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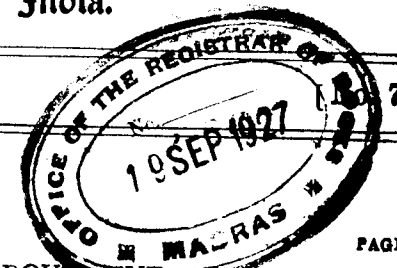
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சைதாப்பேட்டை உசர்ஸ் காலேஜ் கணிதபோதகாசிரியர் S. பாலகிருஷ்ண அய்யர், B.A., L.T.,
அவர்களுடைய முன்னுரையுடன் கூடியது.

(முதல் பாகம்.)

பொருளடக்கம்.

I. எண் மானமும் எண் குறிப்பும் :—எண்கள் ; இலக்கங்களால் எண்களைக் குறித்தல் ; எண்களின் சுயமதிப்பும் ஸ்தான மதிப்பும் ; ரோமன் வழி. II. கோடுகளும் புள்ளிகளும் நீள அளவையும் :—கீழ்ப் ; ஸர் பெஸ்கன் ; கோடுகள் ; புள்ளிகள் ; கோடுகளின் வகைகளும் கோடுகளைப் பரீட்சிக்கும் விதமும் ; புள்ளிகள் குறித்தலும் கோடுகள் இழுத்தலும் ; நீள அளவு ; டிவீஷன்களின் உபயோகம் ; எண்களை நீளத்தால் குறித்தல். III. கூட்டல் :—கூட்டலின் அர்த்தமும் உபயோகமும் ; கூட்டலைப்பற்றிய ஓர் உண்மை ; கூட்டலைப் படத்தால் காண்பித்தல் ; அடைப்புக் குறிகள் ; கூட்டல் ; பெரிய கணக்குகள் ; கழித்தல் ; கழித்தலைப் படத்தால் காட்டுதல் ; பலவகை கழித்தல் வழிகள் ; கூட்டல் கழித்தலைப்பற்றிய ஓர் விதி ; கலப்புக் கூட்டலும் கழித்தலும். IV. பெருக்கல் :—பெருக்கலைப் படத்தால் காண்பித்தல் ; ஒரு ஸ்தான எண்ணால் பெருக்கல் ; பாக்டர்களால் பெருக்கல் ; எந்த எண்களைக் கொண்டும் பெருக்கல் ; பெருக்கலில் குறுக்கு வழிகள். V. வகுத்தல் :—வகுத்தலைப் படத்தில் காட்டுதல் ; ஒரு ஸ்தானத்தால் வகுத்தல் ; பாக்டர்களால் வகுத்தல் ; 10, 100 முதலிய வகைகளால் வகுத்தல் ; நீள வகுத்தல் ; வகுத்தலின் இன்னொரு அர்த்தம் ; சில பெருக்கல் வகுத்தல் விதிகள் பெருக்கல் வகுத்தலில் சில குறுக்கு வழிகள் ; ஒன்பதுகளை நீக்குதல். VI. பலவின் வெண்கள் :—அளவு வாய்ப்பாடுகள் ; நாணய அளவுகள் ; சிறை அளவுகள் ; நீள அளவு ; படித்தல் அளவு ; கால அளவு ; க1. அளவு ; எண்ணிக்கை அளவு ; இனமாற்றத்தல் ; பலவின் வெண் கூட்டல் ; கழித்தல் ; பலவின் வெண் பெருக்கல் ; பலவின் வெண் வகுத்தல். VII. கோணங்களும் அவற்றின் அளவும் :—திசை, திசைமாற்றம் கோணம், கோணங்களை ஒப்பிட்டுப் பார்த்தல் ; கோணங்கள் ; சதுரங்களும் ரெக்டாங்கிள்களும் ; வட்டங்கள் ; புள்ளியிடத்தில் உள்ள கோணங்கள். VIII. டெஸிமல்கள் :—டெஸிமல்களின் அர்த்தம் ; டெஸிமல் குறிப்பில் ஸ்தான மதிப்பு ; இரண்டாவது டெஸிமல் ஸ்தானம் ; டெஸிமல் குறிப்பு பொது விவரம் ; ஒரு டெஸிமல் ஸ்தானமுள்ள எண்கள் ; டெஸிமல் கூட்டல் ; டெஸிமல் கழித்தல் ; எந்த எண்களையும் கழித்தல் ; 10, 100 முதலியவகைகளால் பெருக்கல் ; ஒரு ஸ்தானமுள்ள முழு எண்ணால் பெருக்கல் ; ஒரு ஸ்தானமுள்ள முழு எண்ணால் வகுத்தல் ; பல ஸ்தான முழு எண்களால் பெருக்கல் ; பல ஸ்தான முழு எண்களால் வகுத்தல்.

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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 படத்தால் காட்டல் ; உ. பொ. அ. பொது வழி. X. சாதாரண பின்னங்கள் :—பலவின் அளவுகளின் பின்னங்கள் ; ஒரு கான்கீர்ட் அளவை இன்னொரு கான்கீர்ட் அளவின் பின்னமாகச் சொல்லுதல் ; சமமான பின்னங்கள் ; சமமான பின்னங்களைப் படத்தால் 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 டிவிசனே பர் உள்ளபடி மாற்றல் ; பின்னங்களைச் சுருக்கல். IX. வாடிக்கை முறை.—பலமாதிரிக் கணக்குகள். பரீட்சைக் கேள்விகள். விடைகள்.

முதல் பாகம் 1-வது வகுப்புக்கும் 1-வது பார்த்திற்கும், கிரௌன் 300 பக்கங்கள், விலை அணா 14.

(இரண்டாம் பாகம்.)

பொருளடக்கம்.

பரீட்சைக் கேள்விகள். I. டெஸிமல்களின் பெருக்கலும் வகுத்தலும் : ஒரு ஸ்தான டெஸிமல் எண்ணால் பெருக்கல் ; சமமான பரிசேதனை ; எந்த டெஸிமல் எண்ணாலும் பெருக்கல் ; டெஸிமல்களால் வகுத்தல் ; சமராய்ச் சொல்லல் ; சாதாரண பின்னங்களை டெஸிமல்களாக மாற்றல் ; டெஸிமல்களை சாதாரண பின்னங்களாக மாற்றல். II. சராசரி, டிவிஷியோ முதலானவை : சராசரி ; ரேஷியோ ; மாறாத ரேஷியோ ; ரேஷியோவின் உபயோகங்கள் ; பார்போஷன் ; லாப நஷ்டம், வருமான வரி ; கடன் மிகுதல். III. பாப் பளவு : பார்பளவு ; ரெக்டாங்கிள் ; இங்கிலீஷ் பார்பளவுகளும் பிரெஞ்சு பார்பளவுகளும் ; பார்பளவு வாய்ப்பாடுகள் ; பிரான் வரைதல், அதாவது அமைப்புறவும் வரைதல் ; தரையின் பார்பளவும் நாய்கவர்களின் பார்பளவும் ; கட்டக் காகிதத்தின் உபயோகம். IV. பொது எண் கணக்கு—சமீகாணங்கள் : அங்க சனிதமும் பீஜ கனிதமும் ; சில பெயர் விளக்கங்கள் ; சமீகாணங்கள் ; இன அங்கங்கள் ; அடைப்புக் குறிகள் நீக்குதல். V. முக்கோணங்கள் : அவற்றின் பக்கங்களும் கோணங்களும் ; முக்கோண விரிப்பு ; முக்கோணங்களின் கோணங்கள் பக்கங்களுக்குள்ள சம்பந்தங்கள் ; ஒரு புள்ளியிலிருந்து சிபந்தனைக்கணக்க மற்றொரு புள்ளி குறித்தல் ; இரண்டு புள்ளிகளிலிருந்து சிபந்தனைகளுக்குக் கணக்க மற்றொரு புள்ளி குறித்தல் ; கொடுக்கப்பட்ட அளவுகளைக் கொண்டு முக்கோணம் வரைதல் ; வட்டங்களின் சில தன்மைகள் ; முக்கோணங்களின் வகைகள் ; ஓர் புள்ளியிலிருந்து ஓர் கோட்டிற்கு பெர்பெண்டிகுலர். VI. கோடுகளையும் கோணங்களையும் இருசமபாகங் களாகக் கல் : இருசம பக்க முக்கோணங்களின் சில தன்மைகள் ; கோடுகளை இருசம பாகங்களாக்குதல் ; கோணங்களை இருசம பாகங்களாக்குதல் ; கார்ட்களையும் வட்ட பாகங்களையும் இரண்டு சம பாகங்களாக்குதல் ; பெர்பெண்டிகுலர்கள் இழுத்தல் ; விமெட்ரி. பலமாதிரிக் கணக்குகள் ; முதல் பாகப் பாடங்களில் புதிய கணக்குகள் :—கூட்டல் கழித்தல் ; பெருக்கல் ; வகுத்தல் ; பலவின் எண்கள் ; கோணங்களும் வட்டங்களும் ; டெஸிமல்கள் ; உயர்ந்தபொது அளவும் ; தாழ்ந்த பொது மடங்கும் ; சாதாரண பின்னங்கள் ; பலமாதிரி, இரண்டாம் பாகப்பாடங்களில் பலமாதிரிக் கணக்குகள். பரீட்சைக் கேள்விகள். அனுபந்தம். விடைகள்.

இரண்டாம் பாகம் 2-வது பார்த்திற்கு, கிரௌன் 208 பக்கங்கள். விலை அணா 10.

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CO-OPERATION AND THE SCHOOL-MASTER.*

By Mr. C. F. STRICKLAND, I.C.S.

BEFORE speaking to you about co-operation, I want to consider a broader aspect of the whole question, that is, the relation between the school-master and the nation which he is educating, or which he is endeavouring to create in so far as a nation is not already formed in any country. The school, whether in the village or in the town, ought to be the centre of social enlightenment. It should be the centre to which all persons who are interested in any new movement, social or economic, would first turn for advice, for sympathy, and for organization of meetings, and later for guidance when the movement which they are striving to start has been launched. In countries such as the United States of America, particularly in the

less advanced States, the leader of the Local Committee is very often the school-master; certainly if he is a man, and sometimes also if, as frequently in European countries and in America, the teacher is a woman.

Undoubtedly it is a part of the function of a school-master to train students to pass examinations. I do not accuse you of thinking that examinations are the only object of education or of the school-master's work. More particularly in a democratic country, in a country which has attained or is moving towards self-government, it is quite essential that in order to justify itself to the democracy, to the electorate, the school shall prescribe examinations for its students and endeavour to make them pass. But I admit that you look further, that you aim not only at examinations but at making your students really educated men, giving them every kind of valuable information and also building up their character. Nevertheless in this country

* A lecture delivered at the Training College, Lahore.

even the broadest-minded school-masters are liable to think that their duty is only towards the students in their schools. I particularly emphasize that this is not their view in other countries and it should not be so in India or in the Punjab.

The school-master is a public functionary just as much as the burgomaster of a European town, just as much as the Lambardar or Thanedar of an Indian village. The school-master, though he is not in all cases a servant of Government, has a definite function to perform in the community; not merely to impart information but also to spread enlightenment to those whom he teaches, and to the parents and every single member of the community in which he lives. Is that the case in the Punjab? It may be so where we have an exceptional person, either in a village where a man of moderate education is living in a largely illiterate circle, or in a town where a man of advanced education, especially, if free from communal animosities, is able to give a lead to all classes and to exercise a really precious influence, not only on juveniles but also on adults, but I cannot claim that this is ordinarily his position.

Some of you perhaps have seen an article published last year in the *Punjab Educational Journal* on Scandinavian Folk High Schools, and no doubt your studies have covered the Folk High Schools. You might find that article instructive as illustrating my point that the school and the school-master is in Scandinavia, as it should be everywhere, the centre of local life. Naturally in the Folk High School, a rural institution, the school-master's relation is chiefly towards the villagers, but it is not only in the Folk High Schools of Denmark, or the Rural Schools of America or other

countries that you find the school-master respected and treated as a leader. It is so in England also, and even more so perhaps in some parts of Ireland where conditions resemble somewhat closely those of the Punjab. The school-master, if he is a generous-minded man, is the man to whom everybody will turn. He is the man who feels it his duty, as a servant as well as a leader of the community, to help everybody who turns to him. There has been a new movement on these lines both in Ireland and in England in recent years. You have no doubt read of the Rural Community Councils; these are semi-official bodies containing a number of officials from the County Councils (equivalent to District Boards) and a certain number of non-officials connected with social organisations, such as boy scouts, girl guides, farmer's clubs, women's institutes, agricultural and co-operative societies, etc. All these are brought together in a semi-official group which endeavours to make rural life in the English villages a less uninteresting thing than it has been becoming for the last hundred years. I say the last hundred years because the devitalization, the "bleeding" of English rural life, dates from the time of the industrial revolution which has caused the towns to grow up into enormous congested masses, full of excitement and disease and full, in the end, of unhappiness; and it is partly in order to counteract that flux towards the towns that Rural Community Councils have been set up in England and Ireland. They now exist in about half the counties of the two islands. Their object is to co-ordinate the activities of social institutions, scouts, guides, clubs, church, army, etc.; I am speaking of English conditions, but you can easily imagine similar Sabhas, Anjumans,

Samitis, and so forth that would spring up in India for various purposes if Indian life in villages and in towns were organic. You might easily have in Indian towns, still more in the villages, a group of persons associated for the purpose of encouraging one another to maintain gardens, not necessarily for food, but for pleasure, for beauty, for the love of flowers; you might similarly have, as we have in every English county, associations for the education of adults, and perhaps hereafter, as in European life, you may have a number of institutions connected with women. In both cases there is the co-operative organization promoting rural industries and agriculture.

In England it is not a school-master who is a member of the council; in England here schools are spread through all the villages, they admit to the councils the local officers equivalent to the Indian District Inspector of Schools; he being on the rural community council of the county, his influence will secure that wherever in a village a lecture is to be given by any department of Government or any private institution, the school-master will give all assistance in his power. Can you call the villagers? Can you borrow a magic lantern? Can you arrange for a lecturer coming into the village to be taken in as a guest by somebody? The man to whom they turn for such work is the school-master; he is the ganglion of all the nerves; he is the point at which all the fibres of rural, and in many cases, of urban life, run together. He may not be the social leader. The school-master is often in England a man of small income and of simple habits; yet if he is a man of high character and broad views, he is not limited to his technical duties, but shares all local interests.

One of the most valuable activities of the rural community councils in England and Ireland, and I believe also in America, has been the formation of village libraries, town libraries and travelling libraries. A large trust was created by Mr. Carnegie of the United States of America, 20 or more years ago, whereby he left the bulk of his money for the benefit and education of his own countrymen in Scotland, but the amount available was so great that the trust was extended to Ireland and England. The Carnegie Trust now provides a free supply of books to every county which is willing to impose a local rate for its maintenance, saying to the county council that if you through your rural community council will undertake to manage and finance the library, we undertake to pay the whole initial cost, and to give our skilled supervision during the first two years. Now I have taken you far from Indian conditions. Yet you may have heard that only a few days ago, a Rural Community Board was founded in the Punjab. The Director of Public Health has during the last year been sending his assistants to lecture on questions of hygiene in villages and towns, and providing them with magic lanterns supplied by the Red Cross Society. The Rural Community Board intends to set up councils similar to those of England and Ireland in all districts of the Punjab in which it is found possible to bring together a number of public-spirited and educated men. The agency through which the Rural Community Board in the Punjab and the Rural Community Council in the District will work is quite rightly the school-master in the town or in the village. It is proposed to supply every district with one or two magic lanterns which will be in charge of the Science-master of the Govern-

ment High School. The Council will be composed partly of members of the District Boards and partly of local officials or non-officials, such as Inspectors of Education or Agriculture. The lanterns will be taken to the schools, the headmaster will be invited to attend the lecture and to bring together an audience from both the juvenile and the adult school. The object of a rural community board may be described as the enlightenment of rural and urban citizens. I particularly say "citizens" because I want you to realize how eminently dangerous to India and the Punjab it must be to have a large number of electors and voters for the local Legislative Councils or for the Indian Assembly who are illiterate and ignorant. What can be worse? You place your own fortune and the fortune of the whole country in the hands of people who are still in many cases quite ignorant. I feel a warm sympathy for them and yet sometimes they are scarcely beyond the animal as regards general intelligence.

Now that is to be altered, but it cannot be altered merely by giving formal education in the schools. It must be done by broadening a man's mind and making him a real citizen. He must understand why there is a district board. Who repairs the roads? Why is it necessary to compel him to assist in repairing the bank of a broken canal? At the present moment it is *Sirkar ka hukam, Sirkar ka zulm*. Even though he is willing to support Government, yet this Government to him is some strange, remote, unemotional, or possibly immoral being. He does not recognise that Government means you and me, and men just like us, men who become tired and angry, very human; and yet in most cases trying to do what they believe

to be the honest thing, working for the good of the country, and for the good of that particular man who complains against them.

I remember going into a farm-house in Sweden where I sat down to tea with the farmer and his wife. They could speak scarcely any English but both could read it, and they had English books, French books, German books, Italian books on their book-shelf. The man was a farmer possessing 100 acres of land. How many farmers in the Punjab with a hundred acres of good land would be able to read English, Persian, Urdu and Arabic or Sanskrit? He had not learned these languages at school, but he had learned them himself because he had in the village a centre of light in the school, where people would meet and discuss political and social subjects, and matters concerning other countries, as well as the education of their children, and therefore they had been encouraged to teach themselves. Is that possible in the Punjab?

I should like you to feel that you have to aim at something very wide. I have travelled in many countries of Europe, and I do not think there is any country in which the land is naturally more fertile than in the Punjab, or where the people if they were led by genuine leaders could attain to a higher level. Natural intelligence in the Punjab is as high as in Europe; what is lacking is the spirit of national union. By that I do not mean joining together to attack somebody else, though that is the usual form in which a temporary unity is created. You must go beyond that. The school-master ought to be the man to make every boy and every man in the town and in the village realize that he is the citizen of a great country, and whatever may

be his personal defects he has to correct or overcome them by aiming at high personal and national ideals.

Now I pass to my special subject of Co-operation. What is Co-operation? Some of you might reply that it is a form of banking to free villagers and townsmen from debt. No, that is a comparatively unimportant element with which owing to local conditions in the Punjab we have at present had to be content; but we are not content in reality. Co-operation is a form of organization, a method of organizing people for anything you please so long as it is an honest purpose; it is a way of organizing people both for action and for thought, both for material purposes, and also for spiritual purposes.

How is it related to this national aspiration which I have tried to set before you as an ideal for the school-master? Few men have sufficient strength of character to aspire to an ideal morally or spiritually high, so long as they are in distress owing to debt, or so long as they are in a state of unhappiness and depression of any kind; they will never really try to make themselves or their neighbours good citizens. That is why co-operation begins by trying to raise the economic condition of the people. But its further object is to raise also their souls, to make them better men, better citizens, better patriots in the true sense which I have described. Therefore in the work of co-operation we begin by trying to raise the economic condition of artisans, clerks, farmers, and the great mass of people in the country. You know that the great majority of the population, nine men out of every ten, live in villages, but all the new civilization, the valuable and advanced thought which is spreading in the towns, is leaving the villages

behind; yet we ought not to go on doing everything for the one man in the town, forgetting the nine men in the villages, still less should we give such an education as to bring the nine men into the towns. Let them remain in the villages, but let us train them to be good countrymen and intelligent citizens. Co-operation aims at this goal.

Have you read any book describing the more intimate and social life of the Japanese? There is an excellent book by Dr. Robertson Scott "The Foundations of Japan". Few Englishmen can do what he has done—forget himself and his own point of view, and go round the Japanese villages understanding their point of view, and looking at life as it must appear to them. He shows repeatedly that the village life of Japan is now organized for co-operation, for agriculture, for industries, for social life, and even in associations for waking up early in the morning—an amusing idea and yet evidence of a sound organic life. Or turn to European countries, especially those in which the towns, as in India, are less dominant than in England. Take, for instance, the Balkan countries, e.g., Roumania, or consider Catholic countries such as Italy or Belgium. There you will find, as in Japan, that village life is organized. Associations exist for agriculture, for religious purposes, for political purposes, for social purposes. Who leads those Associations? Two men,—one is the priest whom it is almost impossible to bring into the same position in India on account of the differences in religion, but who in most of the Catholic countries of Europe takes a leading part in co-operative activities, often in politics, certainly in social reforms; the second man is the school-master. Co-operation in Roumania, an agricultural country

now rapidly advancing, was practically founded by school-masters. Its first organization was in the hands of school-masters, and to-day there is scarcely a village throughout the country in which co-operation is not widely developed; and it is still in many cases under the guidance of the school-master. What is that school-master actually doing? He is making citizens; he is not merely teaching boys as in the Punjab. You, gentlemen, are to be school-masters, and you are the men who have to make true citizens.

I will suggest three main heads under which one may class the work of the school-master in organising village or urban people. He can first guide them towards an improvement of their economic condition. That may seem to lay a very heavy burden on the school-master. But I do not propose that he should himself engage in trade, rather he should assist other persons, whether they are agricultural or industrial advisers, non-officials or social reformers, and whether he agrees with their opinions or not, to form active associations for economic ends. A school-master need not consider that he is in any way abandoning his self-respect if he constitutes himself an agency for enlightening people by giving them an opportunity of forming their opinion, i.e., he encourages them to discuss all kinds of thought and work, whether he himself agrees with them or not. He should be glad to see threads of interest, threads of common thought, running through the community of which he is a member, and should therefore assist people to join together for almost any purpose. I can hardly conceive of any purpose, not directly criminal, which is not better than *no purpose at all*. The position at present is that in Indian society, particularly

in villages, with the exception of carrying on the daily trade and educating the children, there is no purpose at all in a man's life and still less in a woman's; and such a purpose can be created by helping them to associate themselves.

Here I bring you back to co-operation. How much the school-master could effect in a village if he were constantly to point out to the people that what other countries have done India can do. That is the lesson he should teach in regard to Co-operation also. If he himself is not an agriculturist and if he cannot help people in this respect with the same intimate knowledge of agriculture which they possess, let him read their lectures, extracts from books, or give them informal talks about Japan, Belgium, America and England, and insist that nothing done in those countries is beyond their power if they will organize their daily life and open their minds.

We co-operators have always cordially welcomed the help of school-masters, claiming it not merely as a part of their duty as Government servants but because this work is in reality making India a nation. You must bind the people in their common life before they can make allowances for one another and forget their political differences, social differences and religious quarrels.

Now the second point; we must teach them thrift. How often when I have talked to men in the village or in the town about thrift, they have answered that India is a poor country, or the Punjab is a poor country. I am afraid, my answer to their objection is somewhat paradoxical, but my answer is this: You cannot get out of debt unless you *first* begin to save. Only

when a man has formed the saving habit, can he expect to pay his debts.

Why is India poor? In a sense India is poor, although I have said that no land in Europe is naturally so rich as the Punjab. I say 'naturally' because for the last 300 years European land has been enriched by manure, and the top 9 inches of the English soil is an artificial product. That is why the land is richer. But how did it happen? For a thousand years in these countries people have saved and saved and gradually accumulated money by means of which they could carry out improvements, and all their later wealth has been built up on these small savings. You *must* save before you can escape from poverty; there is no escape unless you *save first*. That is why the staff of the department have been for the last few years striving so hard to found societies of co-operative thrift among school-masters. The masters may find the money they save useful, but we wish to find the masters useful. A man who has learned to save can teach others to save, and without saving this country can never make progress. I would like every one of you, when you are in charge of a school hereafter, to set a very simple sum in Arithmetic to your pupils. One man has made no savings; he needs money and borrows Rs. 100 at 25%. He is paid Rs. 50 a month. He decides to save Rs. 3 or Rs. 5 in order to pay his debt; and he does thus gradually pay off the debt. He, of course, pays interest all the time. If he saves Rs. 5, he will probably not pay off the debt before about 26 months, because of the interest. Another man begins by saving Rs. 5 a month, and has been saving for 26 months. He deposits it in the co-operative bank; he receives interest on his deposit

at 6% and re-deposits the interest every six months. Then ask your boys what the first man has paid during the 26 months and what the second man has saved by the end of the same period. Then you will realize how necessary is thrift.

A man is in debt not because he is unfortunate or because he has to pay for his father's funeral, not because he has three daughters to marry, but because he has not saved for these purposes. He should have saved beforehand. When his first daughter was born, he should have gone to the nearest post office or co-operative bank and should have opened an account, depositing eight annas a month, and only withdrawing it when his daughter was to be married. Work out the total at eight annas a month for fifteen years with compound interest at 6%.

The third branch of work to which, I think, the school-master can and should attend in villages or towns is one which presents difficulties at present in India. He will be welcomed if he comes forward to assist in economic organization, and will certainly not be resented if he invites other people to practise thrift and stimulates them by his own example. But he is to think not only of their bodies but also of their souls. I would like to see the school-master's influence, exerted—as in America, and to some extent in Ireland, though not much in England—in the direction of stopping quarrels. It is not enough for the leader of a rural community to abstain from quarrelling. He must do more. I admit that it is not possible for him as an educated man to interfere directly in their quarrels; if he does he will very soon find himself in hot water. I wonder how many of you know which is the biggest industry in the Punjab? (A voice 'litigation'). No,

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the biggest industry is money-lending, and litigation is the second biggest. I do not think this is true of any other country except possibly of Egypt, but here in the Punjab money-lending is the first industry and litigation the second. Unfortunately, these industries cannot be entirely wiped out, yet I think that as good citizens, we should do what we can to reduce the evil of these terrible diseases that are destroying this country. How then can the school-master help to stop litigation?

Four years ago a type of co-operative societies was formed solely for the purpose of arbitration. Members who joined the society pledged themselves to refer every single dispute on any subject whatever with any other member to the society for decision. There arose a legal difficulty, and for technical and other reasons, these societies were suppressed by the orders of a Minister. But new by-laws have recently been approved by Government, and it is now permissible to found co-operative societies for arbitration. Now consider; you may as a member of the society of arbitration, have a true claim against your neighbour, you may refer it to the society, and they may in good faith decide against you and you may lose your true claim. Is that a bigger loss, or is it a graver loss to be involved in litigation and fight your case out up to the High Court and win your claim but find yourself ruined? I have no doubt of the right answer to this question, and if you have the clearness of sight and the courage to give that answer, you will as school-masters work for co-operative arbitration.

Again there is a new kind of co-operative society, recently founded—societies of better living. A number of members, villagers

or townsmen, pledge themselves to meet from time to time in meetings, and to decide that on such and such a ceremony we will spend only so much, or we will not send our women to the bazaar for shopping, and so on. It is no use founding such a society unless the decision can be enforced. But it can be. The decision is not enforced by Government, it is enforced by the members of the society, but there is legal provision that members who enter into a co-operative agreement of this nature and break it, may be fined by the society up to whatever amount is stated in the by-laws, and Government, on the application of the society, will assist in realising the fine. Here too the school-master can lend his influence to explain and organize.

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JULY 1927.]

THE FUTURE OF INDIAN EDUCATION.

An Address by Prof. P. SESHADRI, M.A.

(FROM OUR SPECIAL CORRESPONDENT.)

SIMLA, 5th June '27.

INTRODUCTION.

ON the invitation of the members of the United Provinces Hindu Association, Simla, Prof. P. Seshadri, M.A., of the Benares Hindu University, gave an address last evening on the *Future of Indian Education*. He said it was an old tradition since the days of Rudyard Kipling that people came up to Simla not for serious work, but for pleasure. It had been denied on behalf of officialdom by more than one responsible person, but on-officials could not pretend they came up to Simla for serious work and lecturing engagements undoubtedly seemed to interfere with the holiday spirit. But having already spent ten years of active life in the United Provinces, Prof. Seshadri said, he almost felt he was one of themselves and could not refuse to accept the kind invitation extended to him. It was probably not very cautious to speak on the future of Indian education. It was most dangerous to indulge in the spirit of prognostication of coming events and it was no wonder that Dante confined such people to a section of purgatory, where they were walking in one direction, their eyes facing the other. He was however content that evening to refer to a few directions in which development seemed necessary for the effective progress of Indian education.

THE FOUNDATIONS OF THE PAST.

Prof. Seshadri claimed that as in almost every other sphere of national activity, the future of Indian education had to be built on the past and he had no hesitation in

thinking that progress should be on the lines already marked out during the last fifty or sixty years of the Indian educational system. It was the fashion in some quarters to indulge in sweeping denunciations of the present educational system as if it was in the sphere of education alone that everything was wrong and radical reform was necessary. It was true that improvements were possible in many directions as in the case of all human institutions, but he did not doubt that the foundations of the educational system had been well and truly laid and they had no reason to be ashamed of the achievements in the past. No violent breaking away with the existing system was necessary as people who attempted it had discovered to their cost in recent years.

INDIAN UNIVERSITIES.

If the Indian educational system was to discharge its highest obligations to the country, the Universities had to be developed immensely, so as to serve as effective centres of higher education comparable to the great Universities of the West. The mere inauguration of new Universities was not a great achievement, unless it was accompanied by the coming in of more efficient educational conditions, better libraries, more high class laboratories, a superior and leisured staff, in fact, everything conducive to higher standards of education. The Universities all over India were seriously handicapped by want of funds and found it very hard to embark on new lines of research and development. Lord Lytton's Committee on Indian Students in Great Britain had recommended that the Indian educational system should be made 'self-contained' so as to eliminate the need for students to go to Universities in the West. Not much progress had been achieved in the

direction. A fictitious value continued to be attached to foreign degrees, merely as foreign degrees, by the Government as well as the public, and Indian Universities continued to be treated as belonging necessarily to an inferior type. A wave of indignation was passing through the country about the racial discrimination of people in Edinburgh against the colony of Indian students. The proper solution however of the question seemed to him to be that Indians should not wait at the gates of British Universities, begging to be taken in and treated without any marks of inferiority, but make their own Universities high-class centres of education and eliminate the exodus altogether, except in very special cases. As no political progress was possible so long as Indians hung to the coat-tails of foreigners and looked for wisdom and guidance from England, no educational progress was possible, so long as the Indian Universities were not allowed to grow to their full stature and their best products were treated as necessarily inferior to those whose only distinction sometimes seemed to be that they commanded enough money to have a foreign education.

ADULT EDUCATION.

Adult education was another department to which special attention had to be directed. The acquisition of political privileges and their efficient maintenance required a certain minimum standard of enlightenment in the country. It was true that literacy did not always mean wisdom, nor its absence its utter negation, but the capacity to read and write and to understand spoken and written communications on serious topics were necessary for the sound exercise of citizenship. The percentage of literacy was advancing very slowly among the school-going popula-

tion, but without any attempt at adult education, they would have to wait for another generation for any appreciable results. The problem was being tackled only in the Punjab, of all provinces in India, where more than two thousand centres had already been established for adult education, with a programme which included not merely reading and writing but also lantern lectures, circulating libraries and so on.

EDUCATION AND EMPLOYMENT.

The time had probably come for the remodelling of the educational system to some extent, in relation to the question of the unemployment of the educated classes which seemed to have assumed serious proportions in some parts of the country. The supreme aim of education was not to qualify people for purposes of employment, nor could the administration of any country absorb in its services all the products of its schools and colleges. But the educational system should not be guilty of the folly of dumping a large number of 'half-baked' young men on the country who were not qualified to do anything in particular and who were acutely discontented because they could not turn their hands to any work. The bifurcation of the educational system so as to provide for those who wanted to branch off into some technical professions and the admission to Universities only of those who were really fit for higher education were solutions which had to be tried on a more effective scale. The people of the higher castes had to be educated to realise that their sons were not necessarily always fit for the learned professions and a successful motor-mechanic or a driver was not a less honourable member of society than a clerk struggling for existence in a public office.

THE EDUCATION OF WOMEN.

No aspect of the educational problem in India filled one with more despair than the education of women. The spread of literacy among women proceeded at a pace which would depress the most optimistic of hearts. More than that, there was the question whether the educational system could not be modified to some extent to provide for the special needs of those who wanted to marry and to settle down to domestic life. It was of course wrong to deny to any extent the highest facilities for education for women on the same lines as men. It was also true that girls went up to Universities generally for entering the professions and no great differentiation in educational courses was possible. Boys were not being trained only to become good husbands and good fathers and there was no reason why girls should be educated with the sole purpose of making them good wives and good mothers. But at the same time, the educational system might provide for subjects like music, painting and domestic science which would have a special attraction for girls who were looking forward to the great privileges of presiding over homes and bringing up families.

A PUBLIC SCHOOL FOR INDIA.

A scheme had recently been launched with a flourish of trumpets for the establishment of a Public School in India, one of whose great attractions was announced to be the coming of three Englishmen for running the institution! He confessed the idea left him somewhat cold. Its expensiveness made it unsuitable for a poor country like India and it was bound to deteriorate into a school for the children of aristocrats. It would do no good to them to be brought up in such an atmosphere of segregation and they were sure to develop vanity and snobbishness which had

no useful place in modern democratic life. To those who had absolute faith in the Public School system of education, he would commend the recent book of Prof. Bertrand Russell on *Education* where he had many illuminating paragraphs on the subject. At one time it trained hardy people, who played an active part in the expansion and government of the empire, dominating over those whom they had conquered, but it was futile to foster that spirit in the New Age. The idea of such aristocratic exclusiveness was entirely opposed to the best Indian traditions, in accordance with which the scions of princely families in ancient days went to the hermitages of ascetics for education with the poorest Brahmacharis. One of the most cherished recollections of Sri Krishna who belonged to the royal house of Dwaraka, was, it will be remembered, his companionship with the poor Brahmin child Sudama at school, and let us not lose the beautiful idea of equality underlying such companionship. The goddess of Saraswati made no distinction in her temple between the high and the low and an institution which, in effect, would cater only to those who paid inordinately high fees and considered it a matter of great pride to sit at the feet of Europeans who were 'fresh from England' can neither react beneficially on the present educational system nor rouse the imagination of Indians. Any available money in the country had better be spent on the strengthening of the existing high schools and let no Indian gentleman, however high placed, consider it beneath his dignity that his son should rub shoulders with the boys of an ordinary Indian high school and be taught by his own country-men.

The meeting dispersed with a vote of thanks to the Lecturer. Light refreshments and music were also provided by the Association in honour of the guest of the evening.

THE FUNCTION OF LITERARY CRITICISM

By

Mr. G. V. SUBBARAMAYYA, M.A. (Hons.),
Lecturer, V. R. College, Nellore.

THE word "criticism" is ultimately derived from the Greek verb "krinein" meaning "to separate (the good from the bad)" or "to judge." This function of "judgment" presupposes, of course, a thorough knowledge of the thing judged, a minute scrutiny of all its ins and outs. It therefore follows that the critic of literature must have complete mastery over the literary work he seeks to judge. Criticism that is prejudiced, superficial, or otherwise incompetent, is worse than none.

Now assuming that the critic is a scholar and has made the requisite sympathetic study of the work, how is he to proceed in judging the same? What set of principles or code of laws is he to apply? Till yesterday in India, and up to the 19th century in England, people had no difficulty in answering this question, since what were universally recognised as good laws of art and sound principles of criticism had been set down, for us in our Alankara Sastras, and for the West in such works as the "Poetics" of Aristotle and the "Ars Poetica" of Horace. The critic of the old order had simply to apply those principles and laws to any literary work and to say whether, and how far, it satisfied them. But the banner of rebellion against classical authority, once raised in the West, is being unfurled in India to-day; and from all portents, the fight seems likely to continue to the bitter end. It behoves us therefore to study the several phases through which the standard of critical judgment has passed in the West since its revolt against classical authority, and to take lessons

therefrom in the difficult task of safeguarding the best interests of our own literature.

The Post-Renaissance writers like Shakespeare openly violated the accepted classical traditions, and came in for censure at the hands of the contemporary and succeeding critics. But in course of time the inherent beauty of their works came to be increasingly felt and recognised, and their so-called offence against the classical rules correspondingly overlooked, till, at the dawn of the Romantic era, Lessing and Coleridge declared that it was a fundamental error to consider the classical rules final and immutable and to judge by them the work of modern geniuses who, in their opinion, need submit to no laws but such as can be deduced from their writings. Nay, they went further and in a way, tabooed the very idea of judgment in the function of criticism, by holding that, like Caesar, Genius can commit no wrong. The critic should approach the original writer as a devotee would do a shrine. Their whole 'criticism' was in short, a grand eulogium which by its very nature was extra-judicial. Yet their very selection of some works for praise implied the exercise of the faculty of judgment; only, in this case, the judgment was wholly partial to their favourites.

But the very idea of judgment even in the Romantic sense of literary hero-worship received disapprobation from Moulton who, in his able "plea for the inductive science of literary criticism" deals the most crushing blow at the criticism of judgment. He shows how the path of judicial criticism has been strewn with blunders of judgment, how fickle and unreliable have been the critical opinions of even the greatest scholars, and how the judicial frame of mind is utterly incapable of sympathetic understanding or appreciation.

He pleads for treating literature on a par with the modern sciences by discarding the very idea of judgment and confining ourselves to observation, analysis and formulation of hypothetical laws the correctness of which is to be known not by any external standard but by how far they serve to interpret and explain the original work itself. In other words the province of literary criticism is, in his opinion, study, interpretation and analysis and nothing more.

In the first place, this conception of criticism militates against the root-meaning of the word. But even granting its use in the altered sense, the whole plea seems to be vitiated by the fallacy that literature is fully analogous with the scientist's data, namely, God's creation. There is one fundamental difference between the two. The latter cannot be changed in the least by man, even if he so wishes. It is there and must be accepted in its entirety as inevitable. So the scientist has perforce to content himself with observing the actual facts, analysing them and studying the laws of their being. On the other hand, literature is but man's making. It deals not with matter but with ideas and therefore provides unlimited scope for every alteration. It is mainly concerned not with 'what is,' but with 'what ought to be,' which every one has to decide for himself by his taste.

So, to taboo judgment and advocate 'inductive criticism' on the analogy of the Sciences seems erroneous. Indeed, where the so-called 'inductive criticism' ends, the true criticism begins, of which the very soul is judgment.

Now since tastes vary with men, should not judgments also differ? If they do, how can there be any standard of criticism? This

argument would be valid, if literary judgment were identical with impressionism. But the very word 'judgment' implies the application, deliberate or instinctive, of certain principles in order to "separate the good from the bad." When we say for instance that the past critics judged wrongly in a certain case, we mean that their principles were either defective or, though correct, were wrongly applied. Thus analysing, we get to this principle of right judgment, namely, that the principles sought to be applied must be sound and that the manner of their application must be proper. This in fact was the stand taken up by neo-classicists like Bradley, Walter Pater and Matthew Arnold. To the question "where then can we find the sound principles of literary art?" they replied, "go to Aristotle and the classics." To the further question whether the classical canons had not been tried and found wanting, they roundly answered "No; Aristotle's principles are alright, and they hold good for all time. The whole mistake is that of the later interpreters of Aristotle, who not only failed to distinguish the essential and permanent from the unessential and temporary in his work, but had the temerity to interpolate their own fads such as the Dramatic Unities of Time and Place." So, according to them, the classical standards must serve as our final authority, provided, of course, they are correctly interpreted.

It is pertinent for us, therefore, to ascertain what the fundamental classical principles are as interpreted by the neo-classicists. Aristotle defines Art as imitation of Nature, not of external nature merely, not of "what is," but of the universal in nature, of "what ought to be" as determined by the laws of probability or necessity. How are we to know whether

a piece of literary art is good, in other words, whether the imitation of "what ought to be" has been successful? The key to this knowledge is the permanent pleasure the work produces in our minds. Whence does this pleasure spring? It arises when our sense of the probable or inevitable is satisfied by the work. How far, then, a literary work satisfies our sense of the probable or inevitable, and thus by successful imitation of the universal in nature, produces permanent pleasure in our minds must form a correct measure of our approbation.

Can we accept this test and measure of literary judgment as infallible? One circumstance unmistakably points to the answer in the affirmative. It is the remarkable coincidence that we find between the above standard and the one laid down in our Sanskrit classics. The author of "Sahitya-Darpanam" defines a literary work as "a composition which yields Rasa." He then describes "Rasa" as follows:—"It is of excessive virtue, indivisible, self-radiant, full of bliss and knowledge, devoid of even the touch of any other known thing, akin to the bliss of God-realisation, having its very life in a transcendental excellence enjoyed by a few through sympathy as though it were in themselves." Now we realise that this 'Rasa' is precisely the 'permanent pleasure' mentioned by Aristotle. "It is produced by the sympathetic imitation of the objects in their original setting, complication and development, which together comprise 'Nature.' Besides, the imitation must have a peculiar 'bloom' not to be found in actual life."* Does this not exactly coincide with Aristotle's view that "every artist puts into imitation of external things something not to

* "Sahitya-Darpanam."

be found in the particular aspect of Nature," "that the object of imitation is not the particular but the universal"?

Granting the soundness of these first principles of art which seem so nearly common to both the Greeks and our ancients, there arises a fresh difficulty, that the above-described pleasure is neither uniform nor universal. Here again the very fact of our agreeing to speak of the greater and lesser works of art implies that there must be some means whereby the purity and refinement of this pleasure can be determined, that behind the infinitely varied conceptions of the laws of probability and necessity, there must be the true laws. Such means we are furnished with, in the practice of the great artists "not because they arbitrarily set down the law but since the permanent pleasure they give, proves that they have rightly obeyed the laws of probability or necessity." This would be possible if the artists in the world should agree in their practice. Do we find such agreement?

Courthope replies "there may not be universal agreement, but there is national agreement." Each nation has an individual mind, individual sense of the probable and inevitable or, in one word, the beautiful; and this is truly reflected in the works of its greatest artists. "Chinese, Hindu, Assyrian, Egyptian, Greek and the modern nations of Europe," says Courthope, "have all embodied in their art, their ideas of what is spiritual and unseen, and to reduce their opposite conceptions to a central law would be impossible." He therefore concludes that any true work of art must imitate the universal in nature as conceived by the nation to which the artist belongs. It may be readily admitted that most of the world's literary

works do not arise above the national limitations in their conception of the universal, and are therefore best appreciated by the members of the writer's nationality. But have we to submit to the national limitations even in judging the best works of art, the world's master-pieces? To this question, M. Arnold would give an emphatic "No." "Criticism," he says, "obeys an instinct prompting it to know the best that is known and thought in the world, irrespectively of the practice, politics and everything of the kind, and to value knowledge and thought as they approach this best without any other consideration whatever." "The English critic of literature," he further says, "must dwell much on foreign thought; and with particular heed on any part of it, which, while significant and fruitful in itself, is for any reason specially likely to escape him." Our whole endeavour must be, in his opinion, to transcend all national limitations in the highest criticism, to try to see the one "Absolute and Divine source of Ideal Beauty" as it really is, unclouded by national narrowness, and to proceed to judge by that knowledge. Are we not, for instance, appreciating Shakespeare, Romain Roland, Tolstoy and Emerson, as we

do our own Valmiki, Vyasa and Kalidasa? It may therefore be safely asserted that so far as the essential elements of art are concerned, there is neither East nor West, neither ancient nor modern, that, in them, the great masters of art agree with one another, irrespective of their belonging to different nationalities, and that their common practice and the common principles of art laid down by all the great rhetoricians may be relied on as the criteria for judging any literary work.

To put the whole thesis in a nutshell, criticism is not only to study, analyse and interpret literature but to judge it. This it should do, not by applying any external code of laws, but according to the 'Rasa,' the 'permanent pleasure' it gives to an impartial, unprejudiced mind thoroughly conversant with the practice of the greatest authors and the precepts of the greatest critics. The real test of merit is this Rasa alone, because, as Pope so felicitously puts it:

"Some beauties yet no precepts can declare,
For there's a happiness as well as care.
Music resembles poetry; in each
Are nameless graces which no methods teach
And which a master-hand alone can reach."

BOOKS BY P. V. JAGADISAYYAR, of the Archaeological Dept., Madras.

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INTONATION AND PRONUNCIATION OF ENGLISH.

By

Mr. L. V. RAMASWAMI AIYAR, M.A., B.L.,
Ernakulam College, Cochin State.

THE pronunciation of a language is always easier acquired than its intonation. While the former concerns itself with the accurate values of sounds, the latter represents the faithful rise and fall of the *pitch* of the voice. The task of acquiring the correct intonation of a language is perhaps the last and the hardest part of language-study. Not unoften in public life we note instances of our countrymen who usually betray themselves into using the intonations of their vernaculars when they speak English of which they are otherwise perfect masters. Intonation varies with the language spoken, and a sentence like "The weather is bright to-day" may be uttered differently by people belonging to different nationalities. It is easy for any careful hearer to distinguish a certain provincial twang in the lectures or addresses of our public men; this is mostly due to the differences arising from the importation of their respective vernacular intonation into English utterance. Ordinarily, the English speeches of a Malayalee, an Andhra and a Tamilian might, on careful observation, be distinguished because of their respective provincial intonations. Even those who have put in a number of years' stay in England, easily fall into lapses, unless they deliberately cultivate correct English intonation. Amongst those few public men in India whose intonation of English speech may be characterised as faultless, the Right Hon'ble V. S. Srinivasa Sastri stands out conspicuous for meticulous accuracy. His success as a speaker in English, acknowledged

ungrudgingly by Englishmen themselves, is due not only to his accurate pronunciation of English, but also to his correct intoning of English words and passages. We shall not be doing him an injustice if we surmise that his mastery of English intonation is the result of deliberate cultivation without which it could not have been acquired.

The fault of incorrectly intoning a foreign language is not peculiar to Indians. The German or the Frenchman finds it as difficult to 'intone' English as the Englishman to learn the German intonation. An anecdote is related of a German scholar in English having failed to make himself understood by London coachmen though he talked to them in perfect cockney slang (of which he had made a special study) because he had missed the correct intonation!

One has necessarily to learn intonation by hearing natives talk, but the formulation of a few general rules and the representation of pitch-fall and pitch-rise by a definite system of notation will guide the student to regulate his intonation in the proper way. A handbook of English intonation embodying these features has been published by *Messrs. Heffer of Cambridge*. In this book (by *Lilias E. Armstrong* and *Ida C. Ward*, price 5 sh. net) the I. P. A. script is employed to transliterate sounds, and Prof. Klinghardt's system of notation to represent pitch-variations. Copious transcriptions are provided, for which orthographic texts are also given at the end. The subtleties of English intonation are dealt with in detail. To teachers of English Phonetics in our schools and to special students of Linguistics, the book will be of immense help.

Voice Training in Speech and Song, by *H. H. Hulbert* (University Tutorial Press,

WOMEN'S EDUCATION

By Mr. D. S. GORDON, M.A., LL.B.

Mysore Educational Service.

price 2sh. 3d.) is an exhaustive treatise on the articulation of sounds and voice-training. There are detailed discussions dealing with the Vibratory Apparatus, Breathing Apparatus, Control of the Breath, Distinct Articulation, etc. The chapters dealing with the analyses of English vowels and consonants are of special use to the student of Phonetics who will find here information not available in many other books of Phonetics. Common mistakes in articulation and pronunciation are also pointed out. Though these portions are not written with special reference to Indian conditions, much useful information can be gleaned by the Indian student also. The book is primarily intended for voice-users like singers, clergymen, barristers, etc., but the student of linguistics also stands to derive invaluable help and benefit from a perusal of this book.

THIS is a companion article to the one which I had contributed to the April issue of the "Educational Review," on "Men's Education." In it I had pointed out how useless our present system of education was and how inadequately it served the needs of the community and of the individual who set out to earn his livelihood. In the present essay it is proposed to examine in the same manner the education of the other sex in this country.

A well-informed European gentleman once remarked to me with a good deal of emphasis that the educational system of our country was quite "rotten." He was then speaking of men's education; but if his condemnation was true as regards men, it is even more so in the case of women. If the present system of education was unsuitable for men, it certainly cannot be suitable for women. Speaking of the powers of the British Parliament, some one has said that that august body could do everything except make a man a woman or a woman a man. But it would appear that our educational system in general, and our universities in particular, are even more powerful than the mother of parliaments; for their ordinary business seems to be to manufacture men out of women. Women go through the same course of instruction as men. Nay more; the modern woman apes man in other respects also, notably in sports and dress. In the West, university women are reported to be dissatisfied with their petticoats and taking to a form of loose trousers. Football and Hockey and other manly (or is it womanly?) games are coming into vogue. Apparently

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college women in India are still satisfied with their *saries* although the same thing may not be said with reference to their sports.

Time was when it used to be admitted without question that woman's proper sphere of activities was the Home. Household duties and the upbringing of children used to be thought the appropriate duties for which Nature had intended her. But this view will hardly go unchallenged now, not only by the women themselves but by a considerable section of men also. It is believed that household duties are too trivial for educated women's abilities or too narrow to engage their whole time and attention. There are others again who would emphasise the economic and political status of women. According to them if man alone were the bread-winner of the family it would be impossible to establish that equality of the sexes which is essential to modern civilisation. Her financial dependence upon the male would militate against the amelioration of the sex in the face of masculine aggressions to keep her subservient. On the political side too, women are becoming increasingly conscious of the important part that they should play in the government of countries. Women's franchise, and the representation of the sex in the highest councils and assemblies, is the order of the day.

These are some of the directions in which modern woman is progressing in the East and in the West. There is, however, some difference between the women's movement in India and among the white nationalities. There, women have been for a time conscious of their own limitations and disabilities and have fought and won their present position; whereas here, it may almost be said that their privileges

have been thrust upon women who were blissfully unaware of what they meant. The originators and leaders of the women's movement in this country are mostly men. This is no doubt as it should be, considering the helpless condition of the other sex. But in attempting their betterment the men have unfortunately blundered. They have failed to understand their real needs and have given the women what they do not want. This is especially so in the matter of education. It is a serious mistake to have prescribed the same educational system for both sexes—a mistake whose evil results are becoming apparent at the present time.

The most comprehensive charge that may be urged against women's education in India is that it has altered our fundamental conceptions of Hindu womanhood. The once-noble ideals set forth in the sacred books and exemplified in the ancient heroines such as Sita, Savitri, Damayanati and a host of others, have apparently vanished into thin air. New gods rule in their places. The ideal that man has set before the most intelligent woman of our country to-day is to become like himself. "Go through the High School and College courses," he says, "and secure university degrees like myself. Then, like myself, get into an office or set up as a doctor or even as a lawyer." What a noble ideal!

The subversive tendency of Indian women's education was recently brought home to me by the shrewd observation of a certain gentleman. He remarked that it is far more profitable to marry an educated woman than to be educated oneself. A woman with a man's university qualifications earns a much larger income and can therefore support her husband and children far more easily and in far greater comfort. Woman's

higher education is still something of a novelty and its market-value therefore is still much above par.

We are going on an absurdly wrong track in respect of women's education. The sooner a more rational system is adopted the better. The existing arrangements, as already observed, tend to make man of woman; and this is not as it should be. A good educational system is one which fits men and women for their several businesses in life. In economic science, division of labour is a well-known principle; and in ordinary life too this principle naturally applies. Men and women must be differently equipped for their different duties in life.

Let there be no misunderstanding. By saying that woman's sphere is the Home it is not by any means suggested that woman should refrain from taking an intelligent interest in the progress of the world at large. But what is urged is that woman's education should not be commercialised as at present.

Exception may be taken to the foregoing remarks about the sameness of education for men and women on the ground that this is not so. It may be pointed out that in our girls' schools subjects such as needlework, cookery, music, and other domestic arts find a place in the curriculum. But no one can be blind to the fact that these are of subsidiary interest, that they do not give a definite bent to the character of women's High School and lower education, and that they totally disappear in the college. Perhaps it is believed that these subjects do not possess sufficient dignity and cultural value to form courses of studies leading to university degrees. But I give below the outline

syllabus of a reputed American university which, it is hoped, will throw some light on the matter.

THE DEPARTMENT OF HOME ECONOMICS AND HOUSEHOLD ADMINISTRATION.

Home Economics, which is the study of the problems of the home and family, covers a field of human activity rather than a sharply limited subject-matter. The intelligent understanding of these problems involves a wide background in both the natural and social sciences. The sub-divisions of this broad field of home economics are:—Food and Nutrition, Home Management, Child Care and Training, Clothing, which includes Textiles and Related Art, and Institution Economics.*

I. Food and Nutrition.

- (a) Food and its Preparation
- (b) Meal Service and Food Purchase
- (c) The Science of Cooking
- (d) Nutrition and Dietetics
- (e) Chemistry of Food

II. Child Study.

- (a) Child Care
- (b) Child Physiology and Psychology

III. Home Management.

- (a) Household Organisation
- (b) Household Economics

IV. Textile and Clothing.

- (a) Garment Construction
- (b) Textiles
- (c) Costume Design
- (d) Interior Decoration
- (e) Textile Economics and Testing

* Institution is an American term used here to indicate large scale cooking, etc., as for instance, in hostels.

V. *Institution Economics.*

- (a) Institution Cooking
- (b) Catering
- (c) Institution Management
- (d) Applied Dietetics
- (e) Marketing
- (f) Organisation, Equipment and Administration

These courses lead to the degrees of B.A., M.A. and Ph. D. It is not suggested that the subject-matter of this syllabus should be taken up by every woman for higher study. Naturally there will be some who will take up other subjects in common with the men; but it is urged that the lower stages of women's education at least should point to the Home.

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A NOTE ON THE CORRECTION OF MATHEMATICAL ERRORS.

By

Mr. A. A. KRISHNASWAMI AYYANGAR, M.A., L.T.,
Maharajah's Collegiate High School, Mysore.

'WRITING in' every correction involves not merely undue strain on the teacher but becomes a tragic waste when it is found that the pupils do not seriously heed the corrections. Instead energy expended in impelling pupils to take to heart a few vital comments and to learn to correct their own mistakes is more effective and economical teaching. It is better for the teacher, therefore, to prepare a careful list of conventional marks on the analogy of the symbols of proof-
readers for the press and to leave to the pupil the task of reading his own proofs. Of course, before the pupils begin to correct their own mistakes, they must clearly understand the meaning and significance of the conventions employed. This may require one or two lessons in which the teacher may explain the conventions and illustrate them by correcting a few exercises in the presence of the boys. The importance of a pupil's written work can be felt by him only when he realises the amount of trouble thrown back on him in his correction.

The following conventions may be adopted for pointing out the various kinds of errors chiefly in arithmetical work:—

- (i) Errors in copying: 'C'
- (ii) Errors in mathematical facts: 'F'
- (iii) Psychological Errors: 'Psy'
for example, those due to 'perseveration' or persisting in consciousness of a certain idea; the repeated digit in 359×3 may obtrude unconscious-

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ly in a new context and lead to the error $359 \times 3 = 3077$.

- (iv) Errors due to imperfect grip of notation: 'N'
e.g., fixing the decimal place wrongly in division of decimals.
- (v) Errors in mathematical processes: 'P'
such as 'carrying' in addition.
- (vi) Errors in the application of rules and principles: 'r'
- (vii) Errors in understanding: 'U'
- (viii) Errors in reasoning: 'R'
such as false analogy and irrelevancy.
- (ix) Defects in style or presentation: 'S'
for example, using wrong abbreviations, suppressing steps, indicating them by mere lines.
- (x) Errors in arrangement: 'A'
e.g., mixing up of steps as in $27 + 3 = 9 + 4 = 13$, which is intended to mean $27 + 3 = 9$ and $9 + 4 = 13$. Haphazard scattering of steps and rough working may also be included under this head.
- (xi) Slips such as omission of a figure: 's'
- (xii) Verbal and linguistic errors such as bad spelling, bad expression: 'V'

The above classification and nomenclature are only suggestive and by no means exhaustive. The main difficulty in such classifications is that very often a mistake is not a simple one coming under the purview of any one of the above headings but a very complex one embracing more than one of the types mentioned. It is sometimes difficult also to determine to which

type a particular error may be said to belong, which depends on the point of view taken at the moment. Thus the error of cancelling the two's in $\frac{1x}{2x} = \frac{1}{2}$ may be pointed out as 'N' or 'r' or even 'R' if we consider that the cancelling is done by reasoning on analogy with $\frac{1d}{2d} = \frac{1}{2}$.

There is one point which makes the perception of errors in mathematical work more difficult than in any other school exercise, viz., the mathematical error unlike a grammatical or spelling mistake is more deep-seated and can be discovered by a teacher only after working out the necessary calculation himself separately.

Again errors (ix) and (xii) are generally deemed to be ignored in practice and it is generally thought that numerical work alone should be taken into account in the correction or evaluation of mathematical exercises, and on this score mathematical correction is mistaken to be a very light affair compared with the correction, say, of English Composition.

This wrong view is given official recognition when circulars are issued prescribing a scale for the number of exercises to be corrected in mathematics which is sometimes four times as much as the number prescribed in other subjects. It is high time that the wrong popular notion that mathematical valuation is based only on the little figure which forms the final answer is disabused and the public as well as the official circles come to realise the mathematics teacher's responsibilities in the matter of correction of exercises.

THE INDIAN CIVIL SERVICE EXAMINATION.

ANSWERS TO QUESTIONNAIRE *

By Prof. P. SESHADRI, M.A.,
Head of the Department of English, Benares Hindu
University; Secretary, Inter-University Board,
India.

1. Q. Do you think the present distribution of marks between compulsory subjects (900) and optional subjects (800) suitable?

A. The marks for compulsory and optional subjects may be made equal, by reducing the marks for the compulsory vernacular test from 200 to 100. The present number of 200 for vernacular composition seems rather extravagant.

2. Q. Do you think any additions, e.g., English Literature, English History, or Indian History, or Geography should be made to the list of compulsory subjects?

A. It is eminently desirable that there should be a compulsory paper on Indian History and Geography of a fairly advanced kind carrying 100 marks. Candidates who aspire to enter the Indian Civil Service by a competitive examination in India should obviously have a very good knowledge of the history and the geography of the country in which their years of service are to be spent.

3. Q. Do you think any omissions should be made from the list of compulsory subjects?

A. The paper on *Every Day Science* may very well be omitted, giving place to one on Indian History and Geography. The present test in *Every Day Science* has degenerated into mere cram of popular science manuals. The scope of the paper on *Present Day* may be slightly enlarged so as to include some elementary knowledge of current developments in science of a practical nature.

* Issued by the Public Service Commission.

4. Q. Do you think that either too few or too many marks are assigned to any of the compulsory subjects?

A. As has been pointed out already in answer to question 1, the marks for Vernacular Composition are excessive and may be reduced to one-half of the present number. If it is not decided to drop *Every Day Science* as a separate paper, the marks for the *viva voce* test may be reduced to 100. While appreciating the value of a personal examination of candidates like the *viva voce* test, 200 marks seem excessive, particularly in view of the inevitable part played by chance in the matter and the difficulty in maintaining an equal standard for all candidates.

5. Q. Do you think that a candidate in order to qualify should be required to obtain a minimum number of marks either (a) in each or (b) in any of the compulsory subjects or (c) in all the compulsory subjects combined?

A. There is no need to insist on candidates obtaining a minimum percentage of marks in each or in any of the compulsory subjects. It is however reasonable to demand that candidates should obtain a fairly high percentage of pass-marks (40 per cent., for instance) in all the compulsory subjects combined. In practice it will however be found that successful candidates generally satisfy the requirements.

6. Q. Do you think there is any ground for converting the compulsory paper on Vernacular language into a paper on Vernacular language and literature?

A. There is no ground for converting the compulsory paper on Vernacular language into a paper on Vernacular language and literature. Ability to express oneself with

freedom in the vernacular on a variety of subjects should be enough. A certain number of prose books in *modern* vernacular literature may however be prescribed for what is usually known as "non-detailed study" in Indian Universities. Some of the themes set for composition may be chosen from the subject-matter of the books which should serve mainly as models of elegant prose style.

7. Q. Do you think any alterations should be made in the list of Vernacular languages either by way of addition or subtraction? (Regulation 18).

A. From the standpoint of educational efficiency, the languages in the present list vary considerably in difficulty. But unfortunately the suggestion to omit any of them is ^{exa-}ght with trouble, as it will rouse the ^{exa-}ous opposition of the community or communities concerned.

8. Q. Do you think that the Vernacular languages vary greatly in difficulty? If so, have you any suggestions to make for meeting this objection so that all candidates shall take a vernacular on equal terms?

A. In the case of the vernaculars which are easier, or which do not have a sufficiently respectable body of good literature, the syllabus should be stiffened by the addition of questions on the history of the language or the people concerned.

9. Q. Would you make any alterations either by way of addition or subtraction to the list of optional subjects, especially having regard to the fact that some of the subjects are very seldom offered?

A. The following optional subjects may be omitted:—Law; Statistics; Geography; Physical Anthropology; Social Anthropology; Engineering; Agriculture. The re-

commendation is made not merely on the ground that some of the subjects are not usually taken by candidates but for other reasons as well. It is proposed to omit Law, for instance, because of its being one of the subjects studied during the period of probation in England, and Geography in view of the recommendation that Indian Geography should be one of the compulsory subjects. The inclusion of such highly technical subjects as Engineering and Agriculture among the optionals seems undesirable in view of the cultural requirements of the test contemplated for the Indian Civil Service.

It is worth consideration whether Sociology may not be added as one of the optional subjects in view of the great developments the study has made in recent years. Separate papers have begun to be set upon it already at least in some of the Indian Universities.

10. Q. Do you think that too many or too few marks are assigned to any of the optional subjects?

A. I have no complaint to make with regard to the present distribution of marks among the optional subjects, except however in the case of Engineering and Agriculture which subjects I have suggested for omission. If they are not dropped altogether, their marks should be reduced to two hundred each to bring them into line with the bulk of the optional subjects. There is no objection to the subjects being split up into sections with a suitable re-distribution of the present marks.

11. Q. Do you think that the distinction between the higher and lower branches of the scientific subjects 36-47 should be preserved; or should there be one set of papers in each of these subjects, covering both the elementary and the advanced portions of the

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subject (the total number of marks obtainable in each subject being 400, as at present)?

A. The distinction between the higher and lower branches of the scientific subjects may be abolished with advantage. It is an unnecessary complication not at all commensurate with the slight benefits accruing from the scheme. The papers overlap each other, to some extent, and the candidate who takes up a subject at the Indian Civil Service examination should be able to work up to the higher standard without much difficulty. The maximum of 400 marks may be allowed for each of the science-subjects if the distinction is abolished.

12. Q. Are you in favour of the present division of English literature into four periods, or would you prefer either that the periods should be differently arranged or that the paper should be on the whole of English Literature (within dates to be stated)?

A. In view of the vast scope of English literature, the present division into four periods is justifiable. But I would make the following suggestions:—

(i) The first period should start with Chaucer, though no detailed knowledge of Chaucerian grammar should be insisted upon. It may also stop with Milton.

(ii) The fourth period should be brought up to our own times, credit being given for knowledge of contemporary literature.

13. Q. Are you satisfied with the present division of Indian History into three periods?

A. I am satisfied with the present division of Indian History into three periods, but I would suggest their being named as 'Ancient India,' 'Mediæval India' and 'Modern India' or as 'The Hindu Period,' 'The Mohammedan Period' and 'The British

Period.' The periods may also be indicated by dates.

14. Q. Have you any observations to offer on the selection of authors mentioned in the paragraph headed English literature? Have you any other observations to offer on this paragraph?

A. I would suggest the following changes with regard to the authors prescribed for the various periods:

Period I: Add Chaucer and Ben Jonson; Drop Hobbes.

Period II: No change.

Period III: Add Jane Austen, Coleridge and Shelley.

Period IV: Add Browning, Stevenson, Swinburne, Meredith and Bernard Shaw; Drop H. G. Wells.

I am not stating the reasons for the above suggestions, but I am prepared to do so, if required.

Elementary questions on the general development of the history of the English language should also be included in the papers relating to the various periods.

15. Q. Have you any observations on Regulation 19 which requires candidates who take scientific subjects to have undergone laboratory training?

A. The condition insisted upon in Regulation 19 is a sound one, especially as there is no practical examination in the science subjects. If Geography is to continue as one of the optional subjects, it may be excluded from the list of subjects in which a certificate of one year's training is required.

16. Q. Have you any observations on the syllabus, pages 7—9? Are the paragraphs dealing with the different subjects sufficiently

precise to give candidates an adequate idea of the lines on which these subjects will be treated?

A. In view of the high importance of the examination, I would amplify the syllabuses. In the literature papers, for instance, I would mention the names of some of the important works of the authors of which a knowledge will be expected. This is the practice in the syllabuses of the Honours Courses of the Madras University.

17. Q. In particular is the paragraph under the heading "Natural Science" sufficiently definite?

A. I have no opinion to offer on this fragment.

18. Q. Generally do you think the present examination is well calculated (a) to discover the best type of candidate intellectually for the Indian Civil Service, and (b) to insure that the successful candidate possesses the indispensable minimum of knowledge requisite for the performance of his duties?

A. I think the present examination is, on the whole, well calculated to achieve the purpose for which it is intended.

19. Q. Do you consider that there are any features of the present examination which encourage cramming or produce other undesirable results?

A. Efforts may be made still further to discourage 'cramming' for the examination. It must be a constant direction to the examiners that the questions should be more a test of intelligence and grasp of the subjects, than of mere memory and special grinding for the examination. It is humanly impossible to eliminate the element of 'eram' from a competitive examination of this type, but no

vigilance can be too much for achieving the ideal. The present system does produce successful candidates sometimes whose qualifications do not seem to consist of anything beyond cramming books and passing examinations.

20. Q. Have you any further observations?

A. It is possible the type of successful candidate can be improved by the assignment of 100 marks each for (i) physical fitness and proficiency in games and (ii) for a good college record in extra-mural activities in the institution. Physical fitness should be tested by experts and college certificates can help in the assessment of proficiency in games as well as of the social and other activities of a student at college. Out of the total of 2,000 marks which will be the result if this suggestion is accepted, the assignment of 200 or ten per cent. to these subjects will not reduce the essentially intellectual value of the test. If these marks are grudged, the test may be included under the marks assigned for *viva voce*.

The process of application and nomination to appear at the examination may be made much simpler, even if the arrangements of quotas from the Presidency cannot be abolished altogether. It should be enough for applications to be sent through Principals of Colleges to the Secretary, Public Services Commission, without the candidates having to approach District Magistrates and Local Governments. The present process often results in unnecessary waste of time and energy and causes great anxiety to the prospective candidate in the earlier stages.

"MORE ABOUT THE REMAINDER THEOREM."

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THE basis for the Remainder Theorem in Algebra is the identity $\frac{f(x)}{x-a} = \phi(x) + \frac{R}{x-a}$, where $\phi(x)$ and R represent the quotient and remainder when $f(x)$ is divided by $(x-a)$. Since according to the Remainder Theorem, $R = f(a)$, this identity can be written in the form $\frac{f(x)}{x-a} = \phi(x) + \frac{f(a)}{x-a}$. It is easy to see that when x and a are given fractional numerical values, so that the values of $f(x)$ and $(x-a)$ are rendered fractional numbers, we cannot conceive of a quotient and remainder as a result of the division of the value of $f(x)$ by that of $(x-a)$; and when x and a are given integral numerical values, so that the values of $f(x)$ and $(x-a)$ become integers, it is quite possible to think of a quotient and remainder as a result of such division. But the values of $\phi(x)$ and $f(a)$ do not necessarily represent the quotient and remainder respectively in that division. Again the condition for divisibility in that division is not solely that $f(a)$ should be zero. These things were pointed out and illustrated in a previous article, "The Remainder Theorem" (in the May number of 1927). However, in such division, how the actual quotient and remainder are related to the values of $\phi(x)$ and $f(a)$, and what the full condition is for divisibility, are surely interesting questions worth investigating. This investigation and the consideration of its application will be taken up in this paper.

Let m represent a particular value given to x in the dividend $f(x)$, divisor $(x-a)$ and quotient $\phi(x)$. If m, a and the co-efficients of $f(x)$ are integers, there will be a quotient and remainder when $f(m)$ is divided by $(m-a)$. Let q_1 and r_1 be the quotient and remainder when $f(m)$ is

divided by $m-a$, and q_2 and r_2 those when $f(a)$ is divided by $m-a$. We are to investigate what relation exists between q_1 and q_2 and what between r_1 and r_2 . First of all, it is clear from the equation $\frac{f(m)}{m-a} = \phi(m) + \frac{f(a)}{m-a}$ that, as $\phi(m)$ is an integer and $f(a)$ may be zero or some integer, $f(m)$ is divisible by $(m-a)$ when $f(a)$ is either zero or a multiple of $(m-a)$. And the quotient q_1 in this case $= \phi(m) +$ the quotient q_2 . Now let us consider the case when there is an actual remainder. It is seen that the equation $\frac{f(m)}{m-a}$

$$= \phi(m) + \frac{f(a)}{m-a} \text{ may be put in the form } q_1 + \frac{r_1}{m-a} = \phi(m) + q_2 + \frac{r_2}{m-a},$$

being used with the notation indicated above. Now $f(m)$ and $f(a)$ may take any signs; so also r_1 and r_2 . If r_1 and r_2 are of the same sign — which is the case when $f(m)$ and $f(a)$ are of the same sign —

since $\frac{r_1}{m-a}$ and $\frac{r_2}{m-a}$ are both proper fractions with the same sign, these fractions from a consideration of their position in the equation are seen to be equal, and we get $r_1 = r_2$, and $q_1 = \phi(m) + q_2$. In other words, the remainder when $f(m)$ is divided by $(m-a)$ is the same as that when $f(a)$ is divided by $(m-a)$, and the quotient in that division $= \phi(m) +$ the quotient, if any, in the division of $f(a)$ by $(m-a)$ — provided that $f(m)$ and $f(a)$ have like signs. Again when r_1 and r_2 are of opposite signs — which is the case when $f(m)$ and $f(a)$ are of opposite signs — it is clear that the proper fractions $\frac{r_1}{m-a}$

and $\frac{r_2}{m-a}$ have opposite signs and are not equal; but we can make them have the same sign by removing ± 1 from q_2 and adding it to $\frac{r_2}{m-a}$, and

then we get the resulting fraction equal to $\frac{r_1}{m-a}$. Therefore in this case $r_1 = r_2 \pm (m-a)$ according as r_2 and $(m-a)$ have opposite signs or the same sign, and the quotient $q_1 = \phi(m) + q_2 \mp 1$.

In other words when $f(m)$ and $f(a)$ have opposite signs, the remainder in the division of $f(m)$ by $(m-a)$ is obtained by adding $(m-a)$ to, or subtracting it from, the remainder in the division of $f(a)$ by $(m-a)$, according as the latter remainder and $(m-a)$ have opposite signs or the same sign; and the quotient is obtained by subtracting unity from, or adding unity to, the sum of $\phi(m)$ and the quotient in the division of $f(a)$ by $(m-a)$.

Now to illustrate all the above results, we shall take $f(x)$ to be $9x^3 + 8x^2 + 7x + 2$ and divisor $x-2$. Then $\phi(x) = 9x^2 + 26x + 59$ and $f(2) = 120$. Since $f(2)$ or 120 is a multiple of 10-2 or 8, $f(10)$ namely 9872 is divisible by 8, and the quotient in this division $= 1219$ [which is $\phi(10) + 15$ [which is the quotient of the division of $f(2)$ by 8] i.e., 1234, which can be seen to be true on verification. Again taking $f(x)$ to be $9x^3 + 8x^2 + 7x + 5$, and divisor $x-2$, we have $\phi(x) = 9x^2 + 26x + 59$ and $f(2) = 123$. As $f(10)$ namely 9875 and $f(2)$ namely 123 are of the same sign, the remainder in the division of $f(10)$ or 9875 by 10-2 or 8 is 3, the remainder in the division of $f(2)$ or 123 by 8; and the quotient in that division $= 1219$ [which is $\phi(10) + 15$ [which is the quotient of the division of $f(2)$ by 8] i.e., 1234, which truths verification will make clear. Again taking $f(x)$ to be $9x^3 + 8x^2 + 7x + 5$ and divisor $x+2$, since $f(10)$ namely 9875 and $f(-2)$ namely -49 are of opposite signs, the remainder when $f(10)$ or 9875 is divided by 10-(-2) or 12 $= -1$ [the remainder of the division of -49 by 12] + 12 i.e., 11; and the quotient $= 822$ [which is $\phi(10) + (-4)$ [the quotient of the division of $f(-2)$ by 12] - 1 i.e., 822, which truths are confirmed by verification.

The above principles can best and most usefully be applied in proving the tests for divisibility of any number by 9, 3, 11 and in getting an easy method of determining the remainders when any number is divided by 9, 3, 11. How? Any number containing n digits $d_0, d_1, d_2, \dots, d_{n-2},$

d_{n-1} from right to left is $f(10)$ where $f(x)$ is $d_0 + d_1x + d_2x^2 + \dots + d_{n-2}x^{n-2} + d_{n-1}x^{n-1}$.

Now from the identity $\frac{f(x)}{x-1} = \phi(x) + \frac{f(1)}{x-1}$

we have the equation $\frac{f(10)}{10-1} = \phi(10) + \frac{f(1)}{10-1}$

i.e., $\frac{f(10)}{9} = \phi(10) + \frac{f(1)}{9}$. Therefore $f(10)$

is divisible by 9 when $f(1)$ is either zero or a multiple of 9, according to the principle established above. But as $f(1)$ is the sum of the digits of the number, it cannot be zero. Therefore $f(10)$ is divisible by 9, when $f(1)$ is a multiple of 9. In other words a number is divisible by 9 when the sum of its digits is a multiple of 9. And as $f(10)$ and $f(1)$ are both positive, the remainder when $f(10)$ is divided by 9 is the same as that when $f(1)$ is divided by 9. In other words the remainder when a number is divided by 9 is the same as that when the sum of its digits is divided by 9. Next

from the above equation we get $\frac{f(10)}{3} = 3\phi(10)$

+ $\frac{f(1)}{3}$. Therefore $f(10)$ is divisible by 3 if $f(1)$

is divisible by 3 [the other alternative condition, viz. $f(1)=0$, being inadmissible]. In other words a number is divisible by 3, if the sum of its digits is a multiple of 3. And as $f(10)$ and $f(1)$ are both positive, the remainder when $f(10)$ is divided by 3 is the same as that when $f(1)$ is divided by 3. In other words the remainder when a number is divided by 3 is the same as that when the sum of its digits is divided by 3. Again we have the

equation $\frac{f(10)}{11} = \phi(10) + \frac{f(-1)}{11}$ as before.

Now $f(10)$ is divisible by 11 when $f(-1)$ is either zero or a multiple of 11. As $f(-1)$ means the sum of the digits of the number in the odd places (from the right) minus the sum of the digits in the even places, $f(-1)$ may be zero, positive or negative according as the two sums are equal, the former sum is greater than the latter sum, or the former sum is less than the latter sum. Therefore a number is divisible by 11, when the sum of its

digits in the odd places (from the right) = that of the digits in the even places, or when the difference between these two sums is a multiple of 11. As for the remainder when $f(10)$ is divided by 11, it depends upon the sign of $f(-1)$. If $f(-1)$ is positive, since $f(10)$ is positive, the remainder when $f(10)$ is divided by 11 is the same as that when $f(-1)$ is divided by 11. In other words, if the sum of the digits of a number in the odd places (from the right) exceeds that of the digits in the even places, the remainder when that number is divided by 11 is the same as that when the difference of the two sums is divided by 11. If $f(-1)$ is negative, since $f(10)$ is positive the remainder when $f(10)$ is divided by 11 is obtained by adding 11 to the remainder

(with its sign) obtained by dividing $f(-1)$ by 11. In other words if the sum of the digits in the odd places (from the right) in a number is less than that of the digits in even places, the remainder when that number is divided by 11 is obtained by adding 11 to the remainder (with its sign) when the difference between the first and second sums is divided by 11. This last case may need an illustration to make it quite clear. Suppose the given number is 18092; then the difference between the sum of the digits in the odd places and that of the digits in the even places is $8 - 17$, i.e., -9 . Therefore, since the remainder when -9 is divided by 11 is -2 , the remainder when 18092 is divided by 11 is $-2 + 11$, i.e., 9, which is easily seen to be true, if verified.

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THE EASTLAND SPORTS WORKS, SIALKOT CITY.

ADMINISTRATION.

AN ADDRESS* BY HIS EXCELLENCY
SIR HARCOURT BUTLER, G.C.I.E., K.C.S.I.
Governor of Burma.

INTRODUCTORY.

IT has occurred to me, gentlemen, that simple lectures on the administration of the country may be interesting and useful to students of this University. Our future administrators will be drawn in large numbers from your ranks, and you will take part in the great scheme of reform declared and inaugurated by the Government of India Act. Administration varies from place to place. In process of time and under the hammers of experience, by the application of reforming zeal to human stupidity and human error, a great mass of law and regulation has grown up with reference to local conditions in different countries and in different provinces, but the main principles of administration and the functions of the administrative machine must in essentials be the same everywhere. The legislature makes laws. The administration carries them out. Every government has to collect its revenue, to preserve law and order, to protect private rights, to develop the economic and social life of the people, and to maintain records and statistics. For these purposes every government has to function through public services and a regular financial system. In no State, except in petty City States, has it ever been possible for the people themselves to conduct the administration. Nor have the results in petty City States been encouraging. In Athens the people met in the market place, decided cases, passed laws, deposed officers and re-

called generals; but in the verdict of Lord Acton, the great Liberal historian, they ruined their city.†

I begin then with the public services. Under early and autocratic forms of government the public services consisted of personal adherents to the autocrat, or of individuals whom the autocrat desired to conciliate or get out of the way. There were exceptions, no doubt, but on the whole, it is true that under such forms of government little regard was paid to efficiency or to the rights of the people as we regard them nowadays. The officials were the representatives of the autocrats removable at will and with little regular remuneration; they fed on the land and the people and they made what they could of their period of authority which was often brief. Such was the system generally prevailing in Burma before the British came. The term *myosa* means "eater of a town." Such is the system that I have seen followed in certain backward Native States in India. Some favourite secures the ear of his master for a time, then he is driven from

† "They ruined their city by attempting to conduct war by debate in the market place. Like the French Republic, they put their unsuccessful commanders to death. They treated their dependencies with such injustice that they lost their maritime Empire. They plundered the rich until the rich conspired with the public enemy, and they crowned their guilt by the martyrdom of Socrates."—Lord Acton: *Freedom in Antiquity*, page 12.

"The repentance of the Athenians came too late to save the Republic. But the lesson of their experience endures for all times, for it teaches that government by the whole people, being the government of the most numerous and most powerful class, is an evil of the same nature as unmixed monarchy, and requires, for nearly the same reasons, institutions that shall protect it against itself, and shall uphold the permanent reign of law against arbitrary revolutions of opinion."—page 19.

* Delivered to the Senior Students of the Rangoon University.

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power. The British Government has built up more modern ideas of administration. Independent services have been organized on impersonal lines with a view to efficiency; and the object set before them is the welfare of the people. To this end they have been given a clear position and definite rights, independent of political and external influences. A public servant, under the present system, once he is appointed, is entitled to service on a reasonable salary with prospects of promotion and a pension on retirement unless or until he has proved himself unfit. He cannot be removed except for specific reasons, on full enquiry and after formal charges have been framed against him. This is the great difference between public and private service. Private service offers larger rewards to the successful few, but in private service a man is liable to removal after due notice at the will of the employer. He has no cause of complaint and no remedy. Private employers are often impatient at the retention by the State of obviously inefficient public servants. But it has been found to be greatly for the public benefit in the long run that the public services should have reasonable salaries and a sense of security and that without these safeguards, high traditions of service, so important to the community, will not grow up. Human nature, however, is human nature. Power sometimes is abused. Reasonable salaries and a sense of security often lead in the case of individuals to low standards of work. Hence the paramount and permanent importance of inspection and supervision. It is not too much to say that inspection and supervision by experienced officers are the life of the public services. The tendency of progressive communities is to improve and strengthen the position of these services and

to increase the supervision of them. With an increase in the competence and activity of the legislature, there is need for an increase in the quality and specialised capacity of the administration. Personality is still a most powerful force, but in this as in other departments of life scientific organization has taken the place of personal methods. One of the most interesting chapters in the history of the Roman Empire is that which deals with the growth and organization of its public services.

I will now give you a sketch of the organization of public services. At the bottom is an individual who is in direct communication with the public in a defined local area which is the unit of administration. He may be, but he need not be, an official. In the general administration of Burma the unit of administration is the headman's village-tract which consists of one or more villages. The headman is not an official; he is the representative of his tract appointed by the Deputy Commissioner after ascertaining the wishes of the people in the tract; he receives a remuneration in the form of a percentage on the land revenue and the taxes which he collects for Government and he has certain privileges as well as duties, but he has no regular salary. He is appointed for life but is removable under certain conditions. Above the headman is the township officer. Above him is the sub-divisional officer. Above him again is the Deputy Commissioner. Above him is the Commissioner or the head of a department. Above them all is the Local Government. An order of the Government is remitted through the various grades down to the headman. Each of them has to know what order has been passed. Information is collected through the same channels. The

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headman sends it to the township officer, the township officer compiles it for his township and sends it to the sub-divisional officer who compiles it for his sub-division and forwards it to the Deputy Commissioner who compiles it for his district. The Commissioner compiles it for his division and the Local Government or the head of a department compiles it for the province. Records are kept of all orders passed and of all information collected, so that it is possible at any time to ascertain the facts. Each link in the chain is under the control and inspection of the link next above it.

FINANCIAL SYSTEM.

Sound finance is the foundation of every sound system of administration. Sound finance is only obtained by regular methods and adherence to financial rule. The basis of everything is the annual budget. This is made up of estimates of the revenue of the year and of the expenditure of the year. For convenience the financial year in Burma as in India begins on the 1st April in each calendar year and ends on the 31st March of the following calendar year. It is necessary to have a fixed period, so that the accounts may be closed at the end of the financial year and a fresh start be made. The provincial budget is made up of a series of estimates for every revenue receiving and spending authority or unit of administration. One and all are bound by the same rules. The estimates of revenue have to be cautiously framed because they refer to the future. Owing to bad harvests the land revenue may not be collected to the extent estimated, or the excise revenue may fall short. Owing to weakness of demand for timber, or to a bad floating season the forest revenue may not come in full, and so on. The estimates of

expenditure are rigorously fixed and no spending authority can incur expenditure which is not sanctioned and provided for in the budget. If expenditure not so provided and sanctioned becomes urgently necessary, provision is made by supplementary grants sanctioned by the authority which has sanctioned the budget. In the year 1923-24 the actual receipts were a crore of rupees less than the estimated figure and solvency was only maintained by keeping expenditure rigorously down.

The budget represents the activities of the administration during the year, and good administration means and depends on good framing of estimates. The ultimate financial control rests with the Legislative Council, except in certain matters excluded from its powers by law. The ordinary financial control rests with the Finance Department assisted by the Finance Committee, and an advisory body elected from the members of the Legislative Council. All expenditure as it occurs, is checked by an independent authority representing the Audit department, presided over by the Accountant-General. The necessity for a high and independent auditing authority is recognized by every civilised Government. Everyone is bound by the rules and the audit authority has very large powers. He can object to the payment of money if it is unauthorised or if he considers it improper and can demand the recovery of money if a payment not due has been wrongly made. The final check over expenditure is maintained by the Legislative Council through the agency of the Public Accounts Committee which scrutinises the annual audit and appropriation accounts of the province that are prepared by the Accountant-General, and deals with other matters referred to it by the Finance Department.

The whole financial system has become very elaborate by the accumulation of rules which have grown up to cover individual cases as they have arisen, but the great canon of sound finance remains as simple as it was stated by Mr. Micawber in Dickens's great novel "David Copperfield": "that if a man had twenty pounds a year for his income and spent nineteen pounds, nineteen shillings and six pence, he would be happy but that if he spent twenty pounds one he would be miserable." This is true for States as for individuals and is never to be forgotten. Another canon is that everything has to be paid for, and that additions to expenditure must be met by savings or additions to revenue. A third canon is that money allotted for one object cannot be diverted to another without the sanction of proper authority. Some forms of expenditure are productive, i.e., they lead to an increase in revenue. Expenditure on excise establishment, for example, stops smuggling and adds to excise receipts. The same may be said of much of the expenditure in other revenue-making departments. For obvious reasons, productive expenditure has much to recommend it. It is scarcely necessary to add that if the expenditure is greater than the revenue, that difference has to be made good by drawing on the balances, or borrowing or fresh taxation.

The most important sources of revenue are land revenue, forests, excise and stamps. In backward countries most of the revenue comes from the land but as the countries are developed, the proportion of the total revenue arising from the land decreases relatively to other receipts. In Burma land revenue still provides about half of the total provincial revenue of the year. I will now give you

some account of land revenue and forests, and of the spending departments that fall under the description of law and order.

LAND REVENUE.

A considerable literature has grown up over the taxing of the land. Opinions still differ—neither the Joint Committee on the Government of India Bill nor the recent Indian Taxation Committee could decide—whether land revenue is a tax or a form of rent. Only experts can understand some questions that have been raised on land valuation and taxation and the language in which they are expressed. But the underlying principles are the same everywhere. The rulers of States want money. They regard the land as their own or they see in it the easiest thing to raise money from. It is always there; it cannot run away. If one person does not want to pay for it, another can usually be found. Whether the rulers claim to own the land or not, they can always take money or produce from the occupiers of the land. The payments have borne some relation to the outturn of the land from the highest antiquity. The Ptolemies who ruled in Egypt got more from the land than most ancient rulers. Under the Roman Empire an elaborate system of land valuation* and taxation was worked out as part of the Roman census. It seems probable that this system has come down to Indian and Burman administrators through the Caliphs of Baghdad and the

* In Syria, for example, there was something like a soil unit system, as it is now called. The different sources of revenue were reduced to a unit of assessment, caput or jugum, on which a certain sum or rate was fixed. In Syria the unit of assessment was 5 acres of vineyard, 20 acres of first class arable land, 40 acres of second class or 60 acres of third class, or again 225 olive plants of the first or 450 of the second class.

Mogul Emperors. The process of valuation now is as follows. Each village has a map showing all the fields that are cultivated in it. Those fields are numbered in the map and the areas are entered opposite their numbers in a field book or register. Every year this register is written up to show the occupier of each numbered field and the crops grown in it, besides other particulars. This is an annual performance carried out by the Land Records Department. At fixed intervals of time a revenue settlement takes place, in Burma generally every twenty years. Where necessary the maps and registers are brought up-to-date by a special revision called a re-survey. Then the Settlement Officer comes along and marks on the map the different classes of soil. For each of these he fixes a rate per acre derived from experiments and enquiries as to the outturn of the different classes. The rate varies not only according to the soil but also according as the land is irrigated, or otherwise advantageously placed. Fields round the village site have a special value as being easily reached for cultivation or weeding at all hours of the day and because they collect much natural manure. The holding of an occupier consists of several numbered fields and the revenue that he has to pay is the total of the amount fixed on those fields. The total due on the sum of the holdings of a village is the land revenue of the village. This is collected by the village headman who gets a percentage of the amount collected for his trouble; for the whole province it averages about six per cent. It is all really very simple when stripped of technicalities and jargon. The great importance of having accurate maps and records of the fields need hardly be emphasised. The land revenue, half the total revenue of the province, depends

upon it. The land records may serve another purpose of great value to society. They may record private rights in land, an entry of the transfer of such rights being made in a register of mutations.

FORESTS.

The forests of Burma are more extensive in area than the forests of any other province in India. Indeed, they cover more ground than all the other forests of the Indian Empire put together. For our purposes they may be divided into two classes—reserved forests over 30,000 square miles, and forests not reserved some 117,000 square miles. Both classes are the property of the State. The reserved forests are managed by the State with a view to the protection of the forests and the raising of revenue. They are more or less closed to the public. No rights are allowed to accrue in them except such as have been decided by competent authority after local enquiry, such as extraction of produce for domestic use or in certain cases shifting cultivation. The unreserved forests subject to restrictions in the matter of extracting certain kinds of trees and of removing timber for trade purposes are at the disposal of the local inhabitants. The Burma forests are the most productive in the empire. For an annual expenditure of about a crore of rupees they yield a revenue of about two crores. The bulk of the forest revenue comes from the sale of timber. There are minor forest receipts, such as the sale of bamboos, of fuel, of lac, but timber is the main concern.

The chief demand for timber for export is for teak. Seventy per cent. of the revenue of the department comes from teak. Teak is still the best wood known for building purposes and for ships. It lasts longer than other woods because it is better.

in quality, better seasoned, and better able to resist the ravages of insect pests. Burma is the greatest source of teak supply in the world. The best flat lands have been given up to paddy cultivation and bulk of the teak forest is at present in the hills. The teak trees grow mixed with other species and are spread over large areas. Forest work would be simple and cheap if the teak trees grew conveniently close together. This is not the case; the teak trees grow far apart, often not one to the acre, three to the acre is exceptionally close, and they are often found in inaccessible places where extraction and haulage are beset by many difficulties. Teak trees are too heavy to float until the sap has been taken out of them. The big trees are marked for girdling with a view to the removal of sap. The standard for girdling is a girth of 6½ feet breast high in a dry forest and 7½ feet breast high in a moist forest. Girdling means that they are ringed near the base with a cut some three inches deep round the trunk, so as to expose three inches of the heart wood. The girdling cuts off the supply of sap to the trunk and the timber seasons naturally. When a teak tree has been girdled for about three years it is free from sap and is cut down and dragged by elephants or buffaloes to the nearest stream by which it floats during the rains to the Irrawaddy, the Salween or other big river. There it is joined to others and makes a raft which is piloted down to a timber depot. The rafts on the rivers are one of the most familiar scenes of Burman life. The logs have to be followed down the streams as they often get jammed in narrow or shallow places; and they then have to be dislodged and pushed on by elephants or buffaloes. Altogether it may easily take five years for a teak log to reach a timber depot. These operations

entail very heavy expenditure and constant supervision. Each log has to be cut to the right length, and a drag hole cut in it, so as to take a chain for haulage. It has been found desirable to leave most of the work of extraction to the big commercial firms, who pay royalties to Government for the logs which they cut. Extraction by Government is now limited to a small area.

Attempts have been made for several years past to put hard woods, other than teak, upon the market, but so far there is little demand for them outside Burma. Inside Burma the trade output of hard woods is now as large as that of teak and much is cut in unreserved forests for building which never comes on the market at all. Very few of the hard wood trees are light enough to float, so haulage will always be a difficulty as the markets are greatly dispersed. When cut, the wood is not stored sufficiently long to be seasoned. Experiments are being made at the forest depot at Rangoon in artificial seasoning of hard woods, but for commercial purposes seasoning must be got by keeping large stocks.

One of the principal functions of the Forest Department is to make surveys, so as to work out scientific plans for felling, re-planting, protecting and opening up the different forest areas over a period of years. These are called working plans but they can only be prepared after maps have been provided by the Survey of India. Some very successful surveys have recently been made from the air, a form of aerial work in which Burma has been a pioneer. Before a working plan can be drawn up, it is necessary to count the number of trees of valuable kinds over a certain girth usually 8 feet on a portion of the forest area, and to prepare a map called the

stock map showing where the different species are to be found. Not long ago some stock maps were made in Tenasserim from the air with considerable success. In the endeavour to find a way through for logs in floating streams from the Tharrawaddy forests to the Myittha river, very successful methods of river training have been developed and much land has been reclaimed by controlling the deposit of silt from these rivers. The department has to make buildings for its staff, villages for its workers, and roads for them and for transporting produce. The big firms have to do the same.

Meanwhile, re-planting or what is called regeneration work, is going on steadily, and valuable assets are being built up for future generations. It is slow work especially with teak. The girth of a teak tree in the natural forest is about 3 feet at 50 years of age, 5 feet at 100 years and 7 feet at 150 years. It takes about 250 years to reach a girth of 12 feet. In plantations it is hoped to grow trees big enough to fell in 80 to 100 years because they can be looked after and other trees and bamboos can be cut down if they are suppressing the teak. In natural forest at the outside three trees to the acre are ready for felling every thirty years, or about ten trees a century. Thirty years is now the felling cycle which sufficiently meets the demands of the forests for rest. By making plantations it is hoped to grow, under the most favourable conditions as to soil and climate, as many as fifty trees to the acre large enough to fell every century, besides a number of poles and posts. These plantations are in accessible places. They commenced in 1856 and now cover over 100,000 acres.

The science of forestry is still in its youth. Forest officers are wringing out the secrets of

Nature, learning her ways and how to improve them. In no other department does one come into such close touch with Nature, her strife, her growth and her peace, her majesty and her silence, and all the mute confidences of the vegetable and animal kingdom. And all the time the forest officer has to keep in close relation with the markets of the busy world. Forest service is not at present popular with young Burmans. I commend to you a career honourable and uplifting and of great value to your country.

LAW AND ORDER.

The primary function of an administrative system is the protection of the lives and the property of the people. As societies advance, the diseases of society increase, and this seems to be specially true of the social disease of crime. The criminal classes share the advantages of education and improved methods of communication, and there seems to be a constant tendency to swell their numbers. Now the prosperity and happiness of the people depend largely on the efficiency with which crime is handled by the three departments of police, justice and prisons. The main business of the police is to prevent the commission of crime, or, when crime has been committed, to catch the criminal and bring him before the judiciary for trial. The main business of the judiciary is to try the persons who are brought before them by the police or on the complaint of private individuals. The main business of the prisons is to carry out the sentences passed by the judiciary upon the individuals who are convicted by them.

POLICE.

The police force is distributed in police stations fixed at central points. The advan-

tages of concentration are that there can be more control, more efficiency, and better discipline. Small outposts are destructive of discipline and efficiency. According to modern ideas the prevention of crime is the most important branch of police work. It is naturally the branch of which the public know least. It covers the watching, or as it is called the surveillance, of known or suspected criminals and the continuous record of their movements. A modern surveillance system has been laid down for Burma and arrangements are being made to put it into practice. The old system of constables going round their circles on beats has been superseded by a more efficient system of visiting, reporting, and record by a special and more intelligent agency. The police must, however, depend on prompt information and in this the public can give great assistance. Again there are provisions of the law by which the magistracy, if satisfied that the known or watched criminals are a danger to society, may call upon them to furnish security for good behaviour and, in the event of their failing to provide this, may order their detention in jail for short periods. A magistrate may also order habitual offenders to reside in a certain area if satisfied that they are habitual offenders. This also is important preventive work as it removes criminals from the opportunity of preying on society.

The work of detection of crime and capture of the criminal has appealed to the imagination of man from comparatively early times. The really good detective is probably, like the poet, born not made, but much may be done to improve detection by modern methods of training and study. These also are being provided. There are many other functions of the police who go their rounds or are on

duty at fixed points, or are available at police stations when called for to keep the peace or prevent crime. The police force in Burma has recently been re-organized with a view to having a smaller and more concentrated force better paid. It wants young men of character and good ability to come in as officers or sub-inspectors. It is an honourable service and in the last few months has shown that it has its share of heroes whose gallant deeds are such that all Burma should be proud of them and honour them. Thanks to the efforts of all concerned there has in the last few months been an appreciable decrease of crime. But the police here as in other countries must depend on the co-operation of the public, in giving them information and in coming forward to give evidence. The police are in for much abuse; they have to do most unpleasant things; but whenever a police station is closed there is a strong protest from the people of the neighbourhood. Very many such complaints have been received in connection with the recent re-organization which reduced the number of police stations from 462 to 295 and of outposts from 106 to 11. Thirteen closed police stations are about to be re-opened. There is an old saying, and a very wise one, that every people deserves its police. This means that the police are not better nor worse than the people from whose ranks they come, and that they depend in their work at every turn, on the help of the people themselves. It is the duty of every individual to assist the police. In England such assistance has become a habit. In India and Burma it is almost of rare occurrence.

THE JUDICIARY.

Court houses exist all over the province in which for several hours every day judges and magistrates sit and listen to complaints and

adjudicate cases. Justice is administered in public and with the help of a legal profession. One of the strongest ties of the British Empire is its system of law and justice, watched over by the Judicial Committee of the Privy Council. In civil law the rights of man as against man and of man as against Government are maintained with scrupulous care. In criminal law elaborate provisions exist to secure a fair trial to persons charged with crimes, the basis of all criminal work being the assumption that a man must be considered innocent until he is proved guilty. High standards of evidence are insisted on. Very careful procedure has been laid down. Some people think, or say, that the standards of evidence and the system of procedure are not suited to a province like Burma. But I do not think that any responsible person would advocate that Burma should have lower standards of justice than other parts of the Empire. One of the great principles of British justice is the independence of the judicial tribunals. The judicial system of this province is under the control of the Honourable Chief Justice and Honourable Judges of the High Court and they spare no effort to maintain high standards and to strengthen the judiciary. In this they are assisted by the legal profession. The constant improvement of the legal profession and of the judiciary are of the first rate importance to the State and the people. Some 75,000 civil cases and 125,000 criminal cases are decided every year. These must affect, including counsel, at least a million people.

PRISONS.

The horrors of prisons in old times have been the subject of much literature. Reform and romance have played their part. The modern jail exacts discipline and hard work under conditions of health and food superior to those of the general population, but it also aims at moral regeneration or the reform of

the prisoner. Experiments are being made in many directions, and conditions of detention and work are being adjusted to newer ideas. Not only has there been in recent years an important Jail Commission, but here in Burma was secured the services of one of His Majesty's Commissioners of Prisons, Mr. Paterson, to advise us on important questions of jail policy and administration. He gave some lectures on the subject and has written a report. There are eight Central Jails and twenty-three District Jails in the province. The former are used for long-term, the latter for short-term, prisoners. In both classes of jails the prisoners are looked after to a large extent by their own officers selected for good conduct. In Burma separate jails have been reserved for the confinement of habitual offenders. A school for jailors has recently been started in the province, the first of its kind in India. One of the interesting experiments now being made is the employment of prisoners on work of a public nature outside the jails. Juvenile offenders are now being separately treated. Punishment, deterrence and reform are the three chief objects of imprisonment. In the past the main emphasis was laid on punishment; in the present the main emphasis is laid on reform. The old idea of punishment as an eye for an eye and a tooth for a tooth has given way to the more humane ideas of correction and restoration to society.

GENERAL.

Time does not permit me to deal with other important departments of administration. Some of these are now called nation-building or beneficent departments. But these terms can be applied justly to all departments of the administration. The word administration means service. It is in the hope and belief, gentlemen, that you will stand forward and serve your country that I have come to lecture to you.—*The Teachers' Friend*, Mandalay: June 1927.

A PROPOSED SCHEME OF PHYSICAL EDUCATION FOR COLLEGES OF MADRAS UNIVERSITY.

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I. DEFINITION AND PRINCIPLES.

PHYSICAL education is essentially health education. It deals with motor or neuro-muscular activities, so directed and controlled as to preserve and develop organic vigour or vitality.

Not only does wisely organised physical education concern itself with all phases of physical activity, but with health instruction and the observance of those laws necessary to maintain physical, mental, and moral vigour.

Effective physical training programmes are based upon the following principles:—

First, that health is fundamental to full development and that, during the entire life of the individual, health is dependent upon the proper functioning of the motor apparatus, its work differing in amount and character according to age and condition.

Second, that the full development of character and sturdy manhood depends upon proper and adequate physical training, especially during the period of youth and young manhood.

Third, that fundamental physical and mental differences are recognised in the individual in the various stages of his development, and that at these times the individual is peculiarly susceptible to influences potent in the formation of character and that

properly conducted physical activities afford a most powerful means for controlling the same.

Fourth, that physical training affords a means for overcoming those subtle and vicious tendencies of modern life developed through idle drifting, by providing healthful amusement and recreation for young men.

Fifth, that physical training is a potent factor as a deterrent to the breaking down of the moral standards of men, brought about by lowered efficiency in vital stamina through fatigue and preventable disease.

It is unfortunate that the general public thinks of physical education as having to do primarily with formal calisthenics or 'drill' and gymnastics. The student of physical education is being trained in progressive institutions to-day along other lines than the 'day's order,' and with material more related to living than 'giant swings.'

There is a place and need for 'drill' and gymnastics in a programme of physical training, but such activities should not occupy the entire stage. The programme should be built upon the natural instinctive play activities, and thus, through play, games, and athletics wisely organised and properly directed, we can not only build healthy and symmetrical bodies, but valuable lessons of sportsmanship may also be taught. The programme should also include health instruction; the aim of the entire syllabus being to really fit the individual for an efficient and happy life.

II. GENERAL SCHEME.

It is my contention that a scheme of physical education somewhat as follows should be introduced into every school and college in India. Any scheme worth while will attempt

to cope with the problems of physical weakness, low vitality, poor posture, under-nourishment, sickness and disease, high death-rate, short average length of life, poor sportsmanship, lack of hardihood, lack of self-discipline and of self-control, etc. Briefly outlined, my proposed scheme of physical education would include—

1. A medical examination of all students, to eliminate those who might endanger the health and morals of fellow-students.

2. Medical and physical examinations, to select remedial cases.

3. Follow-up work, advice, and remedial work for 1 and 2.

4. Special classes and individual attention, to correct mal-posture and deformities.

5. Physical training classes for the general welfare of the entire student body.

6. Health instruction for the entire student body, and opportunity for individual consultation and advice.

7. Organised, supervised and directed games and athletics for those physically fit and athletically able to participate on school or college teams.

8. Well organised, supervised and directed play, games and athletics for those not able to participate on representative school or college teams.

9. Training classes to develop student leaders to assist in carrying out such a worthwhile programme.

10. Health instruction and physical activities for staff members, and enlisting their active co-operation in promoting activities for students.

11. Credit to be given for physical training, but the student to be required to pass

examinations on the Health Instruction courses and be able to pass a certain standard of physical efficiency.

12. Close co-operation with Public Health Departments.

13. A Physical Department organisation, comprised of staff and student representatives, working with a qualified Physical Director, to conduct a broad programme of physical and health education.

III. AIMS OF THE SCHEME.

The aims of physical education may, in general, be summarised as follows:—

1. The promotion of normal growth and organic development:—

- (a) to conserve health;
- (b) to provide a fair degree of strength and endurance;
- (c) to secure an erect and self-respecting carriage of the body;
- (d) to develop the neuro-muscular control required for prompt and accurate response and graceful and effective movements.

2. The development of qualities relating to society:—

- (a) acquisition of habits, obedience, subordination, self-sacrifice, co-operation, friendliness;
- (b) loyalty, patriotism;
- (c) capacity for leadership;
- (d) proper spirit toward victory and defeat;
- (e) spirit of fair play, sportsmanship, civic pride and honesty.

3. Development of those qualities directly related to the individual and indirectly related to the community. These qualities have

a mental and moral value, and are derived from active games and athletics properly supervised : self-confidence, self-control, mental and moral poise, good spirits, alertness, resourcefulness, decision, perseverance, courage, aggressiveness, initiative.

4. To engender in youth an intelligent and healthful interest that shall lead to the life-long practice of forms of active exercise which favour a continued high level of physical and of stimulating social contact.

5. To instruct youth in the science of health, the means by which it may be secured, and the formation in early life of those habits tending toward its conservation.

IV. TYPE OF PHYSICAL DIRECTOR REQUIRED.

It becomes at once apparent that such a scheme is impossible, and that such aims cannot be realised, if we are content to entrust the promotion of physical activities to uneducated, unresourceful, inefficient 'drill-masters,' as has been the custom in India. Under such an arrangement nothing of a constructive nature is accomplished, and we are not justified in giving the name 'physical training' to the work which is attempted.

The profession of physical education is both a science and an art, and, like any other profession, it calls for Directors with very high educational qualifications and with special technical training. We need to recruit for this work men who are college graduates, and to give them one or more years of special technical training to ensure efficient service.

The Director of Physical Education of to-day must be a specialist in man-building. His material is living human bodies. This material comes to him in various conditions. He

must deal with young and immature boys; with healthy young men; with middle-aged men of vigour; with others in the early stage of senility, or suffering with bodily weakness and incipient disease. From this mass of material he must be able to select his legitimate work. He is required to know who should be sent to a physician and who to the gymnasium or play-ground. Furthermore, the Physical Director must have the ability to give these classes of people who belong in his sphere of activity such advice and training as will improve their physical condition and enable them to get the most out of life in all its aspects.

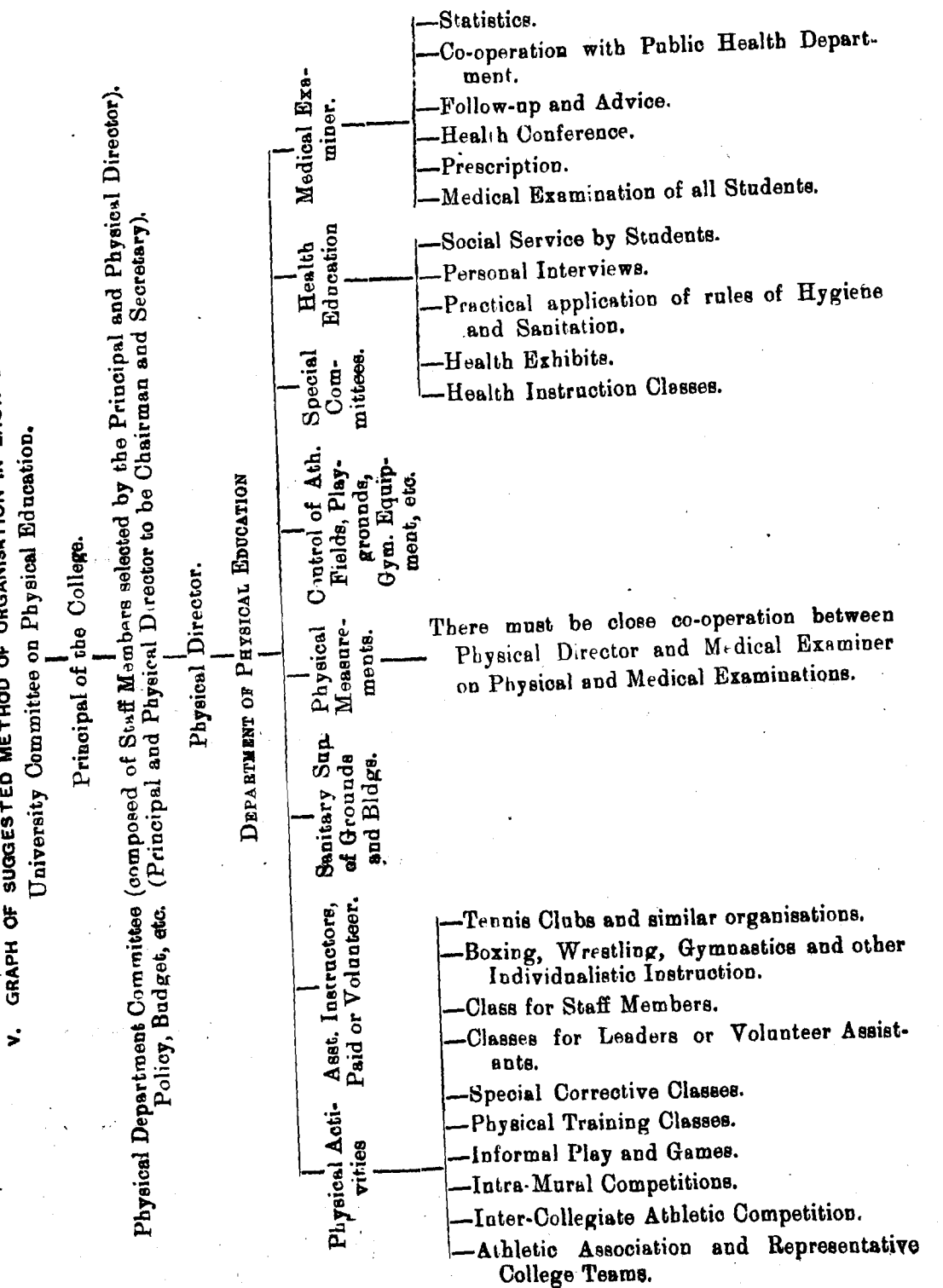
Further than this, he must deal with the 'preventive side of medicine,' and must in every way be well enough equipped and informed to deal wisely with physical and social welfare work in all its aspects.

His equipment must include, then, not only a thorough knowledge and practice of the technique of all forms of physical exercise, athletics, and games, in order to help individuals to build efficient human machines and in order to develop character through wholesome, wisely-directed recreation and play; but the would-be Physical Director must study carefully the structure and function of the various parts of the human machine, their mode of development from youth to manhood, and various allied technical subjects, in order that he may be able to advise, promote and direct properly.

The Physical Directorship is a worthy, useful, and most necessary profession, demanding of those who would serve in it ranks the following qualifications :—

1. Good moral character.
2. Executive and organising ability.
3. Cultural and technical training.

V. GRAPH OF SUGGESTED METHOD OF ORGANISATION IN EACH COLLEGE.



4. Attractive personality and leadership.
5. Athletic and gymnastic ability.
6. A good physique and good health.
7. Business ability.

In the Y.M.C.A. School of Physical Education, Royapettah, Madras, we have trained a few, and are still training such highly-qualified men for physical education work in India, but we have still a very long way to go to bridge the gap between non-productive 'drill-master' methods and the productive ideal scheme of physical education.

We must have in the profession educated, technically-trained specialists, who shall be paid decent salaries and who shall be given equal status with other specialists on the staff.

VI. CREDIT OR POINT SCORING METHOD TO MAKE PHYSICAL EDUCATION COMPULSORY.

It is suggested that only those students who have participated in some form of physical activity a specified number of hours each month during the college year be permitted to sit for examinations, unless exempted by the Medical Examiner and Physical Director.

Each student should be supplied with a properly printed card each month, upon which he can record, or have recorded, and testified to by a second responsible party, the date and the kind of exercise in which he participated, with points according to hours of participation. This card must be turned in to the college clerk or Physical Director at the end of each month and a new card issued.

Credit shall be given for each hour of exercise taken, according to the physiological benefits of the exercise, a certain number of points to be credited per hour of exercise.

Such a method would make participation in physical activities compulsory, but students would be permitted to select, unless the medical and physical examinations indicated certain required remedial exercise.

PROPOSED CHART OF CREDIT MARKS.

Activity.	Period of Participation.	Points.
Hockey, Match or Practice ...	1 hr.	10
Football, Match or Practice ...	1 hr.	10
Cricket, Match ...	One innings	10
Cricket, Practice—Batting and Bowling ...	1 hr.	5
Tennis Singles, Match or Practice ...	1 hr.	10
Tennis Doubles, Match or Practice ...	1 hr.	5
Athletics, Running, Jumping, Vaulting, etc. ...	1 hr.	10
Gymnastics ...	1 hr.	5
Calisthenics ...	$\frac{1}{2}$ hr.	5
Physical Training Classes, consisting of Calisthenics and Games ...	1 hr.	10
Special Corrective Classes ...	1 hr.	10
U. T. C. Activities ...	Drill Period	10
Basketball, Match or Practice ...	$\frac{1}{2}$ hr.	10
Handball or Fives ...	1 hr.	10
Volleyball or Baseball ...	1 hr.	5
Badminton ...	2 hrs.	5
Boxing or Wrestling ...	1 hr.	10
Aquatics ...	1 hr.	10
Brisk Walking ...	2 hrs.	5

Health Instruction—must pass examination on fundamentals of Hygiene and Sanitation.

Physical Efficiency—must pass certain standards of Physical Ability.

On the basis of this chart, students might be required to obtain marks as follows:

	Points required per week.	Points required per month.	Points required per year.
First and Second Year Students ...	40	160	960
Third and Fourth Year Students ...	30	120	720
Special or Graduate Students ...	20	80	480

VII. CLASSIFICATION OF STUDENTS.

Class A.—The normally sound who are athletically able to play on college teams:

The physical and medical examination will discover some students who have no organic weakness and whose posture and physique are such that special class-work is not necessary.

Exercise and recreation are, however, necessary, and students passing as sound should be permitted to make their credits by practice and participation on the various college teams.

Class B.—The normally sound, but who are disinclined to, or not proficient enough to, play on college teams:

For this group intra-mural games and physical training classes must be conducted.

Class C.—The remedially unfit students:

Those with weak vital organs, spinal curvatures, mal-posture, flat feet, physically weak, obese, etc.

For this group special corrective and recreative activities must be conducted.

Class D.—The totally unfit:

There will be an exceedingly small group, and such should be exempted from all physical training upon the advice of the examining physician.

Such exemption, however, should only be allowed for organic weaknesses or such other physical disabilities as would cause physical exercise to be dangerous or detrimental to the health of the individual.

This group should not be exempted from the health instruction classes, and every possible effort should be made to improve their condition.

VIII. SPACE AND EQUIPMENT REQUIRED.

Space large enough for sports and all major games is desirable, but not absolutely necessary.

With careful planning and wise organisation and allotment of time, an area as small as 80 ft. x 40 ft. can be so utilised as to make it possible to conduct a very effective programme of physical education.

Those colleges are fortunate which have ample play-grounds and athletic fields, but lack of these is not a legitimate excuse for not introducing physical training.

Every college can find a small plot of ground, or a hall, or an improvised gymnasium.

Colleges which have space, large or small, should so lay out the ground as to get maximum use from minimum space.

Such games as basketball, volleyball, handball, playground baseball, etc., while they should not replace such excellent games as football, etc., can be played by large numbers on very small courts, and should be introduced into those colleges which do not have athletic fields.

Likewise, calisthenics and informal games can be conducted on very small plots.

The amount of equipment required is not great, and the cost is not prohibitive.

Personnel is far more important than equipment, but a small amount of gymnastic equipment is desirable, and a good supply of sports and games materials is essential.

Athletic fees collected from students ought to be almost sufficient to purchase all equipment required.

Whether or not a gymnasium is necessary will depend entirely upon the time-table

drawn up for formal physical training classes.

Even then, those college compounds which have shade trees will not find gymnasiums necessary.

IX. TIME-TABLE.

1. Activities for Class A students can be conducted after regular college hours, and on holidays.
2. Intra-mural activities for Class B can be conducted before college classes begin in the morning, and in the evening after college hours.
3. Physical training classes for Class B should be conducted during the regular college class hours.
4. Special corrective classes for Class C should be conducted during the regular college class hours.
5. Training class for leaders should be conducted in the morning before college classes begin.
6. Physical training classes for resident students could be conducted early in the morning.

7. Certain hours and certain days can be set aside for those who desire individual instruction in boxing, wrestling, gymnastics, sports, etc.

8. Health instruction classes to be conducted during regular class hours.

Note.—In all of the above a sufficient number of periods is to be conducted each week to make it possible for the students to make the required number of credits.

The exact details of such a time-table would have to be carefully worked out by the Physical Director and College Principal, and would vary in different colleges.

(a) It will no doubt be advisable to require all first and second-year students to attend a certain number of formal physical training periods each week in addition to being permitted a selection of activities.

(b) Third and fourth-year and special students may be permitted to make all their credits by participating in selected activities, unless in need of special prescribed activities.—*The Young Men of India*, August '27.

Will be ready shortly.

A COLLEGE ALGEBRA

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lastly Principal and Professor of Mathematics, Kumbakonam College

AND
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NEW SCHOOL-BOOKS IN MODERN LANGUAGES.

By Mr. L. V. RAMASWAMI AIYAR, M.A., B.L.,
Ernakulam College, Cochin State.

The two enterprising publishing firms, Messrs. D. C. Heath, and Messrs. George Harraps deserve the thanks of the educational world for the exceedingly serviceable books in modern languages which they have been publishing of late. One interesting feature of these publications is the novel but very noble aim underlying them all, that they should serve to popularise contemporary ideas and encourage the study of the modernmost aspects of continental life. A very laudable aim this. From the point of view of the practical man, who wants to acquaint himself with the life and conditions on the continent to-day, such books would be infinitely more useful than those which, either through their choice of themes or through their treatment, merely deal with past conditions. As Lord Morley puts it in his *Miscellanies*, "What we want for ordinary readers who have not much time, and whose faculties of attention are already largely exhausted by the more important industry of the day, is the type of book which brings literature more close to actual life than such a poet as Racine does."

This ideal is well kept in view in a book like *Le crime de Sylvestre Bonnard* (by Anatole France) edited by J. L. Bergerhoff and published by Messrs. Heath (price 3s.) Anatole France is one of the most famous of recent French authors and the present book is an abridged edition of his masterpiece. The edition under review contains a short introduction, suggestive notes, passages for re-translation taken from the textual material, and a vocabulary. The book is eminently fitted for the use of advanced students in French.

Another book which Messrs. Heath have brought out is a volume entitled *Un Verano en Espana* (*A Summer in Spain*) by Roger Burgh Weems (price 3s.) This is a Spanish reading-book

recording the impressions and experiences of a party of American students who toured through Spain under the guidance of the author. An effective study of a foreign language embraces within its scope a fairly accurate acquaintance with the customs, institutions and history of the people speaking the language. To the beginner in Spanish who desires to have such an acquaintance (though only second-hand which is next best to actual experience and study on the spot), there can be no more useful book than the one under review. It is not merely informative. The treatment, the choice of scenes and the picturesqueness of the descriptions, together with the clear illustration, render the book a joy in the hands of the student of Spanish. Some of the topics dealt with in the book are: the old-world charm of Spanish beauty-spots and monasteries, bull-fights, theatres, places of historical interest like the Alhambra and experiences like the one described on page 29 relating to the uncomfortable *butacas* of Spanish trains *que no viajero puede olvidar*. The reader's interest in topics like these in which the book abounds, never flags, and he also goes on gathering information about the ways and manners of the Spanish people with the minimum tedium possible.

Yet another modern French text which Messrs. Heath have published is a novel by Rene Bazin, by name *Les oberle* edited by I. H. B. Spiers (price 2s. 6d.) This is a story of Alsatian life of the end of the last century. The province of Alsace, a frontier province between France and Germany, has been for centuries a bone of contention between these two nations. After the war of 1871 when Germany conquered the province from France, the opinion amongst the natives of the province regarding the change in sovereignty was strangely divided. The contrast between the attitude of the *Revanche* patriots of the Gambetta-type and that of people who felt obliged to acquiesce in the new German supremacy, was remarkable

in the extreme. It is this contrast that is pictorially brought out in the book under review. Reading through the text, we are struck with the intensity of the *Revanche* idea which was so strong in the idealism of Alsatian youth and which probably helped the French greatly during the recent war. This feeling was incomprehensible to the German conqueror. *Tete de Français* says Farnow, representing the conqueror's standpoint, *Quel étrange caractère que celui de ce peuple, qui ne peut pas prendre son parti d'avoir etc. conquis, et qui se croit deshonoré quand les Allemands lui font une avance.*—A vocabulary at the end of the book renders immense help to the beginner.

Exercises in French Syntax (founded upon a *Grammar of Present-day French*) by J. E. Manson is a good laboratory note-book brought out by Messrs. Harraps for the use of classes which have to study the nuances of modern French

composition. Besides copious exercises on grammatical features, there are a number of English passages for re-translation, a speciality of which is that they are all taken from modern English authors.

Another book published by Messrs. Harraps is *A Book of Free Composition in French*, by H. J. B. Wanstall (price 2sh.)—The contents include stories in pictures, verse and prose passages for summarising, subjects for letter-writing, dialogues, outlines for expansion and subjects for general essays. A few typical instances of the last-mentioned group are: *Your Favourite Pastime, A Tiger Hunt, Your Future Career, An Aerial Journey, A visit to the Planet Mars, The Value of Modern Languages, The League of Nations, International Antipathies.*

A good composition-book which we can heartily recommend to Indian students of French.

COMMERCIAL ARITHMETIC

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SECONDARY AND COMMERCIAL SCHOOLS

Prepared in accordance with the S. S. L. C. Syllabus

By T. V. SUBRAMANIA AIYAR,

Commercial Instructor, Govt. Muhammadan College, Madras;

Author of

Commercial Correspondence, Book-keeping for Beginners, Graduated Exercises in Typewriting, etc.

CONTENTS.

CHAP. I. Some short cuts and artifices; II. Signs, tables and vocabulary; III. Averages and Percentages; IV. Insurance, Commission, Brokerage, Tradesmen's Discount, Rates and Taxes, Bankruptcy; V. Bills and Invoices; VI. Profit and Loss; VII. Alligation, VIII. Partnership; IX. Interest—Simple and Compound; X. Present Worth and Discount; XI. Equation of Payments; XII. Shares and Stocks; XIII. The Metric System; XIV. Foreign Moneys and Exchange; XV. Miscellaneous Examples; XVI. Madras S. S. L. C. Question Papers; APPENDIX—Answers.

OPINION.

Mercantile Miscellany, April 1926:—The enterprising firm of Messrs. Srinivasa Varadachari and Co., Mount Road, Madras, have sent us a copy of *Commercial Arithmetic* for S. S. L. C. students which they have published. The book is a very useful addition to the existing literature on the subject and bids fair to be regarded as a Standard Text-book on the subject on this side. Needless to add that the book being written with a commercial bias it should prove invaluable to all youths aspiring after commercial or business career. We congratulate the author, Mr. T. V. Subramania Iyer, and the Publishers, for the neatly got-up little volume before us.

D. Cr. 8vo. about 200 pp. Price Rs. 1-4-0.

SRI NIVASA VARADACHARI & CO., 4, MOUNT ROAD, MADRAS.

Reviews and Notices.

A PRIMER OF GEOMETRY, BY W. PARKINSON AND A. J. PRESSLAND—EDITION FOR INDIA—(OXFORD UNIVERSITY PRESS, 1924.) Pp. 272. Price: Rs. 1-12 as.

The authors of this work have dealt with the subject-matter of old Euclid in a fresh, lucid and attractive manner that must readily appeal to the beginners of Geometry. The proofs are presented in simple non-technical terms as far as possible, and in the sequence of theorems, they have followed closely the recommendations of the Committee appointed by the Incorporated Association of Assistant-masters in Secondary Schools in England. Figures are neat and elegantly lettered.

The book concludes with a Historical Sketch of Greek Geometry, which adds to its value and interest to students. Recent question papers set by the Oxford, Cambridge and Scottish School Certificate Examinations are also appended.

We have no hesitation in recommending the book as a text-book for the High School classes in India.

A PREPARATORY ARITHMETIC, BY CHARLES PENDLEBURY. (LONDON: G. BELL & SONS, 1924.) xiv + pp. 290 + xlviii. Price 3s.

This book gives a good introduction to and grounding in the elementary arithmetical processes and their applications to ordinary concrete problems. The later chapters deal with numerical geometry and the mensuration of simple geometrical solids. A brief attempt is also made towards the end of the book to explain simple business calculations. On the whole the treatment is as complete and comprehensive as it can be, and no diligent student who has worked through the book need entertain any of the fears and misgivings that usually go with the name 'Arithmetic.'

The book is strongly recommended for the Upper Middle School and the Junior High School classes in India.

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The Educational Review

We congratulate Mr. R. M. Statham on the excellent report he has produced on the expansion of elementary education in Madras. Without entering into great detail, we may say that on the whole we are in agreement with practically every suggestion made by him. It will be noticed from the figures given in the report that the Presidency of Madras is very much in advance of all the other presidencies in India in the matter of elementary education, judged by the percentage of the total population undergoing instruction in schools. The figures are as follow:—

Madras	... 5.50
Bombay	... 5.28
The Punjab	... 5.13
Bengal	... 4.75
Burma	... 4.20
Assam	... 3.60
Bihar & Orissa	... 3.18
Central Provinces...	2.72
United Provinces ...	2.62

The superiority holds good not merely with regard to the general percentage of children attending school but also with regard to the separate percentages for boys and girls.

There are, however, certain other features relating to elementary education in Madras which are not so encouraging. A very unsatisfactory feature is the presence of a large number of single-teacher schools which are extremely ineffective. It is obviously impossible

for a teacher to be in charge of as many as four classes, as is often the case in the Elementary Schools of the Presidency, and we are not surprised that Mr. Statham has strongly condemned the existence of institutions of this kind. It was only the other day that the Punjab abandoned practically all schools of this type and the sooner the Madras Presidency follows the example, the better for the progress of elementary education.

Among the recommendations made by Mr. Statham is the abolition of District Educational Councils which, according to him, have failed absolutely. We have no doubt that in expressing this opinion he is only echoing a conviction which has been gaining ground very widely among all sections of people in the Madras Presidency during the last few years. The following are the reasons assigned for the discontinuance of these Committees which have served no useful purpose in the expansion of elementary education:—

(1) they have not fulfilled all their duties satisfactorily;

(2) they form no logical part of a scheme for progressive local self-government;

(3) they cannot be expected to prepare schemes which they can neither finance nor control and;

(4) they do not exist elsewhere in India, in provinces which are faced with almost the identical problems of Madras.

In spite of the fact that more expenditure will be required, Mr. Statham has not hesitated to make new proposals for

the constitution of an additional inspecting agency, specially for the purpose of controlling elementary education. An officer at the head-quarters, three divisional inspectors engaged specially for the work and a better class of District Educational officers are among the proposals made by Mr. Statham, and we have a feeling, this amount of additional expenditure should not be grudged. As far as the management of elementary educational institutions are concerned, without wishing to interfere with the principle of local self-government, Mr. Statham only wishes to have a guarantee for expert educational advice being always available in the final settlement of matters. The following are his proposals regarding the agency for the control of elementary education:—

(1) A specially-constituted Committee of the District Board will be responsible for all elementary education within the District Board area.

(2) The payment of all grants-in-aid will be made by these committees.

(3) The recognition of all classes of elementary schools will be granted by the District Educational Officers and by the Inspectresses of Girls' Schools.

(4) The inspecting agency of the Educational Department must be so re-organized as to ensure (a) that the Education Department is in a position to undertake the initiation and supervision of definite programmes for expansion in every District; and (b) that the co-operation between the department and local bodies is real and effective.

(5) The appointment, transfer and pay of all teachers in elementary schools will be subject to the approval of the District Educational Officer.

We are afraid the section of Mr. Statham's report relating to the financial responsibility of his scheme of expansion and progress is about the weakest. It may, however, be argued in fairness to him that he cannot be expected to prepare a detailed scheme of financial commitments which will be possible only on a closer examination of the situation modified by local conditions and the capacity of local bodies to contribute to the work of expansion. Proposals of compulsion and a more liberal system of grants for aided schools than has been obtaining in the past are among other recommendations made by Mr. Statham. There is a section dealing with the education of girls in his report in which he pleads for separate attention to the subject in any system of educational control and expansion. Wherever the number of girls is sufficiently large, Mr. Statham would have separate schools for girls and would allow co-education only where other conditions are possible owing to his conviction that girls do not often get sufficient attention in schools meant for boys. The following is a summary of the recommendations made by Mr. Statham:—

(1) The abolition of the District Educational Councils.

(2) The institution of School Committees of District Boards and Municipalities

to control and finance all elementary education.

(3) The restoration of the power of granting recognition back to the Educational Department.

(4) The reorganisation of the inspecting agency so as to provide for an Inspector of Elementary Education and three Divisional Inspectors of Schools.

(5) The protection and development of the aided agencies.

(6) An increase in the rates of grants-in-aid.

(7) The gradual elimination of the single-teacher schools.

(8) The adoption in every district and municipality of definite programmes of consolidation and expansion limited to a set period of years.

(9) Consolidation before expansion and the introduction of compulsion.

(10) The taking of power by the Government to enforce the introduction of compulsion where necessary.

(11) The fixing of minimum pay for all teachers, trained and untrained.

(12) The ultimate staffing of all schools by trained teachers.

(13) The grading of local bodies according to their relative wealth and poverty for purposes of granting Government subsidies.

(14) The adoption of a policy which will recognise the financing of elementary education as the first charge on the provincial and local revenues.

(15) The insistence of a minimum percentage of expenditure by local bodies on elementary education.

(16) The treatment of girls' education generally as a separate problem, needing a special survey and investigation.

(17) The adaptation of the instruction given in rural schools to the life and needs of the rural community.

(18) The co-operation of all departments in rural community work.

We only hope the Government of Madras will not sleep over the report as has often been the case with regard to pious schemes for the expansion of elementary education, but take immediate and energetic action which may lead to important developments.

We offer our hearty congratulations to Prof. S. Radhakrishnan, George V Professor of Philosophy of the

University of Calcutta, on his unanimous election to the Presidentship of the Post-Graduate Council of Arts at the Calcutta University. Our gratification is not merely on the account that a scholar from Madras has been able during his short stay at the Calcutta University to command the overwhelming confidence of his colleagues, but also because of the fact that Prof. Radhakrishnan is the first educationist to be elected to that office in the annals of the Calcutta University. It had been taken for granted till now that only public men and men of affairs were competent to hold the office and that no educationist was competent to fill it with distinction. Sir Asutosh Mukher-

jee and Sir Nilratan Sircar were the first two occupants of the Presidentship and without any wish to question their valuable services to the University of Calcutta, we must rejoice that the University has done the right thing in electing an educationist to the office. Prof. Radhakrishnan signalized his election to the office by the expression of certain sentiments relating to University Education which seem to deserve wider notice. In thanking the members for the honour they had done him, he said that "learning and scholarship could not thrive if they did not have an atmosphere of freedom. They should therefore endeavour to resist every encroachment which was likely to cut into the integrity and independence of the post-graduate department. The autonomy of the department must be carefully preserved. It should be their objective to maintain in the department a high level of academic efficiency." If Prof. Radhakrishnan can do something during the period of his office to raise the standard of the degrees of the Post-Graduate Department, he will have done lasting service to the University of Calcutta. We convey to him our cordial good wishes for his success in the new office to which he has been called.

It was an excellent idea on the part of the University of Mysore to confer the Honorary Degree of D. Sc. on His Excellency Lord Irwin in the course of his recent visit to the University. Lord Irwin's strong interest

in education and agriculture qualifies him particularly for such an honour. In accepting the distinction, Lord Irwin took occasion to speak on the right ideals of University Education. In these days of the rapid multiplication of Universities and the great danger of the lowering of standards in the mere pursuit of the production of a larger number of graduates, Lord Irwin's caution would seem to deserve special attention. Lord Irwin said that education in a University ought to mean that students have learnt "to think things for themselves, test them in the great laboratory of truth and allot to each its proper place in their scheme of life." The graduates of a University should be able to show in their culture and their character the twin-stamp of all that is best in the University training and that they are now going out into the world determined to extend the frontiers of their knowledge and to repay the debt they owe to their University by using to the best advantage the lessons it has taught them. So long as such a high ideal is kept undimmed before them, Universities cannot end in failure.

We have referred from time to time to the need for reform in the direction of ensuring better security in service for teachers in our Secondary Schools. It was only the other day that we drew attention to the new set of rules framed by the University of Calcutta towards that purpose. The rules have since been sanctioned by the Syndicate.

Security of Service.

and schools have been informed that they cannot hope for affiliation to the University unless they conform to the conditions laid down with regard to their proper management. A very pleasing instance of the determination on the part of the Calcutta University to see that justice is done to the teachers of Secondary Schools within their jurisdiction has occurred recently and deserves to be brought to the notice of the teaching profession in the whole country. The Manager of the Athenæum Institution—a High School affiliated to the Calcutta University—dismissed the Headmaster, Babu Jogesh Chandra Chakravarty, B.A., B.T., without adequate reason. This high-handed act was followed by the dismissal of as many as eight other teachers of the same institution. The Syndicate of the Calcutta University, having gone into the matter, has demanded the re-instatement of the Headmaster and the teachers whose services have been wrongly dispensed with by the management on pain of disaffiliating the institution. We hope the University will stick to this resolution and teach a much-needed lesson for the managements of schools always fond of over-riding the rights and privileges of helpless school-masters in their services. It is obviously the duty of any University which has schools affiliated to it, to safeguard the interests of their staff, without which efficient conditions of educational progress are undoubtedly impossible.

Among the numerous difficulties connected with the introduction of the vernaculars as media of instruction even in Secondary Schools is the possible deterioration of standards of English teaching. This problem has been confronting the authorities of the Calcutta University in view of the very extensive introduction of Bengali as the medium of instruction in High Schools. Realising the serious consequences, the University in co-operation with the Department of Education has framed a new scheme for the special training of English teachers by means of short courses in Training Colleges and other means. It is being laid down that no teacher will be considered to be qualified for teaching English in Secondary Schools unless he possesses the special certificate for the purpose, except in cases where he has already been a teacher of English for ten years and is considered qualified on that special ground. While appreciating the feeling on the part of some of the teachers of Secondary Schools that difficulties are placed in the path of their advancement by insisting on such new conditions, we must express our sympathy with the desire of the University authorities in Calcutta to ensure a certain minimum standard of efficiency in the matter of English teaching. There is sure to be an educational and cultural set-back in our educational system if the introduction of the vernaculars as the media of instruction is not accompanied by adequate safeguards for the maintenance

of a minimum standard of efficiency in English. We hope that better counsels will prevail and the teachers of the province will reconcile themselves to the new scheme with such modifications as may be considered necessary in the interests of justice.

In view of the keen differences of opinion prevailing in various parts of the country with regard to the creation of separate Boards apart from the Universities for the control of Intermediate Education, it may be worth while knowing something of the experiences of provinces which have made an attempt in the direction. The working of the Intermediate Education Scheme in the United Provinces has been causing keen dissatisfaction. It ran to such a pitch that the Government had to appoint a Committee to consider the improvement of Intermediate Education in the United Provinces, though the limitation was prescribed that it should be within the present High School and Intermediate Education Act. The report has just been issued and it contains a number of valuable sugges-

tions for improving the equipment, *personnel* and other details connected with the organisation of Intermediate Education in the Provinces. Curiously enough, a similar enquiry has taken place under Government auspices in the province of Dacca where a Committee has just submitted its report on the question. It is depressing to hear that in the opinion of the Committee, the Intermediate Board "has accomplished little and it could not have accomplished much." We are told that the Board has made neither High Schools nor Intermediate Colleges; that under its auspices the standard of examinations held has been lowered instead of being raised and that it is the deliberate opinion of the Committee that to prolong the existence of the Board in its present condition would be futile. In view of the fact that the establishment of an Intermediate Board is being contemplated for Bengal, to take over charge of Intermediate Education from the Calcutta University, it would be interesting to know what action is going to be taken on this report and the experience should be valuable for other provinces contemplating similar schemes.

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WITH A FOREWORD FROM

The Hon'ble Sir A. P. PATRO, Kt.,

Minister of Education, Madras.

BY

K. R. R. SASTRY, M.A., L.T.,

Fellow of the Royal Economic Society (London); sometime Deputy Inspector of Schools, Dharmapuri and Pattukkottai Districts; author of "South Indian Gids."

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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, she 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.

XXXIII—2

The Madras Christian College Magazine, January 1926.

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 playground 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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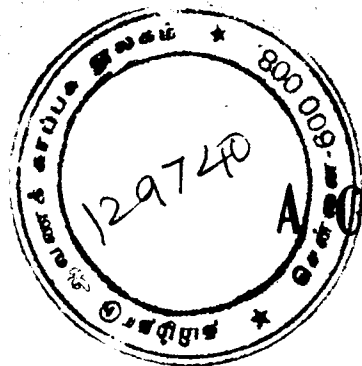
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