summarize a dialogue suitable for the purpose.

(4) STORY-WRITING.

The boys may be asked to narrate in their own words a fable or story told in the form of a dialogue, after having it read once in the class.

(5) DIRECT-INDIRECT.

Some of the dialogues may be utilised for exercise in Indirect Narration.

(6) IMAGINARY DIALOGUES.

Two boys may be asked to read a dialogue in the class, each boy reading the part assigned to him. Then any other two boys may be asked to carry on conversation on the same subject, the teacher encouraging them to use their own words and ideas. After this preliminary exercise, the class may be asked to write a dialogue on the same subject. The result will be found encouraging both to the boys and the teacher.

And all that is said above illustrates the importance of method in the class-room, for no matter how good a text-book may be, half its worth is lost if it is not used in the right way.

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204, the sentence: 'I saw my old teacher who invited me to dinner' is rightly put down as compound
and not complex; for 'who' here means 'and he'. Again on page 128, in the sentence: 'A man was
sent who was to deliver the message', the clause beginning with 'who' is described as an adverbial
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but it could not be found. This is the great defect of the book. In about 300 pages the authors have
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The Madras Mail, Friday, October 31, 1924:

Books which deal with the problems of educational psychology from the Indian point of view are too few and we, therefore, welcome most cordially one which makes such a study and makes it well. Miss Gordon's contribution to this field is one which ought to be read carefully and digested thoroughly by all those who have to do with the education of children, whether teachers or parents.

The value of Child Study is first twofold, from the point of view of theoretical psychology, and second of education. Education along with psychology has much to learn from the science of biology which suggests to both of these sciences the unit for study, viz., a reaction which is a response to a stimulus. The mental life ought to be viewed as is the physical from this point of view. Further, biological science is showing the usefulness both as to method and content of the observation of development. The study of child-nature is in accord with the genetic method which characterises all the biological sciences. Educationally we have more to do with children than with adults in our schools and so from the practical point of view also the more that we can learn about the natures of educands the better for our work. Miss Gordon's book is thus a real contribution to our literature, for it considers these questions with special reference to conditions in South India.

One of the most important of modern developments in this science is that made through the observation of individual differences. Although education is a social process and children are social in nature, yet we cannot deal with them too much in groups without doing great injustice to matters in which they are unlike. Studies made in Europe and America have their value for Indian teachers, but observations made in India, as Miss Gordon's have been, are of great value in enabling us to ascertain the similarities and differences with children of other countries, and the differences among groups and individuals here. Miss Gordon has not only given the result of her own observations but—what is even more important—she has shown teachers and others how they may observe for themselves.

The book surveys the more important problems connected with the study of child-nature. It deals with the stage of child development, with the processes of sense-perception, with play, hand-work, and fatigue, with exceptional children, both sub-normal and supra-normal, with measurements of intelligence, and with the application of the Kindergarten system to the Indian system. It is one of the books which the Academic Council on the recommendation of the Board of Studies in Teaching has declared as suitable for candidates for the L. T. degree. We hope that it may have a wide circulation as its influence is sure to be for good.

Education (Allahabad), March 1925.

The distinguished author of the book under review is one of the few enthusiasts in India who have taken to a systematic study of child-nature. The book embodies the results of close study by the author, not merely of the existing literature on the subject, but of the actual, mental and physical growths of children, as witnessed by her in several schools in Britain and India where she has had the opportunity to work. Within a brief space of 200 pages, the author has contrived, in her plain, matter of fact, and at the same time, engaging style, to elucidate the various topics connected with child life such as the sense perception, play, the service of Hand in Mental Development, fatigue, exceptional children, measurement of intelligence and the Kindergarten system; touching the various theories on these topics and supplementing them by her own views based on personal study and investigation. We would especially commend to our readers the beautiful and inspiring chapter on the Kindergarten system in which without going into technical detail, the author has surveyed the basic principles of the system and pleaded in accordance with these principles for the Indianisation of Indian education. We are sure that this

little book will prove an excellent handbook for teachers as well as parents and others interested in the subject and kindle in them a deeper interest therein. It has been already recommended by the Academic Council of the Madras University as a suitable text-book for the students appearing for the L. T. Examination and we hope that other Universities will soon follow suit. We congratulate both the author and the publishers on this valuable publication and recommend every teacher to secure a copy thereof.

The Madras Christian College Magazine, January 1925.

The study of child-nature is exceedingly important for both of the sciences of Psychology and Education. Its importance for Psychology is from the genetic point of view. In the child one is able to observe in simpler forms many of the processes at work which in adult experience become so complex as to make them difficult of analysis. Its importance for Education is too obvious to need extended notice, and yet there are some who are so short-sighted as to neglect it. Here in South India there are a great number of schools in charge of teachers who do not know the elementary facts about child-nature. But with the progress of education the time will surely come when it will be considered as dangerous to employ a teacher who is ignorant of child-nature as it is to employ a man for a physician who knows nothing of anatomy and physiology. Such a book as that which Miss Gordon has written will serve a useful purpose in hastening that day by putting teachers in possession of a primer which contains the fundamentals of the subject in a readable style. It is the type of book which we would like to see translated into our South Indian vernaculars, because it not only includes the principles of the science, but states them with special reference to the needs of Indian teachers.

A personality is the outcome of forces which are both hereditary and environmental so that child study must take account of both sets of factors. Much more is to be gained by teachers through the study of children for themselves than the mere perusal of books on the subject, however authoritative they may be. The trouble with so many students of other things as well as of child-nature is the evident desire to be spoon-fed. They desire to get their information at second-hand rather than take the trouble to study for themselves. In many instances teachers have not the technique necessary to observe intelligently. Very valuable, then, is Miss Gordon's chapter on 'How to Study a Child,' particularly for those who are beginners in child study, and it is a matter of vital concern as much for the parent as for the teacher.

Certain subjects have been especially studied recently by educationists, and Miss Gordon gives useful accounts of the results of these studies. One chapter is devoted to the place of play in child life and in the educative process. It is a wholesome corrective for the old fashioned idea that play is a superfluity. The author brings out some of the most useful services which are rendered by play, for play has direct educative value, assisting in the training of the judging and other mental processes, as well as in the spirit of fair-play and other moral qualities. The play-ground affords a splendid type of voluntary democratic organisation. Another chapter is devoted to 'The Services of the Hand in Mental Development.' Sometimes the school in emphasising the development of the mental processes has tended to neglect the fact that intelligence is sometimes motor, and that these two factors, the mental and motor, are closely related to one another. The questions of 'Exceptional Children' and 'The Measurement of Intelligence' are closely related, since it is through the latter that we get our most accurate knowledge of the former. A final chapter deals with a question on which Miss Gordon is surely competent to speak, 'The Kindergarten System and Its Application to Indian Children.' Altogether she has succeeded in writing a most useful little book, and we hope that it may have a good circulation among teachers and parents who cannot but profit by what she has written on the nature of children and how they should be educated.

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In fine, this book bids fair to become easily a popular rival to the many books on Geometry now in the market—almost all of which are either American or English publications. We have real pleasure in wishing for this book an honoured place among the text-books now in use.

The Ernakulam College Magazine:—The author must be congratulated on the publication of this book which is indeed a very welcome addition to the existing books on the subject. It is intended for the student of the High School classes, though we would like every College student to go through it to get acquainted with the broad principles and the historical background of the subject. The method of treatment adopted will be much liked by students who will find the study of the subject quite a pleasant one. The work of the teacher is considerably lightened by the inclusion of interesting details which he may find difficult to get access to otherwise. The logical arrangement of the main propositions, the emphasis on practical applications and correlation to problems of every-day life, the human appeal to the pupil by means of historical notes and sketches and the very numerous sets of graded examples, are a few of the many interesting features of the book. We await with great interest the remaining parts of this book, dealing with Areas, Circles and similar Figures, which, we feel confident, will be on the same high level of treatment, quite in fitting with the long experience of the author as a teacher of Mathematics. We would however suggest that all the parts may be bound in one volume and published at a reasonable price.

Rao Bahadur P. V. SESHU AIYAR, I.E.S. (Retired), formerly Professor of Applied Mathematics, Presidency College, Madras, writes under date 10-3-1929:—A New Geometry for High Schools by Mr. A. A. Krishnaswami Aiyangar, M.A., L.T., is a book prepared to meet the special needs of the Indian High Schools. It follows closely the Madras S.S.L.C. Syllabus in Geometry for Group C and gives many exercises, practical, theoretical and numerical. One distinguishing feature of the book, not found in other books, is the historical and critical note added to many of the propositions. This relieves the student from the monotony of abstract reasoning, makes an effective human appeal to him and adds a life to the methods of teaching. His critical notes on 'superposition', 'parallel postulate', principle of duality, etc., are simply splendid and are likely to induce the advanced student to read more of rational and modern geometry. The book on the whole is well-conceived and written on most up-to-date lines and deserves to be used as a text-book in our High Schools in preference to other books in the field.

Mr. S. BALAKRISHNA AIYAR, B.A., L.T., Lecturer in Mathematics Teachers' College, Saidapet, writes under date 12-3-1929:—Dr. Vaidyanathaswami, M.A., F.R.S.E., of the University of Madras, has written the Foreword to Mr. A. A. Krishnaswami Aiyangar's book, "A New Geometry for High Schools." This ought to be a sufficient recommendation for the book being largely resorted to by teachers and students of the subject. The treatment followed appears to me to be on novel lines, following a kind of compromise between the Euclidean sequence and the re-adjustment found in the more modern text-books. The abundance of notes, historical, philosophical and critical, should be attractive to the teacher and the interesting variety of exercises useful to the learner. I am awaiting with interest the appearance of the other three books.

The Mysore University Magazine, March 1929:—At the present-day methods of teaching elementary mathematics, particularly elementary geometry, are in the melting pot. The more theoretically-minded persons require for instance, discussion of the foundations underlying geometry, examination of the purely logical aspects, inquiry of the sequence or rational ordering of the subject matter, etc. Others desire "experimental evolution," "critical and anecdotal information," "permanent cultural and practical instruction," etc. In this book, it may be said that a judicious combination of both these has been attempted, and this tempts us to look forward to the rest of his series, of which, we are told, this is the first.

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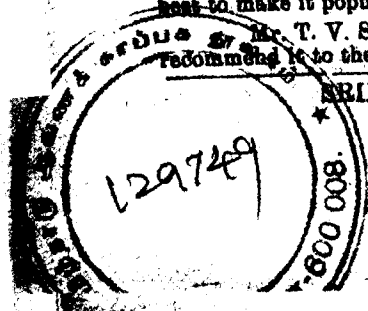
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