

Elementary Education for Indian Boys

*Being an examination of the aims and scope of our Rural
and Vernacular Educational Policies*

BY

Dr.V. Varahanarasimham, M.A., Ph.D.

Collegiate Teachers' Certificate-holder

*An Inspecting Officer of Elementary Schools under the
Madras Government*

*Fellow of the Royal Economic Society (London)
and Member of the Royal Asiatic Society (Ceylon)*

WITH A FOREWORD BY

B. Venkatapati Raz, M.L.A.

High Court Vakil, Vizagapatam.

"The subject of Education is one which is always living on the
innovator and the theorist. Everyone as he grows up becomes
aware of time lost and effort misapplied in his own case. It is not
unnatural to desire to save our children from a like waste of power."

Mark Pattison.

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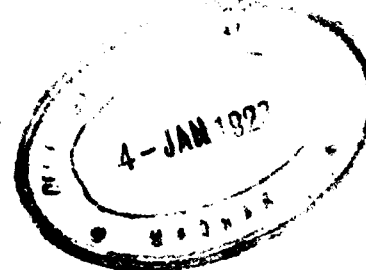
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To

The Hon'ble Mr. B. N. SARMA,

Member of Council for Revenue and Agriculture, India.

This Tractate

is humbly dedicated as a token of deep respect in appreciation of his very invaluable services for the national uplift by the maintenance throughout, of a bold and progressive attitude in all public matters,

BY

The Author.

IV

V

"Our centre of culture should not only be the centre of the intellectual life of India, but the centre of her economic life also. It must cultivate land, breed cattle to feed itself and its students; it must produce all necessaries, devising the best means and using the best materials, calling science to its aid. Its very existence should depend upon the success of its industrial ventures carried out on the co-operative principle which will unite the teachers and students in a living and active bond of necessity. This will give us also a practical industrial training, whose motive force is not the greed of profit.

Their (*village*) housing accommodation, sanitation, the improvement of their moral and intellectual life—these should form the object of the social side of its activity."

TAGORE—*The Centre of Indian Culture.*

"The thing that India needs most to-day is mass education; not the kind that would take the farmer off his field and the artisan away from his trade, but integral education, a simultaneous culture of the head, heart and hand. The Indian agriculturist has to be taught the use of modern farm machinery; initiated into the use of manures that will recoup his worn-out soil; taught that it is criminal for him to marry his children under a certain age; instructed in thrift; encouraged to study his peculiar position and show how to improve it; coaxed to care less about the influence of the moon and stars on his crops and to depend more upon intensive farming. The Indian craftsman requires to be told that he should expect to be crushed down if he persists in adhering to his cumbersome methods of doing his work; he has to be instructed in the employment of modern ways and machinery and persuaded to use these in preference to the crude implements and habits he has inherited from his forefathers. The monied class, in their turn have to be impressed with the desirability of employing their capital as a good husbandman ought to use his seed supply, *etc.* for reproductive work; they have to be influenced so they will give up burying their treasure in the ground or investing in Government promissory notes and the like; or locking it up in gold and silver tinsel for their women-folk, as they

do at present; and they must gradually be prevailed upon to invest their money in business conducted on a co-operative basis as joint stock corporations; India stands in urgent need of agricultural, polytechnic and commercial education, given broadcast to the swarming millions of the land."

NIHAL SINGH—*Urge Divine.*

"The Primary School system is and always has been largely out of touch with some of the economic needs of the community which it ought to serve. The cultivator has not yet learned to value education as an equipment for his life; he often fears, not without reason, that his children may be tempted away from the land by a system of training which has no bearing upon the work of the fields."

DR. SADLER—in *The Official Summary of the Calcutta University Commission Report.*

"Education should fill the needs, the requirements of the time and the country. In Indian villages,—such as they are, attempts should be made to open up schools, at least, for elementary vocational education. Right now is the time to provide for the training of mechanics, farmers and skilled workers, if India as a nation is to go up and not sink down. The boys of to-day will be the citizens of New India. Why not train them to be workers and producers? Too often the students of the Indian schools imagine that education has no other ulterior end than to make them live by their wits on easy streets. Surely there is something radically wrong with the schools which makes such a distorted conception of education possible. The remedy should be sought by giving instruction in vocational training, by teaching occupations which ensure self-support. *Education should be cultural as well as serviceable.*"

SUDHINDRA BOSE, PH.D.—*Fifteen Years in America.*

"Such (primary) education as is provided is of an unpractical character. The cultivator and the craftsman view it with disfavour as tending to estrange their boys from their surroundings and to make them dissatisfied with their hereditary calling without necessarily fitting them for anything better."

SIR M. VENKESWARAIYA'S—*Reconstructing India.*

FOREWORD

IT is an honour to a layman to add a preface to the splendid work of an educationist who offers constructive reform of education. I agree generally with the views expressed by this educational reformer. The present system needs a profound and thorough change to suit the needs of the country and the times. As the author dealt with the subject thoroughly, it is a supererogation to discuss it in detail. The crux of the whole matter is that the Government should be convinced of the inutility of the present system. Owing to the scrappiness of thought in educational matters the authorities are working at cross-purposes. The teachers should be better trained for efficient teaching. The curriculum should be so arranged as to be attractive and utilitarian. Monotony of study can be avoided by basing teaching on the realities of life to stimulate interest in the student. Even mathematics, history and geography may be made attractive by their closer application to the practical and living interest of the world's realities. Learned professors often teach subjects ununderstandable by pupils instead of adjusting their teaching to the capacity and calibre of youthful minds. Red tape should be avoided in the classroom by sticking to definite rules whether suited to the locality or no, as though they were as unchangeable as the laws of the Medes and Persians. Teachers might teach less and students learn more by creating such environment that students would be able to teach themselves by methods that develop in them initiative and spontaneity. In the wide range of subjects to be taught, correlation is essential. The artistic faculty should be developed

instead of being discouraged. The present criterion of progress of attaching too much value to the examination results is the bane of the present system. The utilitarian aspect of education is not at all opposed to the ideal, if the ideal aimed at is social usefulness instead of individual success. As Mr. Richmond pointed out, civic study is the association of learners' intellectual interests with a working philosophy of life. Fichte is perfectly right when he declared, that 'nothing but education can rescue us from all the miseries that overwhelm us.' The aim of education should be to raise pupils to the full height of their manhood which they are capable of, by making them self-reliant, and well informed public spirited gentlemen of upright character and unsullied morals. In fine, what we want is education, more education and still more education wide spread everywhere. The author is congratulated on his first attempt.

9th June, 1920.

B. VENKATAPATI RAZ.

I BELIEVE with Dr. Tagore that if there should be any real reform, it should proceed from within and right from the bottom. For an agricultural country like India, to be progressive it is essential that the people of the villages should beyond anything else be made well informed in order that they may lead happy and contented lives. Sir H. Butler once said that "Primary Education can fit the masses in this country to cope on equal terms with the forces, the strong and pressing forces of material progress. *It can create a greater adaptability to agricultural and industrial advancement.* It can enlarge the mind and brighten the out-look of the people and foster progressive desire which is the root of the economic growth of a community." That this object has yet remained unrealised is confessed in the Government of India's Despatch on the Reforms :—

"So far as Primary Education is concerned, the chief defects are well known. It is very limited in quantity; there is great wastage by the way. Teachers are ill paid, poor in quality and commanding little respect; the inspection is insufficient and indifferent; as a result the course takes too long and yields but small results and very little of the knowledge attained, remains in after life. The conservatism of the lower classes and the defects of the system have in fact reacted on each other. The people need to be awakened to the value of education as making lads better farmers instead of merely spoiling them for a rural life and the system needs to be improved by more schools, better trained teachers, better courses, and better inspection, all of which means not merely money but a wise outlay of it."

To achieve it, a rational system of elementary education is very desirable and some of these principles have been set forth here. This monograph has now been prepared as an appeal not only to the body of educational and agricultural experts to revise the existing scheme with a view to bring it more in touch with the actual

needs of those industrial classes for whose children it is intended but also to—

(1) The Ministers under the New Reform Scheme, who have to consider as the Publicity Leaflet No. 67 of 1920 says, among other matters "Whether it is possible to set up new schools, whether all parents should be compelled to send their children to schools and what should be taught in the schools." It is likely that in their zeal to extend education to all, they may waste huge sums on increasing the number of the present kind of schools instead of concentrating on a few self-supporting Farm Schools in every Taluk and Trade Schools in urban areas—an Indian Hampton similar to the Tuskegee Institute undertaken by Booker T. Washington of the United States of America accompanied invariably by model factories, literary and cultural instruction being imparted only under these conditions and under no other, as it is apt to be forgotten for want of use when pupils ultimately return to their farms: and

(2) The Members of Legislative bodies who base their Bills for Compulsory Elementary Education mainly on Vernacular and English literacy and the Three R's. It has to be remembered that as Mr. Ramsay Macdonald says: Literary tradition was originally designed to supply "native clerks and subordinate officers" which has now, as we see only resulted in great discontent owing to the excess of supply over demand in this direction. As Mr. C. R. Reddy aptly puts it "It is the biggest fallacy that has vitiated and circumscribed educational activities in India. On the contrary, I think that our people are quicker at learning through the ear than the eye." As Bernard Shaw pointed out: "The mere transformation of institutions as from *general illiteracy* to general literacy are all but changes from Tweedledum to Tweedledee—a

mere change of name which is very little." In this connection it is worth while considering what Dr. A. Coomaraswamy says:—"I do not understand the position of those who think that it is more important that every one should learn to read or write than that the work of master minds should sway the hearts of men. I do not think that Universal Board School Education in India and Ceylon will do for the illiterate peasants what the works of Valmiki and Tulsidas, Kambam and Manikka Vacigar have already indirectly done for them throughout that great continent. The education of the Indian peasant and the Indian woman is already admirable. It is indeed a limited education but very few of us are, or are likely for a long time, to be qualified to improve it. It is idle to think that the Three R's in themselves will restore to modern life that reverence for learning and sensitiveness to beauty which it has lost."

Owing to the fact of myself being an officer who has to come in daily contact with the type of schools in question, I may be excused for offering my views and suggestions for a constructive programme which though not original in themselves are fully substantiated by the opinions of those who have spent some thought over the matter. There is no wisdom at all in *compelling* pupils to attend schools as they are at present constituted, which are a wasteful source of enormous public expenditure, but, this objection does not however stand if the farmers' sons are given for the present compulsory primary education if it is to end with the Vernacular Agricultural Schools, (of the type proposed for Taliparamba and Anakapalle) which have to be established at the centre of every four or five villages,* instead of the Central Agricultural Research

* See Appendix Part III.

Institutes monopolising all the attention in the matter of Agricultural Education.

Lord Rosebury in 1912, with reference to the students who were being turned out, hesitatingly said :—

“There are circumstances connected with our population which do make one feel at times that those Education Acts of Mr. Foster and Lord Young have not gathered up the population, have not raised them in the way which we were once led to expect..... Education is undoubtedly higher in all the standards and all the subjects, all that makes for ‘grants’—but I sometimes wonder in myself whether we are turning out better men morally, better men physically, *men of more capacity for the work which the world sets before them*. If that be so, if there be any doubt permissible on that point *we must admit that the great Act of Lord Young has not been so great a success as we anticipated.*”

Sir John Gorst also said in November 1911: “We are spending millions.....on what is called education. The majority of those who care for the welfare of the people and are experts in education are of opinion that the greater part of this money is, under the present system, wasted and might as well, so far as education is concerned, be thrown into the sea.” Mr. Holmes the Chief Inspector of Elementary Schools and the author of *The Tragedy of Education*, goes much further. He says “The education given in thousands of our Elementary Schools is then in the highest degree anti-educational. To say that elementary education as it is given in such a school tends to arrest growth is to under-estimate its capacity for mischief.....The result is that the various faculties which education is supposed to train, become irretrievably starved and stunted.” The Poor Law Commissioners were of the same view when they say “Our expensive elementary education system (costing £20,000,000 annually) is having no effect on poverty, it is not developing self-reliance or forethought in the characters of the children,

and is in fact persuading them to be clerks rather than artisans.” The verdict of the countryside is to the same effect. In a book on *Rural Problems* by Mr. H. Harber, Mr. Charles Bathurst, M.P., Secretary of the Central Land Association is reported to have said in 1912, before a conference, that in many parts of the country no man under fifty was to be found who had any real skill in laying a hedge, thatching a rick, using a scythe, shearing a sheep, or milking a cow, and pointed out how estate-carpenters and workmen were increasingly difficult to obtain though high wages were offered. Mr. Harber goes on to say in his book: “Not only is this undoubtedly so, but any countryman who complains of it, whether he be the squire of the village or the sixteen shilling labourer, ascribes it directly to the existence of the village school. Too much education has resulted in complete incapacity for the everyday work of the country. It is a striking comment on our rural schools.”

If, however, the sons of working men are given something more than instruction in the traditional Three R's in order that they might in these days of efficiency and competition get some training in those very subjects which bear on their life's work, there should invariably be compulsion but there would scarcely be any need for it when education is made so useful.

Mr. Nesfield (then Inspector of Schools, Oudh) says that he was once present at a “large gathering of pupils from Primary Schools. The Deputy Commissioner asked them why they came to school at all. Fifty voices answered at once *to get employment*. He then asked, what employment? and the answer immediately was *Government*. The desire to obtain employment, and thus escape from the paternal plough or workshop, is almost universal among our vernacular students.”

Education thus, is being pursued merely with a view to effect a change in social status and not at all to be better informed, for increasing the efficiency of their

business. Such want of honesty in the intention to receive education, is very harmful to a country like this, which has already solved through the system of caste, the question of the organisation of society. I do not thereby, certainly have any such absurd idea that it is a law of man's nature that he shall follow without regard to his personal bent and capacities, the profession of his parents or his immediate or distant ancestors, the son of a milkman be a milkman, the son of a doctor a doctor, the descendants of shoemakers remain shoemakers to the end of measurable time; but as family stocks possess congenital and natural aptitudes in particular directions which have been developed by the operation of natural and social selection acting under favourable conditions, it must be remembered that the uniformity of results aimed at in the present system is merely outward and that all growth is a growth from within outwards and that all evolution is only a manifestation of preceeding involution.

Besides the establishment of Farm and Trade Schools and Factories, and making only such education compulsory, a few of the other principal reforms advocated here are:—

(1) The teachers are to be recruited more from the cultivating and farming classes than from the literary. They and the Inspecting Officers are to be thoroughly trained in Handicraft and Methods of Nature Study, Practical Gardening and Field work and Rural Science teaching, which should have as their object the fostering in pupils, *habits* of observation, experiment and judgment and enabling them to discover scientific explanations for agricultural processes. Every school should have as essential requisites of any vocational curriculum, instruction in Elementary Carpentry and Drawing, Smithy and Elementary Engineering (*viz.* fitting, turning and

moulding as is taught in Agricultural or Industrial Middle Schools) Commerce (as required by the Scheme of Studies for Elementary Schools) and Industrial Economics. As in the Dutch Schools, the aims of the two types of schools, Secondary and Rural are to be kept quite distinct. Higher Elementary Vernacular Agricultural Schools are to be started at the centre of every five villages which form a union.

(2) Extension Lectures to the teachers by the officers of the Agricultural, Veterinary, Medical and Sanitary departments.

(3) Closer co-operation between the Agricultural, Industrial, Co-operative and Educational departments, agricultural instruction on the lines adopted in agricultural schools being made compulsory in the Higher Elementary Schools.

(4) The organization of Rural settlements for Adult Education.

(5) The raising of the status and pay of the education members just to that extent as to enable them to live honourable lives: "They have to be paid not highly but adequately."

It is hoped that though the kind of education recommended in these pages seems more utilitarian than literary, the tone would generally be rendered healthy by fostering through cultural instruction, in the pupils, a spirit of co-operation in order to avoid the evils of competition prevalent in western industrialism and leading on to incessant warfare.

Instead of drifting into over-crowded cities, the rural children should be encouraged to stay on their farms and prepare themselves for the practical duties of the man on the land. If the object of Rural Education is merely to enable the boys to learn to read and write letters and

telegrams while the children of means of secondary schools use it for earning a livelihood, it is just reversing the proper position.

The substance of this work formed the subject of a paper read by me at a session of the local Teachers' Association, P. C. Venkatapathi Razu Garu, B.A., President, Taluk Board, Vizagapatam presiding on the occasion, when it was urged that I should bring out a book like the present one, suited to the altered Educational needs of the day. I have to thank B. Venkatapathi Raz Garu, M.L.A., who, during his term in the Legislative Council, strove not a little to improve the existing conditions of Primary Education in the country, for the readiness with which he has complied with my request that he might write the Foreword for the book, B. Sriramamurty Pantulu Garu, B.A., Deputy Collector (*now* Dewan to H.H. the Rani Sahiba of Wadhwan, Vizagapatam) for often inviting me for a mutual exchange of thoughts on the subject, on which, with his rare statesmanlike insight, he has already formed definite views, and the Manager, Methodist Publishing House for seeing that the publication leaves nothing to be desired as regards printing and get up, in spite of frequent modifications in the body of the text. Specially, I must express my indebtedness to A. Lakshmanaswamy Naidu Garu, the enlightened and enterprising Educational Publisher of the Saraswathi Telugu Readers, Rajahmundry, for the keen and genuine interest he has evinced throughout the course of the publication. But for his encouragement, I need hardly add, the book would not probably have seen the light of day in its present form.

V. VARAHANARASIMHAM.

Government Training School,
Vizagapatam.

Elementary Education

FOR INDIAN BOYS

1. Object of the paper—An Examination of the Present System :—

The Primary Education Act has after all come within the range of practical politics and people would naturally be interested to know how far the present system meets the required needs, if not what shape the schools of the future are going to assume and how the democratisation of knowledge, aimed at by the establishment of these schools would work eventually for national happiness. It is the object of this paper to indicate the principles which, *without considerable alteration in the existing State regulations*, bring about more satisfactorily the closer approximation of the school curriculum to rural needs.

2. The Present Condition :—

The success of Elementary Education mostly depends on our clear comprehension of the underlying idea of the present scheme. The latest ruling of the Local Government, in the system of Grant-in-Aid for Elementary Schools may appropriately minimise to a great extent the tendency to sow learning broadcast through the agency of a large number of inefficient schools. Besides, the Director of Public Instruction, Madras has also been pleased to issue recently a circular exhorting all educational officers to keep themselves abreast with the latest

developments in educational reform and encourage experiments in schools so as to afford greater flexibility to the scheme for adapting it to various conditions. He evinces particular interest in the improvement of the quality of the lowest classes.

Here is the graphic description by Mr. Michael West, I.E.S., Bengal, (in his EDUCATION SELECTIVE, SPECIFIC AND COMPENSATORY) of a typical Elementary School under his jurisdiction:—

"A Pundit not very young, never very energetic, filled full of malaria, ill-fed on a bulky nitrogenous diet and a victim of chronic dyspepsia is working in an out-of-the-way village, where the Sub-Inspector turns up once or twice a year. The climate is damp, hot, oppressive. The school-house is ill-ventilated, and its atmosphere more lethargic even than of the steamy rice fields which surround it. There are five separate sections to teach, all consisting of children, as dull and sleepy-eyed as the teacher himself.

The writer has taught in a Primary School himself for a short period. The heat, the stuffy atmosphere, the unpunctuality, the hopelessness of class-teaching where boys join the school at all times of the year and all times of the day; all these are things which the European visitor or Inspecting Officer does not realise. The lack of any social organization in the school makes the work doubly uninteresting. The boys' parents are a marvel and a mystery. They come and call the boys out of school to do menial tasks at home. Perhaps they return later—perhaps not. One parent had fixed great iron-fetters on his son's legs for some fault. He clanked into school. One boy came dressed every day in shabby velvet and sat picking the tops off sores. He never learnt anything else.

The teacher's pay is at a fixed rate. It is calculated according to the quality of the house, by the furniture, the roll number of the school, the average attendance (the attendance is merely a matter of pencil marks, it is not possible to check it), on the qualifications of the teacher, and last, one-fifth of the total, the quality of the work. The quality of the work is tested by a weary Sub-Inspector, who has trudged some four or five miles through the heat. He hears a boy read and another class meanwhile does a sum which he has written

on a slate or a much pitted black-board. The boys stumble occasionally in the reading. The sum is done wrong by the head boy of the class, all the rest copy him and so they are all wrong. The Sub-Inspector writes "Reading fair; Arithmetic bad."

He has no standard test to compare school with school. His test is perfunctory. He would never dare to reduce the grant of the school on such an examination. He writes his note:—

"To-day I visited Kothaona Lower Primary School. There is one teacher named Kehu Na, qualification Middle Vernacular plucked. There are thirty children on the roll:—

Standard.	No. on the roll.	No. present.	Rate of fees.
IV ...	1	1	0 4 0
III ...	3	2	0 3 0
II ...	2	1	0 3 0
Infant (2nd year)	6	4	0 2 0
„ (1st year)	18	12	0 2 0

Total ... 30 Total ... 20

Income.		Rs.	Expenditure.		Rs.
Fees ...	...	6	Teacher ...	...	7
Dt. Bd. Grant ...	...	2	Contingencies, 0 12 0)	...	1
			Garden 0 4 0)		
Total ...		8	Total ...		8

The School-building is of thatch. It is in bad repair. The furniture is defective. There is no map of the Province. Wall-charts of animals are also required."

Then he goes away, perhaps after dining with the Pundit or the nominal Secretary of the school or the Headman of the village, whose only educational function is this biennial dinner.

Look back through the pages of the thumbbed and tattered Inspection Book. For years back the same note has been written. Every year—"Reading moderate; Arithmetic bad." Every year the same statement of the same income and expenditure, both of which are purely fictitious, as fictitious as the fee-rate and as fictitious as that apportioning item four annas for a garden, of which no vestige is seen. Unless a healthy crop of jute, which obstructs the windows of the school house, and will in time bring in to the Pundit a sum much greater than the four annas wherewith he is supposed to educate his

charges in the principles of agriculture. The Sub-Inspector knows it is fictitious.

The boys pay fees when they can, and as much as they can, quite irrespective of the fee rate, or the class in which they are reading. There is no fixed rate; they too pay what they can and what the Pundit will be satisfied with (Jack fruits, brinjals and bananas, etc.) If he is not satisfied he will 'take it out' of the boy.

'House bamboo thatch' is also a yearly entry. It makes no difference to anybody. If the house is the Pundit's own he will patch it and patch it till it can be patched no more or till a hurricane blows it down or an enemy sets it on fire. When that happens it is the end of the school. There will be an interregnum and some one will start another school or the Pundit may rebuild the old one. Such things are not done until necessity compels.

As to furniture, the District Board is the only being who provides furniture. Sometimes a bench, and sometimes a clock arrives, sometimes a curious picture of an elephant or a rhinoceros or a cow quite unlike any cow that was ever seen in India, a thing of vast size and no hump. For all this the Pundit is grateful. But he would never think of providing such luxuries on his own account; and as for the cow and the rhinoceros, he does not understand the precise use of them. He hangs them up because it pleases the Sub-Inspector. The Sub-Inspector's remarks about furniture are no concern of the Pundit. If furniture is "defective" it is the fault of the District Board, and why his grant should be assessed according to the District Board's generosity in the matter of furniture, he has never troubled to inquire. In fact, the only function served by the Sub-Inspector's visit is that he assures himself of the actual existence of the school.

There are cases known of a grant being reduced for inefficiency but it is nearly always "inefficiency" of attendance, not of knowledge. There was never a case known of a grant being increased for the efficiency of the teaching of a small number of boys.* The Pundit's advantage is to have as large a number of boys as possible inscribed.

* The novel but unaffiliated Bolepur School alone of Tagore has classes of seven boys each. While in most schools, the boys are gathered together for the livelihood of the teachers, here the teacher feels that his special calling is the guardianship of the mind of the eternal child. Hence there is proportionately a greater need of teachers for giving individual attention.

on the roll but attending irregularly, a much larger number than his shed can accommodate and five or six times more than he can possibly teach."

3. Humanistic outlook and religious spirit—The primary requisite in any system of education :—

Grundtvig, the educational philosopher and the father of the Danish Folk (Agricultural) School believed that personality which is the principal aim of education is not developed best by the appeal to bring pupils to study based on the value of technical instruction or individual gain in money-making or success in a career—considerations which however are not negligible—but primarily through spirituality. Now, Western nations have developed a system of education fitted to their industrial growth based on principles of competition, but as the war has shown, though practical, it lacks on the spiritual side. But, we know, that India has a wealth of spiritual tradition though, now, only productive of laziness and selfishness through its spring-webs of fancy. She must therefore build up her system of education in such a manner that the coming scientific and industrial era, to be based on co-operation, may not be disastrous to her (as it has been to Europe) by the destruction of the religious spirit. No system of education, however utilitarian it may be is satisfactory unless it inspires its recipients with liberal virtues like veracity, integrity and selflessness. Though apparently there is no specific provision for religious instruction in the Scheme of Studies for Elementary Schools, there is yet ample scope for rich moral education indirectly through agencies like poetry which, besides the example of the teacher and his ideals, if properly taught, directly appeal to the very springs of life.

Under the influence of these new humanistic ideas, no subject in the kindergarten scheme has undergone such modification in the methods of teaching as Nature Study. The old type of the museum collector indulged in killing specimens in various ways, though the victims themselves took a different view of the matter, from that of the morbid and crazy experimenter whose lust differs in no way from any other form of lust. You are now required to treat birds with every kindness, place perches for them to sit upon, encourage them to come to you. Is it not hideous to think of opening out (though under anaesthesia) of the whole internal cavity of an animal's body, the probing of tubes down veins and arteries, the dissecting of important nerves even of the spinal cord itself and the stimulating of the cut ends with electricity!

A modern kindergartener says "whenever the question of observing nature specimens arises, the kindergartener must remember that in the kindergarten the child must become acquainted with nature's best, not with deformities. The kindergarten thus can never become a place for keeping of captive creatures, frequently with maudlin sentiment called pet animals. A caged bird, a rabbit in a hutch, a pet monkey are all odious and ugly and pitiful. Further all specimens must be handled carefully and lovingly. It is no uncommon thing to see a teacher as well as his pupils seizing the most delicate blossoms with the same rough vigour one might use to hold a wild animal; nor is it less common to see living animals pinned out in the most barbarous fashion and mutilated without a moment's consideration of the pain endured by them. It seldom occurs to a pupil that a spider with its legs pulled out suffers atrocious torment; that a lizard with a string tied tightly round its neck or a living

butterfly or a beetle with a pin through its body, or a wounded bird with a string round its leg, or a frog with pins through its four feet is a display of horrible cruelty. Teachers must therefore be very careful to handle all specimens delicately and to insist that pupils do the same. Nature study must be joined with imagination and a spirit of reverence." "In the kindergarten the more prominent aims are aesthetic and religious."

4. Preparation for active and higher education of life; people's want of co-operation with the State:—

If this be the fundamental aim of education, what is the particular end which the Scheme of Elementary Education has been designed to meet. Its enunciation by Dr. Bourne that "schools should give the boys *that* training that their parents, circumstances and their own circumstances call for" supplemented by the requirement in the Grant-in-Aid Code for the enhancement of the grant, "that it should generally fit them for their position in life" definitely indicates that it was intended to be more in touch with the actual needs and surroundings of the rural pupils; but it would be idle for any body to imagine even for a moment that the schools mainly intended for the children of the rustic agricultural and labouring classes, should wholly turn out to be agricultural, industrial or technical schools before the pupils are taken through the requisite preparatory course of instruction. It has been recognised in the scheme of education of all advanced countries, how the period of student-life should be distributed. From the fourth year onwards for about 2 years, the child is trained in good habits and manners, and from the middle of the

fifth (even the latest Montessori view corresponds exactly with our indigenous convention in the matter) or commencement of the sixth, for 5 years, he is given Lower and Upper Primary Education mostly concerned with the training of the senses, psychological results at this stage being measured by experimental tests like those of Simon and Binet.* From the eleventh year begins the Lower Secondary course continuing for 4 years when general education blended with such instruction in occupational subjects (slojd) essential in a perfect scheme, terminates; at this stage rudimentary specialisation with reference to the individual vocational aptitudes commences, covering over a period of another 4 years when the student matriculates, and prepares himself for degree courses where he can shortly graduate--Pass or with Honours and if he wants he may for a little time more, prosecute his course in his subject of research for a Master's or Doctor's Degree. Though our educational systems also are no exception to the general rule, the objects aimed at cannot be achieved by the mere enactment, however effective it might be, of the Government, unless the people also willingly co-operate with them to make the carefully formed schemes a success. For instance, in the courses for Elementary Training Schools, ample provision has been made by means of criticism and model lessons, experimental section, unallotted periods (generally idled away in superfluous literary and artistic work calculated

* Works on Experimental Psychology prepared with special reference to Vocational Education like *Employment Psychology*, by H. C. Link; *Present day applications of Psychology with special reference to Industry, Education and Nervous Breakdown*, by C. S. Myers; *Psychology and Industrial Efficiency*, by H. Munsterberg, may be consulted.

in no way to develop among rural teachers either correct articulation or elegant language) to give the students as practically as possible training in the teaching of various subjects illustrative of rational methods, but actually the elementary schoolmaster is taught even in Normal Schools nothing but the courses in the several subjects, (as in a Higher Elementary School) prescribed for the preliminary examination. No wonder that when he emerges out of the school, he is so helpless that he is ignorant of even the mechanics of the teacher's art such as drawing up suitable time-table and syllabuses, prepare clear notes of lessons with black-board summaries, submitting returns and maintaining registers and discipline among the kindergarteners by means of brisk, interesting and useful work.* It is gratifying to note that from this year onwards, a course in practical Rural Science with a rational co-ordination of sciences than which there is nothing more useful in Rural Schools has been substituted for the less concrete Nature Study and Garden work and arrangements for the introduction of Manual Training sections are also under contemplation though till now it has not gone beyond an aimless course in Drawing in almost all schools. No person is fit to be a teacher of a child if he cannot answer the common questions in natural history and physics which every healthy child asks and the regular school subjects cannot be made interesting or practical for the sons of agriculturists without constant reference to Rural Science. The mere attach-

* It would be well to admit hereafter for the Elementary Teacher's Training students with a higher minimum general educational qualification, and to include in the examination a course covered by a book like Richey's "Indian Primary Teachers' Manual" (Macmillan & Co.).

ment to every Training School of a nominal Agricultural Assistant whose mental equipment in his subject very often scarcely goes beyond the Botany Course of the Elementary stage of the Government Technical Examination, cannot at all compensate for the want of an agricultural graduate, so essential in a school where teachers have to be trained in such a manner that they may be able to arouse and awaken intelligent interest in the farmer-boy for his calling and enable him to rehabilitate village life and make the village a Bournaville or a Port Sunlight. Not only should the teachers themselves have a bias for rural things, rural life and ideas arising from rural surroundings, but they should also be able to create a kindred interest in the rural boys. But much rests with the enthusiasm of the teachers who are in charge of the work. Thus while the letter of the law appears good, the appreciation of the spirit is wanting, owing to the lack of patient study and information, a sufficiently high sense of conscientiousness in the discharge of duties and a feeling of unity and co-operation among the inspecting officers of Elementary Schools, with whom the responsibility of selection and training of pupil teachers rests.

5. Want of unanimity in the objects among the guardians in sending their children to these schools :--

When the present scheme of Elementary Education was set on foot, a clear line of demarcation has been drawn between it and Secondary Education. The Inspection Code says, though in the interests of the quality of Secondary Education, that it is very undesirable (except for really clever pupils, for whose sake the penalty

fees have recently been abolished) that it should become the custom for pupils to attend an Elementary School and then pass on to a Secondary School in the same place and that the inspecting officers should use all their influence to check such a procedure. This education, as the Right Honourable Mr. Fisher points out with reference to Elementary Education in England, is not to be considered as an end in itself but as a stage in the child's education destined to lead to a further stage. But to convince oneself of the absence in practice, of the one desirable aim, one has only to consider the bewildering multiplicity of the motives which prompt the farmers and workmen to send their children to school. One sends his boy not at all that he may become a better cultivator or a more intelligent citizen but to keep him out of mischief as he would be too small for 3 or 4 years to be of any use in agriculture or industry while at the same time, he might incidentally improve his powers of articulation and "retention" by a memorizing course of Balaramayanam and Amaram and pick up a few indigenous practical manipulations in the calculation of simple and compound operations in arithmetic. But however, he is removed when he becomes old enough to work, at any rate, before he can read and write correctly, so that he speedily forgets nearly all that he has been taught. Another says that he sends his boys to school in order that he might secure a E.S.L. Certificate and thus qualify himself for literate or semi-literate employment and to earn some small monthly salary to help the family budget. A third man says that even at the risk of some loss and personal inconvenience he intends to give his boy a *cheap secondary education* where he can have the chance of learning the rudiments of the English language though he does not

mind whether his boy gains any knowledge as to whether the earth moves round the sun or as astrologers say the sun moves round the earth, so long as his course assures him a passport for earning some livelihood. Another puts his son in school with the belief that if he learns to read and write letters and telegrams, he might be able to manage and preserve his forefather's estate a little better. Even an agriculturist or a gardener disdains to give his boy an organised course of training in gardening or agriculture partly owing to his own conservatism and partly owing to the want of sufficient practicality in the course, rendering it something quite apart from village life. The number of such improper motives is legion, and too superfluous for closer examination.

6. Literacy wrongly regarded a synonym for knowledge and education :—

In response to the demands of the educated few, the Government, also, through the system of aided and public schools have already indirectly made Elementary Education compulsory as far as is practicable and possible at present. Literacy is ordinarily believed to be only another term for knowledge and illiteracy for ignorance. "Even if the advantages of an Elementary Education" remarked Mr. Gokhale "be put no higher than a capacity to read and write, its universal diffusion is a matter of prime importance for literacy is better than illiteracy any day." But the consequence would be that many boys will leave with a very rudimentary knowledge of the 'Three R's' which in the atmosphere of an Indian village they will very soon forget. In his book "Across the Bridges" which is an illuminating review of the social condition prevailing in the poorer portions of S. London, Mr. Patterson tells us that even

there, many boys after several years of school practice relapse into illiteracy. If this is the case in the metropolis of the world, how much more will it be the case in India. "Do the Three R's in themselves" asks Lord Meston "make the cultivator a better man at his trade. Do they help him to grow two grains of wheat where one grew before? If our rural education does not effect these purposes, it is a barren gift. If it tends to uproot the rising generation from the soil, it is an evil. The remedy is one of the most urgent and vital of our educational problems." The prophet of Mohammadans confessed nay, even gloried in the fact of his being illiterate.* Sivaji not only could not sign his own name, but, says James Douglas, in his *Bombay and Western India* disliked writing and writing men, like Lord Lake.

† 'Damn your writing
Mind your fighting.'

7. The stupidity of educating every child in and the over-estimate of the Three R's ; no honest desire for education as a means of staying pleasantly in our place but only to gain advantage in a state of general scramble :—

At the same time none but the ignorant object to the spread of knowledge and enlightenment by first creating a genuine interest for it in the people. But we have to

* "I say, O men, verily I am the messenger of God and unto you all ; unto him belongeth the kingdom of heaven and earth ; there is no God but he, he giveth life and he causeth to die. Believe therefore in God and His apostle, the illiterate prophet, who believeth in God and his word and follow Him that he may be rightly directed."—*Sales Al Quran*, Chap. VII.

† Vol. 2, p. 340.

carefully consider what shape the future mass educational systems of the Government of India will have to take. Education has become a transferred subject and if we want to shake ourselves free from unhealthy traditions, it is quite essential that those of our countrymen who are earnest about improving the present condition of our educational system, should have definite views as to how primary education, the foundation of all education should be reformed and placed on a better basis. The President of the British Medical Association, Sir J. Barr at a meeting of the Liverpool branch of the Eugenics Education Society, strongly condemned the modern stupidity of educating every boy and girl in the Three R's, regardless of their natural fitness. Sir J. Barr is by no means the first to protest against the "Three R's." A good many years ago, the late Prof. Hodgson of Edinburgh published an appeal against 'The over-estimate of the Three R's, in the English Education system. And long before him, at the very time of the passing of the English Educational Code which made the Three R's the "be all and end all" of Elementary Education, Ruskin despised and relegated them to a very subordinate place in his own schools of St. George's Guild. "I do not choose" he wrote "to teach (as usually understood) the Three R's; I do not care that St. George's children, as a rule, should learn either reading or writing, because there are very few people in this world who get any good by either. Broadly and practically, whatever foolish people *read* does *them* harm and whatever they *write* does *other* people harm." One of the lady companions of the guild ventured to promise the teaching of the Three R's upon hearing which, Ruskin wrote to her privately, asking with some indignation whether she had never read his injunctions to the con-

trary, to which she answered that "Inspectors of Schools now required the Three R's imperatively." Ruskin was beside himself with anger and answered her with indignation at high pressure that ten millions of Inspectors of Schools collected on Cadres Idris should not make him teach in his schools, come to them who liked, a single thing he did not choose to.

It is a well known fact that people do not desire education for the cultivation of common sense but because they believe that when they have got it, they must become upper orders. A ploughman wants to become a minister and the villager sometimes takes objection on this score to send his boy to the school as it disinclines his child from hereditary pursuits. Hitherto this has been the real cause of failure in all attempts at Mass Education that there is no honest desire for the thing itself. "There is a strange notion in the mob's mind, now-a-days, (including all our popular political economists and educators, as we most justly may, under the brief term 'mob')," says Ruskin "that *everybody* can be uppermost; or at least that a *state of general scramble*, in which *everybody* in his turn should come to the top, is a proper Utopian constitution; and that once, give every lad a good education, and he cannot but come to ride in his carriage — (the methods of supply of coachmen and footmen not being contemplated). And very sternly I say to you and say from sure knowledge that a man had better not know how to read and write than receive education on such terms. The first condition under which it can be given usefully is, that it should be clearly understood to be no means of *getting on* in the world but a means of *staying pleasantly* in your place there."

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8. Difficulty more pronounced in a country where the question of social organization has been solved by means of the caste system. Though the system undoubtedly needs reform yet the factor has to be duly appreciated and not ignored. Elementary Educational scheme, mainly a matter of rural areas.

Who is so simple as to believe that the lower orders in India desire education as a "means of staying pleasantly" in the place in which they are born, and not to get a chance of "getting on" in a state of general scramble? Of course, by keeping the lower orders in their place it is not to be understood as an argument for the continued dominance of that particular social caste which is called the better class. Who then would dare to deny that this motive of getting on, at all costs, bad as it is in any part of the world is calculated to work greater mischief in India on account of the caste system?

All civilised countries, particularly India, are suffering from an overcrowding of the professions. The main reason of this lies in the ambitions of the people to get socially better. This is a most dangerous state of affairs. The economic basis of a nation is the directly productive part of it, *viz.*, that actually engaged in separating out the materials of life from nature and that concerned in adapting those materials for human consumption.

The professions arose from prosperity of the Trades. Over-stocking of the productive trades merely makes the basis of society unnecessarily strong. Over-stocking of the professions breaks down the whole structure. In fact, the professions are by nature the work of the wealthy classes.

This is the result of a system of free education which has made it possible for a child of the productive classes to qualify for the profession naturally followed by the child of one, successful in that class and now one of the wealthy classes. Hence the unhealthy demand on the part of the productive classes for a free professional education modelled on the education of the wealthy professional classes so that the sons of parents engaged in productive work may become professional men; and they are to become professional men irrespective of their absence of private means to supplement the nominal professional salary and irrespective of the ability of the community as a whole, to afford more professional men. As a result the best of the productive classes are drawn away to become superfluous competitors in the professions. The brains are drawn away from the productive workers and the children of succeeding generations shrink from this type of employment. So if the group of directly productive activities or trades are to be adequately represented, the best endowed children of that class must be kept there: (1) by making such useful education attractive, and (2) as Mr. West puts it, "*by making it impossible or at least extremely difficult for anyone of that class to adopt or enter the professions,*" *i.e.*, it should in the interests of society, be an expensive process, a difficult process, a long process. The education of the wealthy classes is cheap being a largely "pen and paper" education. But the fees paid are large and this expense ought to prevent a rush. The education of the working classes is expensive being technical but it is generally free or worked on stipendiary system and this should be compulsory and widespread.

It is suicidal form of philanthropy to wreck the edu-

cation of a nation to please the ill-informed snobbishness of a small section of its best citizens.

Now it would be convenient to divide India into rural and urban areas. Let us cast a passing glance at the present state of voluntary elementary education in both kinds of areas. As far as the urban arrears are concerned, I believe it would be difficult to find a town through the length and breadth of India, so small and thinly populated or so poor and decayed that it has not even one elementary school in it and consequently for all practical purposes, we might say that voluntary education prevails in urban places of India. And nothing surprises one more than to find on enquiry that it has spread in quarters least suspected by the casual observer; in fact, it is taken advantage of by the sons of every class of people in the town except of the lowest and of the unsettled day-labourer from the stall-holders and petty artisans to mill-hands and domestic servants and even coolies. But when we turn to rural areas, the question seemingly assumes a different aspect and facilities for Elementary Education in those areas are apparently deplorable. The majority of the people of India being mainly agricultural, for most of their practical needs of life are not required to read, write and reckon.

"The attitude of the agriculturist towards education is one of stolid indifference" wrote "*The Civil and Military Gazette*" sometime ago. "In many parts of the Punjab he shows no inclination to be hustled. In spite of the fuss which is being made around him, echoes of which must reach him, in spite too, of all facilities, the proportion of pupils who are the sons of agriculturists remained about a half, as before." Some Inspectors of Schools

in the province reported that among the agriculturists "tending cattle is preferred to education." The same complaint comes from the United Provinces that Lower Primary Education is "unpopular with the villagers because of its evanescent character."

9. Caste consideration negligible only to lead to chaos :—

Nothing would be dangerous, with the organisation of society such as we have, than the awakening in the mind of the mob a desire for a state of a general scramble. For if the lowest class came to understand the degrading nature of the work they are at present uncomplainingly and even cheerfully doing, they would be more than human if they did not protest against the apparent injustice of a system which casts them and their children for ever to be the sweepers and scavengers of the classes above them, and if they did not try to improve their lot by obtaining some work which would raise them, however slightly, in the eyes of the world. Now in the eternal constitution of the world, the work set apart for a sweeper and a scavenger can never be left undone and one set of men or another must be found to do it. If therefore, even a small number of men from the lowest castes, obtaining a free elementary education, is able to find some occupation better than theirs, their places will have to be filled up and can only be filled up by men drawn from castes immediately above them. But will the caste a step higher ever consent to do the work of the caste a step lower? Will any man even dream of such a thing. Even the lowest castes have such high notions of their descent that a barber would starve rather than do the work of a dhoby and both of these, far from consenting to do the work of a caste lower

than theirs, would think themselves positively polluted if a scavenger accidentally touched them. This is no mere conjecture, but a fact that could be ascertained any day; as much as the other fact that the class of farmers, whenever they have got the opportunity of educating their sons, have come to despise the plough to which they are confined by their caste.

Is it wisdom or is it foresight to awaken in the lowest classes desires and ambitions which, as circumstances stand can never be satisfied, but which must inevitably end in introducing into India social unrest and a feeling of dissatisfaction with one's environment of life—evils under which advanced countries, where there is a mass educational system of a literary type, are groaning. Both, therefore on theoretical and practical grounds, the fascinating scheme of mass education in the Three R's must be given up in India; for while the so-called social, moral and economic advantages, are after all, purely conjectural and extremely problematic, the disadvantages are very real and quite imminent.

On this point Mr. Freemantle has made some observations in his pamphlet on Rural Education. He says "If indeed the pressure of economic conditions is so strong or the demand for primary education so weak that no part of a boy's time after the age of eleven or twelve can be spared for the school, then we should surely pause to consider whether the time is yet ripe for the introduction of a system of general primary education into rural areas. It is a question whether we are not beginning at the wrong end and whether primary education can make any real advance before there is a substantial improvement in economic conditions."

10. Solution—Learning the calling for life, to be put to some useful work :—

(a) RURAL : AGRICULTURE :—Well then, how are we to deal with the question—education as suited to the rural classes? This end cannot be more effectively secured than by making, and *even compelling* the children of the lower classes to learn the calling by which they are to live. "I tell thee" says Mrs. Perring in '*Seems So*' "If you got to live your life with your nose to the grindstone like most of us have, the sooner you learn to put it there, the better. What wants altering is the whole spirit of elementary education." "The first condition of education" remarks Ruskin in a memorable passage "the thing you are all crying for, is being put to some *wholesome and useful work*. And it is really the last condition of it too; you need very little more." For instance in a village, as in the Danish Folk School, the most experienced farmer whose services are available should be given the charge of all the village boys of a certain age and he would be expected to make them in a given time fully acquainted with all the simple operations of the art of cultivating the soil. He possesses a certain amount of hereditary influence and power over the village community, of which no better use could be made than in exacting obedience from the pupils and obedience is the basis of moral training. Later on, they may attend a village school where they may be made to undergo a more systematic training in agriculture (particularly when the teachers are now being trained in agricultural schools) and taught the Three R's, so that they may introduce a better system of cultivation when they return to their own villages. On this matter Mr. Chatterton says :—

"It seems to me that properly constituted Rural Indus-

trial Schools will best meet the necessities of the case, but if much good is to be derived from them, it is necessary that they should be numerous and evenly distributed throughout the country. There are probably but few Taluks in this Presidency which would not be immensely benefitted by the establishment of such schools in suitable localities where they will serve both as demonstration farms for the benefit of the adult ryot community and as schools in which their children can be trained in the best practices of modern agriculture. One hundred and fifty such schools would be one to every Taluk in the Presidency and one to every 150,000 acres of cultivated land. Probably these schools, when completely equipped would cost, on an average Rs. 10,000 each or Rs. 15 lakhs for the whole Presidency. The interests involved are very large and adequate means must be employed if really important results are to be achieved. In the main, I think it would be desirable to place these schools under the management of District Committees who would be guided or perhaps it would be better to say, directed, by an experienced officer appointed by Government. In part, no doubt, the funds could be raised by local subscriptions and possibly Government might be able to make considerable advances under the Agricultural Loans Improvement Act. Several years would necessarily be occupied in the establishment of these schools, and if the initial outlay were provided, I think it quite possible that the District Boards would be able to find the money to maintain them. It must be remembered that they are to be practical institutions and that *their object is to deeply influence,*

in a beneficial way, the agriculture of the Districts. If they achieve their objects, the expenditure on them will be but small compared with the benefits that will be obtained, and the most impecunious District Boards may well consider that they are laying out the funds at their disposal to the best possible advantage, when they are expending them in a direction which is likely to bring about a material increase in the wealth and resources of the District.

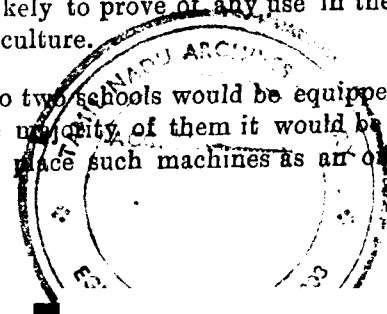
The Rural Industrial School will bear but little resemblance to existing institutions which are all situated in Urban localities. The head of it should be an agriculturist, a man well versed in the best methods of cultivation that are possible in the District; not necessarily a graduate of the University or even a failed matriculate. His qualifications should be of a practical order and he should understand not merely how to farm, but how to do so with profit. He would be provided with a *house and entitled to a share in the produce of the farm* so that his actual remuneration in money would be comparatively small. Similarly with the assistants, farm labourers and pupils. Each and all of them would live on the farm, would enjoy the usual luxuries of an agricultural life and would receive their pay or remuneration almost entirely in kind. At the outset, at any rate, it would be extremely undesirable for either the Farm Superintendents, or the other employees attached to these agricultural schools, that any of the provisions of the Educational Department should be made to apply. Later on, when they have become firmly established and their value recognised throughout the country, it will be wise no doubt to try and

increase their efficiency by insisting upon the possession of general educational qualifications both by the staff and the students. *But at the beginning the main object will be to influence the ryot and that can only be done by practical demonstrations which can be clearly understood and appreciated by unlearned and ignorant people.*

In selecting a site for one of these Rural Industrial Schools, I regard an ample supply of water as the prime necessity of the case and it must therefore be in a place where there is either a good supply of well water or a water-course from the sandy bed of which an ample supply can be obtained. For raising this water the school should be equipped with an oil-engine and centrifugal pump and in places where the meteorological conditions are favourable, with a windmill and reciprocating pump. Round the school there should be a sufficient area of land to utilise in the most profitable manner possible all the water raised by both the engine and the windmill. As the smallest sized engine which can be recommended for pumping purposes is one which is capable of irrigating at least 35 acres of land, this practically fixes the minimum required of the school both as to land and water-supply. But where an ample water-supply exists there is no reason why the school should not be equipped with a much larger engine or in some cases with more than one engine, and if the area of the land which can be cultivated by this engine is larger than can be conveniently managed by the school authorities, it will be extremely desirable to sell the surplus water to neighbouring cultivators if they are willing to pay for the same. The land

attached to the school as far as possible should be cultivated by the pupils of the school. It should be treated as a farm working on commercial lines and *experimental cultivation should be considered quite a secondary matter.* The object should be not to improve cultivation so much as to demonstrate the possibilities of the best known system of cultivation. Besides the agricultural class, there should be only one industrial class in the school and all the pupils should go through the same course of training. The object of this class should be to turn out mechanics or artisans who will be capable of managing all the improved implements of agriculture which by experience it has been found, may be profitably introduced. There should be instruction both in carpentry and iron work and the object should be *to turn out carpenters and smiths and not cabinet makers or fitters.* In the wood shop, the boy should be taught house-building, construction of carts, wheels, ploughs, seed-drills, water-lifts and any other appliances which will be useful to the agricultural community. In the blacksmith's shop they would undertake all kinds of miscellaneous repairs. They would make axles for carts, tires for wheels, mamotees, junipers, ploughs, reaping knives and hoes and would be familiarised with the use of machinery. The boys would also be taught to manage all kinds of machinery, which are likely to prove of any use in the furtherance of agriculture.

And though no two schools would be equipped exactly alike, in the majority of them it would be probably desirable to place such machines as an oil press, a



sugarcane mill, vacuum pans for the extraction of sugar, a winnowing machine, a chaff cutter, and a cotton gin, besides other appliances which might be considered to be specially suited to local agricultural requirements. The wind-mill should be regarded as a supplemental source of power to the oil engine and the latter might easily be arranged to drive such of these machines as require more than a small amount of power. I would not only allow, but would distinctly encourage the ryots in the district to make use of these machines; to bring their oil seeds to the press to have the oil extracted; their sugarcane to the mill to be crushed or their cotton to be ginned; I would charge them just enough to cover the actual cost of these operations, so that they might learn by practical experience the advantages of these machines. For instance I would extract castor oil from the seed and receive the poonac or oil cake in payment for the work. The seed-cake I would use as manure for the land probably where sugarcane was cultivated and when the same reached maturity, I would crush the cane and return everything to the land except the actual sugar. The elements entering into the compositions of oil and sugar are ultimately derived from the atmosphere and such a system of cultivation would therefore deprive the soil of none of the constituent elements essential to the healthy growth of the crops. In some cases the schools would be in localities where wells are numerous, and as the first step towards the improvement of the means of raising water, the school might undertake to maintain in order water-lifting appliances belonging to the adjacent ryots. Under such a

system it would be possible to give the double mhothe a proper trial and many improvements could be introduced into the water-bags which are now such a fruitful source of worry and trouble to the owners.

Either by growing them on the farm or by supplies derived from the immediate neighbourhood it would be possible to obtain all the more valuable Indian fibres, and in the school the machines for extracting them could be made and the methods for using them demonstrated. In some districts it would be desirable to go in for silk culture, to grow the mulberry leaves or other food suitable for silk worms, to rear the worms and to introduce better processes of silk winding. Mr. Tata of Bombay has established an experimental silk farm at Bangalore and a good deal of valuable experience and information has been gathered by the Japs employed there to look after the work. He has introduced Japanese methods of culture with results which are, I understand, very satisfactory in many respects and from a personal inspection of the process, I am certain that there is nothing in the system adopted there, which could not easily be carried out in any place favourable to the culture of silk-worms. It will thus be seen that these schools will be places for demonstrating the best practical methods of obtaining the proceeds of the soil and manufacturing these products into commercial commodities with as little waste both of raw materials and energy as is possible.

More directly connected with the agricultural side of the school than with the workshops, would be the

gardens, orchards, poultry yards and stock yards which I should like to see established and in nearly every case, I think it would be desirable to run a small dairy for the purpose of manufacturing butter and ghee, any surplus of which may be exported to places where it would command a fairly ready sale. I do not presume to suppose that it would be possible to carry out all the suggestions which I have made in any one place, nor do I consider that it would be feasible to start them all at once. I would commence operations by providing the water supply and selecting the site of the farm and it is in this matter that our experience is the least and the chances of mistakes the greatest. At the outset there would be considerable difficulty in obtaining suitable persons to manage the farms and control the work-shops, but those are difficulties by no means insuperable and would greatly decrease as experience accumulated and the success of one venture after another became assured. I have already stated that the establishment of such schools would require on an average, a capital outlay of Rs. 10,000 but if they were properly worked, the returns from the farms and from the workshops would meet, if not the whole yet a very considerable portion of the working expenses. Herein really lies the root of the whole matter. For, if, when these schools are properly established, they cannot be made to pay their way, they must be regarded as failures. No ambitious agricultural programme is to be attempted. All that is to be taught is good farming and the management of agricultural machinery and of only such agricultural machines as, with fairly skilled

mechanical labour, an advantageous use can be made of in this country. In garden cultivation, in fact in all cultivation under wells, the cost of raising water and of applying it to the soil is, by far the heaviest item of expenditure and since in these schools this item would be at least one-half of what it now is to the ordinary ryot, the margin for successful working is a fairly wide one. Under proper management no difficulties should be experienced in making both ends meet. Such schools will, I am sure attract the attention of the larger shareholders and men of wealth in the districts and I am pretty certain that if suitable accommodation is provided for them at or near the schools, they will visit them in large numbers for the purpose of gaining practical information regarding the working of the various appliances which it will be one of the objects of the school to introduce. In this matter it seems to me not improbable that they might be induced to subscribe among themselves the necessary funds to provide for their own accommodation. Now what will be the result of all this expenditure? And will the ultimate results justify the application of so large an amount of capital? It must be remembered that the interests affected are the most important in the country and represent by far the greater part of wealth of the people. One hundred and fifty farms with an average area of 40 acres each would cover but 6,000 acres of land and would be but approximately $\frac{1}{4000}$ th part of the total area under cultivation. Fifty windmills and 150 oil engines may seem a fairly large number but their total horse-power would be less than thousand as

compared with about a quarter of a million horsepower which expresses the total capacity for work of all the cattle now employed in this presidency in lifting water. Thus it will be seen that, though I advocate a large expenditure when measured in absolute figures, yet, relatively to the interests involved it is comparatively small, and it may therefore be fairly assumed that even comparatively trivial results may become of importance when spread over so wide an area. "In the first place, I think, that not a few of the ryots will send their sons to the schools to go through a course of practical training on the farms and to pick up a little mechanical knowledge in the workshop. In the second place, the schools will be able to supply the districts or taluks in which they are situated with improved tools of local manufacture and of such design as experience has proved will suit the requirements of the ryots. If the results of lifting water by mechanical means prove satisfactory and they can hardly fail to do so if the site in the first instance is carefully selected, it will induce some of the wealthiest landed Proprietors and Zamindars to set up similar installations on their own property and they will the more readily do this when they find that without difficulty they can secure the services of competent men to look after them. Gradually the number of these installations will increase and though it may be taking a somewhat sanguine view, it does not seem to me to be utterly beyond the bounds of possibility later on to imagine that combinations of ryots may be formed to provide themselves with these means of extending their cultivation for which individually their capital is insufficient."

(b) URBAN AREAS: INDUSTRIAL SCHOOLS FOR THE MASSES. HANDICRAFT.—With regard to Urban areas also similar arrangements can be devised suitable to local conditions. Mr. Wallace, Editor '*Indian Textile Journal*' says:—

"If we may rely on the evidence of Mr. Nesfield, Director of Public Instruction in the North-West Provinces, the Three R's were not of much use. He found that Primary Education made the children of the cultivators less contented with their lot in life, less willing to work and more litigious. He persuaded 1,037 old pupils who had left school for sometime to present themselves for examination and of these 16 per cent. passed in one or more simple subjects (reading, writing, and arithmetic) and in one or other of the three more difficult grades, while the remaining 84 per cent. failed to pass in any one subject. The instruction given them appears to have been of no use in their daily work, and they forget their schooling as people forget the things they do not practice. Education did not make them better agriculturists because their instruction did not include anything directly bearing on agriculture. It was also made clear that the short receptive period of the lives of these youths had been sacrificed to a system borrowed from another and totally different country. The incident took place 24 years ago and, although object lessons have since been introduced rendering the tuition more interesting, reading and writing continue both to be taught to and forgotten by the bulk of the pupils. The teaching of five boys to read, in order that one might remember the art, indicates very peculiar ideas on the subject of Education.

The Primary Trade School can only be opened after teachers of handicraft have been trained in a special class.

Taking wood-working* by way of example, they should be able to teach the following subjects:—

Free-hand Drawing and Arithmetic as applied to the Carpenter's Craft.
The use of the Foot-rule in correct measurement.

The Reading of the Clock.

The use of the Mallet and Chisel as an introduction to the study of cutting edges.

The use of the saw for exact work, i.e., cutting out a pencil line on both sides of a piece of wood. This is soon acquired when the saw is in good adjustment. The exercises should include working with the saw in the usual state comparing the time occupied in doing the same amount of work with each saw. As the saw is the most neglected tool in the kit of an Indian workman, special care should be given to this subject. The pupil would finally learn to sharpen and set the teeth of saws.

The systematic grinding and whetting of cutting tools would follow with the comparison of the time used at the grinding stone and at the fast stone (lisano) generally used. Edges sharp and dull would be examined by a watchmaker's lens and comparative working tests would be made of sharp and dull tools.

Tests of the Strength of Wood.—These are made with various samples of wood of similar size resting on supports and loaded in the middle with a bag filled with stones until they break. Instruction should at the same time be given on the qualities of the samples tested.

The Holding Power of Nails and Screws—The lesson is taught with the aid of a nail puller and a bag of stones, the wood being held in a vice. Experiments are made with bright and rusty nails and with screws. Screws as driven in India have often less holding power than nails. In this lesson, the shape of the point of a screw driver is explained.

A Correct use of Planes and their Adjustments—This work is taught partly by demonstration by the black-board and partly by the graduated exercises.

*Vide *Manual Training for Secondary Schools in India* by Mr. A. H. Mackenzie, *Manual Training for Indian Schools* by Mr. J. Y. Buchanan, (Indian Press, Allahabad) with an Introduction by the Hon'ble Mr. J. A. Richey, Director of Public Instruction, N. W. F. Province (Oxford University Press).

The Fitting of Hammers and Chisels:—If one may judge by ordinary examples, this subject calls for definite instructions of a simple kind.

Every school should possess examples of wood working machines made principally of wood to show how much a carpenter may do for himself in making machines of precision. I have for many years used a lathe made principally of wood in which sawing, screw-cutting and dove-tailing is done besides all the usual work.

(c) *A Short Course of Applied Geometry*:—Will be required in which it will not be necessary to talk of Euclid or the law of gravity. The making and testing of a wooden square, a straight edge and a plumb-level, the fixing of hinges & in line (as on a door) and exercise with the square, plumb-level and tape measure upon the walls, doors and windows of the workshop properly explained should form an introduction to the carpenter's art and a safeguard against many vague or erroneous notions which beset the ordinary worker in wood. This instruction should also render him more observant of any further useful knowledge that might come in his way; it would not be likely to run to waste for it would all be required by the future workmen.

(Similarly with regard to other crafts also See Appendix ii).

India has yet to recover from an educational impulse in the wrong direction. Reading and writing which have been of incalculable value to certain classes are not of use at all and they become positively pernicious when they entice young men away from a sure living by handicraft to the overcrowded ranks of clerical labour. A time will come when literary knowledge will be necessary to the whole population of India but that is the affair of posterity.

A new class of teachers is required with special training to meet the real needs of the working community and no man should be allowed to undertake class work who cannot furnish proofs of his ability to teach.

It may be that the school cannot teach the boy as well as he could be taught elsewhere. For example, suppose we find a Technical or Industrial School, with a view to

teach the children agriculture, pottery, weaving, oil making, etc. Some hold that no school could teach the children better than they are taught already. The methods are primitive, the ploughs are light and the ploughing is shallow, the looms are primitive. But the light ploughs suit the small cattle and the small cattle suit the climate and the circumstances of the cultivator. Even supposing that by improved methods a greater yield could be obtained, this greater yield would require more work from the cultivator. And perhaps the cultivator does not desire to give more work. He does not desire to become rich. His standard of comfort is low and amongst his comforts he may possibly number a certain amount of ease. In fact it has been said that the methods employed may not be so productive as other methods; but they are better suited to the circumstances. The father teaches these methods to the son. And in weaving the mother teaches the daughter. Possibly no school could teach them so well, certainly not better.

In the case where the boy cannot or does not want to "get on" if we take the view which is in too many cases a true one that all his life, he will be a willing or unwilling worker in his life's business and that this process cannot be taught at the school, what of the education then. If the school cannot prepare the boy for his life's work, then it may at least teach him to employ his leisure time that he may be a happier and more intelligent being in spite of his daily task. It will simply give him opportunity for following whatever valuable leisure employment, gives him most satisfaction.

This is very different from the ordinary primary school, different in method and different in curriculum and different in cost.

For the primary school includes many subjects which are not leisure subjects and it does not teach subjects as if they were leisure subjects. As Mr. West says "*one can not tell really what its purpose is.*" Let us then make up our minds either that we can prepare boys for the life's work, as well as *for the life's leisure and the life's duties.* If so, it is a happy thing for the country or if we cannot do this; let us make up our minds to it and put an end to all this waste of time and money which achieves no purpose. The time of the Elementary School can be shortened by half and we can apply ourselves, in the half that remains *to achieving a little more happiness after the untrained drudgery of the day.*"

Need for model Government factories, Morley's retrogressive step.

Lord Morley once said "industrial development is more likely to be retarded than promoted by the diversion to State managed commercial enterprises of funds which are urgently required for the extension of industrial and technical instruction," "The objects that we had in view can all be accomplished by means of Technical and Industrial schools. * It is in such schools that a knowledge

* The schools are sometimes called technical and sometimes industrial according to the fancy of the promoters. Mr. Chatterton says, "The humbler the name you give to the institution (i.e., the Industrial School) the less perhaps is expected from it and the more likelihood there is that what you expect will be attained. A technical school is one in which something more than the mere teaching of a trade is undertaken and at present, and (very wisely too) the efforts of industrial institutions are entirely confined to the teaching of trades in the way they ought to be taught and it would be better to leave things which are truly technical to other institutions which are better situated and have larger funds at their disposal for carrying them out. Mr. Wallace says, "One of the

new industries and new processes can best be imparted, that the use of new implements can best be taught and the technical skill of the artisans most readily improved. In a leather school, the method of chrome tanning can be demonstrated and taught; in a weaving school the indigenous handloom can be improved and the advantage of the improvement demonstrated. If the schools are properly managed they will supply the private capitalist with instructed workmen and with all the information he requires for a commercial venture. To convert the leather or weaving school into a Government factory in order to demonstrate that articles can be manufactured and sold to the public at a profit goes in my view, beyond what is desirable and beyond what is found necessary in other provinces."

"It was this view" says Dr. Slater, University Pro-

rarest things in India is to hear a definition of technical work. It is generally assumed to consist of a mixture, in no fixed proportion, of science and art; the science being mathematical, mechanical and chemical, and the technique the art of some kind of work in wood and metals. My earliest recollection of King's College, London, is the memory of a definition of physical science given by one of the masters. He said it was a form of knowledge that could be conveyed in writing and that could be tested experimentally giving the same result from similar premises. Technique is a word that has been appropriated principally by the exponents of fine arts and is used with reference to the work of sculptors, poets, painters, writers and actors, and in every case it means the distinctive finish of the work, the result of their method and talent and although it forms the chief object of criticism, it cannot be acquired by any amount of reading and is thus completely distinct from science. Technique is the strict equivalent of art and craft, it is the same thing expressed in words of Greek, Latin and Saxon origin and although nearly related to science, the idea is quite distinct. For example one may read all that can be written about hammering a nail, handling a saw, wheeling a barrow, riding a horse or swimming without acquiring

fessor of Economics, Madras, "that practically sent Sir (then Mr.) Alfred Chatterton the pioneer who demonstrated the possibility of establishing an aluminium industry, to take refuge in the State of Mysore.

I want to draw your attention to two obvious fallacies. In the first place, in writing about the diversion of funds from industrial instruction to industrial enterprises, Lord Morley confused between current expenditure and investment of capital. If the Madras Government invests a lakh of rupees on building and equipping a soap factory, it does not follow that it will have to withdraw a lakh of rupees from its expenditure on technical education or on any other necessary annual expenditure. As there is every reason for supposing the venture would be successful, it is probable that there will be more money, not less, available for technical education.

any one of these arts but the most illiterate man may become expert in them all by sufficient amount of practice. A technical school is literally one where science is not taught; a school where science and craft are mixed is a trade school (*we have now one in Madras*) and to organise a trade school properly, the most important directing influence should be that of men having an intimate local knowledge of the trades intended to be taught. The confusion of the terms technical and scientific is exemplified in two institutions in the Bombay Presidency. In the College of Science (Engineering College), Poona, various physical sciences are taught and illustrated by means of work in wood and metals for the training of engineers of roads, bridges and canals. In the Victoria Jubilee Technical Institute, Bombay, various physical sciences are taught and illustrated by means of work in wood and metals for the training of students in mechanical or electrical engineering and textile work. It is not easy to guess on what basis the titles of the two institutions were chosen but they illustrate the popular acceptance of the terms Science and Technique. In Manchester at the present time a project is being discussed for the establishment of a technical library. A library of applied science is probably what is meant."

But a far worse mistake was made in supposing that technical education can be effective if suspended in the air, as it were, with no connection with any existing industry. When Lord Morley said "it is in such schools" i.e., schools not associated with any workshop experience "that a knowledge of new industries and new processes can best be imparted" he was saying the exact opposite of the truth as any one experienced in technical education will tell you. Besides, supposing young men could be taught in Madras schools, the process of a new industry, what encouragement would there be to them to take the course with no chance of employment afterwards."

"In the education either of the lower or upper classes" justly remarks Ruskin "it matters not the least how much or how little they know, provided they know just what will fit them to do their work and to be happy in it. A man is not educated in any sense, whatsoever because he can read Latin or write English or can behave himself in a drawing room; but he is only educated, if he is happy, busy, beneficial and effective in the world. Millions of peasants are therefore at this moment better educated than most of those who call themselves gentlemen; and the means taken to educate the lower classes in any other sense may very often be productive of a precisely opposite result.*

11. Dissatisfaction with labour and lot in life;

* The Stones of Venice—111, App. vii. This explains why Sir George Birdwood calls those illiterate peasants living in the village communities of Western India "the most literary peasantry in the world not excepting those of France and Scotland."

want of practicality and distaste for manual work; swelling ranks of discontented clerks:—

Let our educationalists lay to heart these wise words of Ruskin. They contain the substance of all possible objections against the *fatal* system of educating each and everybody in the Three R's. Its danger lies in unconsciously cultivating in the lower classes a distaste no matter to what little extent—for pure manual work.

Much of the suffering of the lower orders in Western countries is due to identifying education and knowledge with literacy. When England herself in Fisher's Bill has combined the instruction in the Three R's, with vocational training in her Primary Educational system, the scheme of mass education based on the Three R's to a country like India with her peculiar organisation of society is highly undesirable.

"The cry for the education of the lower classes which is heard every day more widely and more loudly" remarks Ruskin "is a wise and sacred cry, provided it be extended into one for the education of *all* classes with definite respect to the work each man has to do, and the substance of which he is made. But it is a foolish and vain cry, if it be understood as in the plurality of cases, it is meant to be, for the expression of mere craving after knowledge irrespective of the simple purposes of the life that now is." A Board School girl in America who was remarkably well up in her geography and astronomy, when asked if the ground in her mother's backyard was a part of the earth's surface was unable to answer; and a good deal of the knowledge of our average matriculate is not much better than that of the little American girl.

There is thus little wisdom in the policy that advocates the teaching of the youth of India whether he be a

middle class urbaner or rural labourer, child or adult, the shapes of letters and the tricks of numbers irrespective of the calling by which he is to live.

THE CO-OPERATIVE SYSTEM:—In America some schools have made arrangements with large business houses to buy the products turned out by the scholars, who are allowed to work a certain part of each day and are given the proceeds of their labour done in the school-room. Where it is not possible to give education in the school like this, the effort is made to impart it by means of what are called *continuation schools* or *night schools*. To illustrate the earning capacities of the educated and the uneducated working people, the following calculation made by a comparative study of American conditions, may be carefully perused. The average annual earnings of 50 weeks has been capitalised at 5 per cent.

(a) *It is only such elementary education that is paying*—Of 166 school boys in Brooklyn the calculation was made till they were 30 years of age. The average income of each was \$1,253.05 per year, while of the illiterate workers it was \$500. If the parents of these 166 boys had bought each of them an annuity equal to the extra \$753 per year, which his education enabled him to earn, it would cost over \$753 × 20 \$15,000. As the salaries of these boys will rise considerably after they are 30, while those of the illiterate labourer will not, it is obvious that this elementary education was worth more than \$15,000 capital safely invested for each boy. If we take the life expectancy of the average schoolboy to be more than 40, and if the school life be one of twelve years of 180 days each, we see that every day at school is worth 9 dollars.

$$\frac{(40 \times 1000) - (500 \times 40)}{180 \times 12} = \text{nearly } 9$$

(b) *Unschooler workers have to go to the wall finally*—Out of 100 uneducated labourers at a factory only 35 per cent. unskilled remained, 5 per cent. went somewhat higher, 40 per cent. had to be dismissed and 20 per cent. left the business.

(c) *In Agriculture too*, it may be of interest to note that higher education of an American farmer with particular attention to his craft, has materially influenced his economic prosperity. The farm proprietor in the United States, as our travellers to America assure us, is very often a graduate of an agricultural college and sometimes marries a woman with similar qualifications. He scarcely allows the middleman in the guise of an absentee landlord to come in between the state and the cultivator. They have realised the significance of the fact that no college graduate within their experience has ever been reduced to the position of a renter. Warren and Livermore of Cornell made a study of 1,303 farmers in 4 townships of Tompkins County, New York and they found that only 17 per cent. of the renters had more than the District School education.

Of 1,007 with District School education

the average annual income was ... \$318 per year.

Of 280 with High School education ... \$622 per year

• Of 16 with College education ... \$847 per year

Of those with High School education, 20 per cent. were making over \$1,000 per year, while only 5 per cent. of those with District School education were making that much.

If the young American farmer is advanced as much as to improve his position by higher education in agriculture, why should not the Indian farmer boy be made to profit by being educated at least in a vernacular school in

Rural Economics and Hygiene, Science, Agriculture and Gardening.

12. Special difficulties in Rural Schools :—

Now the subordinate Inspecting Officers should use all their ingenuity to carry out in letter as well as in spirit the elastic scheme which has been aimed at in drafting it. One main cause of the helplessness and incompetence of our agricultural classes is the fact that they work only for about a month or two in the year *i.e.*, during the cultivation seasons of sowing and reaping and for the rest of the year they have no occupation. The result is that they have to maintain themselves for one whole year on the labour of a small portion of the year. And that labour is of the crudest and most untrained character. If they can be taught improved and up-to-date practical methods of agriculture in addition to some cottage industries which will enable them to find useful occupation during the intervals of agricultural work it will help them to earn a more assured and decent livelihood and to become more efficient and useful citizens.

The Elementary schools that stand out in the country parts at present cannot be said to have turned any body better than men trained only in Three R's and eligible for petty professions. The parents of village children of the poorer classes cannot afford the luxury of paying for the upkeep of their children at school, when those children, if they are not shut up in the school, can earn something by grazing cattle or doing odd jobs and thus add in howsoever small a degree to their parents' income. It will be a double loss to them to send their children to the ordinary village school. When Education is practically so cheap as in Board schools, if at the same time

the poor children are maintained in the school on the produce of land (when they can at the same time learn agricultural work practically) and the parents are relieved of the burden of maintaining them (particularly when they are themselves out of employ in their old age) the latter may not complain if the children are taken away to be taught something which will help them to earn a better living than they are themselves able to do. Public benefactors may be educated to start residential schools where handicrafts, etc., the handloom weaving, the making of rugs, carpets and blankets; bamboo rattan and cane work, mats and baskets, wood and metal work; work in earthen-ware, the tanning of leather and hides, dyeing and painting processes, the preparation of perfumes and oil extraction and where possible paper, pencil, sugar, fibre, match and jute manufacture, may be taught in the country parts in order to enable village children to grow into efficient and useful men; an experiment of this kind seems to have recently been undertaken somewhere in South Malabar. (For Urban Elementary Schools Capt. Patavel's Self-Supporting School in Bengal *i.e.*, the Polytechnique Institute of the Maharajah of Kossimbazar may serve as a model.) It is the population of the country parts whose occupation is agriculture and who constitute the backbone of the country that should know the spirit of modern progressive life, their standard of life raised, their vitality increased, themselves made more efficient and vigorous and enabled to make better use of their lands and time, and their natural powers.

13. Rural Science :—

†Mr. Fisher, the Minister of Education in England in the course of his address at Plymouth on the *Educational*

Outlook, said: "I have often said that our system of education in the village schools of this country is bad. Well, if it is bad by all means improve it. Do not let us despair of education in country districts, because it has not realised all our ideals as yet. It is quite obvious what the lines of improvement should be. I am very much interested myself in the improvement of rural education."

How are we to improve our rural education? Well, one great instrument of improvement is the School Garden. Since I came to the Board I have been encouraging so far as I can the development of school gardens in country schools, for the purpose not only of instruction in gardening, instruction in plant life but also for the more practical purpose of enlisting the labour of school children in the production of food during the great national necessity. I should like to see in every village school a school garden. Then there is Nature Study in the classroom itself. This is part of our rural curriculum, and in some places, this Nature Study lesson is given very well and in other places it lacks quality.

Napoleon used to say that a country priest ought to know three things—a little agriculture, a little law and a little medicine in order that he might be able to give useful advice to the peasantry. Now I say, that a teacher in an English country-village ought to know a little gardening, a little agriculture,* a little mechanics and a little

* But to avoid misunderstanding, it is here necessary once and for all to define the meaning of the term "agriculture" as it occurs in the scheme of an Elementary School. It can be best understood from such simple agricultural lessons as are given in a book like "Nature Study and Simple Agricultural Teaching for the Primary Schools of Burma" by Mr. Thompson, Deputy Director of Agriculture, (Longmans) which largely partake of the nature of Nature Study or Rural Science lessons. Agricultural lessons cover a wide

political economy. I should like to see him able to talk about crops with the farmer upon equal terms; I should like to see him able to mend an agricultural machine, and to show what was wrong with it; and I should like to see him also able to start a co-operative society and to know something about the co-operative movement."

range of subjects, *via.*, Forestry and Arboriculture, Fruit and Horticulture, Mycology and Entomology and Rural Economics. They do not pretend, exhaustively to describe the processes of tillage though they may contain many useful hints. The methods prescribed for teaching them indicate that together with the other lessons on common objects, they answer to the *Anschauungsunterricht* or the *Heimatkunde* and *Naturkunde* that form so important a feature in continental education and which are framed to give the children right ideas about the things they see around them, to awaken in them the faculties of interest and observation and to teach them to express their ideas in proper language. If they serve to electrify a pupil's mind into the observation of that which is around him, the building up of a reasonable experience, the formation of general ideas and the drawing of rational conclusions—then, indeed, the best will have been accomplished. The aim of the teaching should be to train each boy to observe carefully and to reason correctly from the observations which he makes; to train the hand and eye by using them in doing things; and to foster an outdoor interest in the things of Nature. Instruction of a farmer's son to be effective, should begin with the vegetables, the fruit he eats, the flower he smells, the plants in the neighbourhood of his dwelling, with the crops grown, with the trees found, with the animals he sees, in his native village. This will, as he observes from day to day, make him think why a seedling has not come out of a chulam seed he has sown; why a flower fades; why a plant withers; how a watering makes a plant put on a cherry face; why with the hot sun a plant droops, why at sundown the rain-tree leaves come together. The Government of India in paragraph 21 of the famous Education Resolution of the 11th March 1904 state that "The aim of the rural schools should be not to impart definite agricultural teaching, but to give to the children a preliminary training which will make them intelligent cultivators, will train them to be observers, thinkers, and experimenters in however humble a manner and will protect them in their business

The programme for the improvement of rural education sketched above by the Minister of Education appears at present to be more needed to our schools than for schools in England which we generally regard as almost perfect and the very fact that they are undergoing a wonderful change at this time, though apparently con-

relations with the landlords to whom they pay rent and the grain dealers to whom they dispose of their produce." It is not an agency for teaching the agricultural population how to conduct their business. Mr. Sly, I.C.S., (now Lieutenant-Governor of the Central Provinces) the Officiating Inspector-General of Agriculture in India in commenting on this in his note of 1906 on Indian Rural Education, says :—"Now I have no vain aspiration that the rural school should aim at producing expert agriculturists versed in the agricultural science; its object should be to produce cultivators with their intelligence better trained than that of their forefathers, whose great hereditary knowledge of agriculture is based upon centuries of experience rather than upon intelligent reasons. Any attempt to teach scientific agriculture or indeed to teach agriculture at all, is bound to end in failure. The scheme put forward for Bengal in the Government's resolution of the 7th February 1905, excellent in many respects, seems to me to err in making agriculture a separate subject of study in classes II and III. It cannot be too often insisted that this system of education in its relation to rural schools is a method of study and not a subject of study. The difference of attitude has been well expressed by Professor Bailey :—"When the teacher thinks chiefly of his subject, he teaches a science; when he thinks chiefly of his pupils, he is teaching Nature Study." In the Central Provinces readers which serve at the same time as text-books in Elementary Agriculture are a success but Bombay tried the scheme and in 1912 abandoned it. Now, there has again come over a change of outlook in regard to this matter. It does not stand to reason that instruction in the principles and the best methods of agriculture should not be practically given in a Rural School, when it has been found desirable to train boys, above nine years of age industrially in the Trade School. The Government have therefore ordered that suitable text-books in Agriculture be written for the needs of the schools. Messrs. Macmillan & Co., has just issued a Reader for Agriculturists prepared by D. Clonston, M.A., B.Sc., C.I.E., Director of Agriculture for the Central Provinces.

tradictory, only confirms the view that we have got to overhaul our systems. It is impossible however to expect, and unreasonable to demand sudden changes on an extensive scale. It is true that method is necessary only in so far as it is conducive of producing effective results but at the same time ample opportunities should be afforded for the development of the children's faculties and powers of expression and observation and the arousing of a taste for rural science.

14. Variety due to adaptation to local circumstances :—

Every school is required to have a curriculum suited to local needs and circumstances and (syllabus) courses of study drawn up in detail to suit the curriculum on a concentric basis with provision for monthly and annual revisions, both duly approved by the Inspector of Schools and which the subordinate Inspecting Officers are required to scrutinize in the course of their annual inspections. It is not uncommon that for want of revisions and sufficiently extensive work, even elderly boys sometimes remain in the same class over and over again without becoming fit for promotion. Thus many types, of schools for boys are possible, viz.

(1) For Children.

Schools in urban areas where factories etc., are situated.
 „ coastal areas.
 „ rural areas.
 „ agency tracts.
 „ for defectives.
 Reformatory schools.

(II) For Adults

Night Schools.

Gaol Schools.

Working-men's institutes.

15. Village Sanitation :—All divisions of the general knowledge subjects should receive particular attention along with the Three R's in every school. Lessons on Rural Hygiene and Sanitation, *e.g.*, the danger of vermin like the louse, the fly, and the bug; the importance of cleanliness; the mosquito and malaria; the care of teeth; contagious and infectious diseases; the hygiene of diet; exercise and clothing; the guinea-worm disease and the value of pure water; welfare and infant mortality; the mischief of quacks, drugs and patent medicines, as also the limited preventitive measures recommended by Bacteriologists for combating diseases like Hydrophobia, Influenza, Dysentery, Cholera, Plague and Typhoid fever, should be given by medical men in a very impressive manner with the use of lantern slides. The advanced students of Secondary Schools and Colleges may be made to form themselves into Social Service Leagues* and be induced during vacations, to improve the housing and sanitary conditions of the neighbouring villages by organising Co-operative Societies for the purpose, and popularising the leaflets of the South Indian Health and Welfare Association. The people might thus be encouraged to open modest and useful village libraries. (See Appendix vi).

*Suggestions for Social Helpfulness by the Rev. Dr. D. J. Fleming, (Natesan).

16. Practical Nature Study, Floriculture & Vegetable gardening in Schools : Physical Recreation :—

To one truly imbued with the spirit of the kindergarten (though all its gifts may not be suitable in our rural schools) school-gardening is the most useful instrument. It is also essential to the success of the garden as well as desirable on other grounds that a small house with a court-yard be provided for the head teacher and also if possible bachelor quarters for one or more assistant teachers. The garden may vary from $\frac{1}{4}$ to $\frac{3}{4}$ of an acre in size.* In the case of a Rural school it would ordinarily be unnecessary to have any land attached to the school as the children would work on the land of their parents or on that of such parents as allowed it. But a small garden varying from $\frac{1}{4}$ to $\frac{3}{4}$ of an acre in size would be an advantage and no sub-plot should be less than $7 \times 3\frac{1}{2}$ sq. ft. in area.

Rural areas more than any other afford ample opportunities for taking advantage of this means in education. The aims and purposes of school gardening may be regarded from two distinct standpoints, *viz.*, the economic and the educational; and although it was from a purely utilitarian point of view that school gardens originated, the educational value is now mostly generally emphasised. The idea originated in Europe where the majority of school gardens still look to utility. On the other hand in America, there has been a tendency to

* Vide March number of *The Agricultural Journal of India* for the article on the subject by The Honourable Mr. S. M. Freemantle I.C.S., C.I.E., of the Board of Revenue, Allahabad and author of "A Policy of Rural Education in India" (0-3-0), 1916, with a Foreword by Lord Meston (The Pioneer Office, Allahabad).

make the movement too pedagogical and to emphasise the importance of educational aims to the exclusion of the economic. The Macdonald School Gardens of Canada which have proved to be some of the most successful in existence, were "designed to encourage the cultivation of the soil as an ideal life work and are intended to promote, above all things else, symmetrical education of the individual. *They do not aim at education to the exclusion of utility but they seek education through utility and utility through education. The garden is the means, the pupil is the end.*" The utilitarian aspect is kept well in view, though it is not the most important; the results on the children are of primary importance, the garden and its products are secondary. While this is as it should be, it is probable that the *utilitarian* view of the case will appeal forcibly to many who are interested in education in all public schools. It is truly difficult to overestimate the importance of this phase in a country where 67 per cent. of the population are agriculturists and the great majority of the pupils of the vernacular schools will return to their life work on the soil. Hence it is quite permissible to take this view and to emphasise the results which may accrue from the diffusion of agricultural knowledge. As already explained the *raison d'être* of school gardening in most of the countries of Europe was originally an economic one "to increase the productiveness of the land and to enhance the wealth of the State." It appears to have been successful, for in France where the school garden is one important part of the system of education, it is given credit for having doubled the resources of the country within a few years and no doubt it also had its cultural value. This of course is under the guidance of properly trained teachers. The real purpose of a well-conducted

school garden should be *to educate the children* and not merely to show them how they may produce vegetables and flowers. The very finest garden may be obtained and yet the garden may fail in what ought to be its chief object. Good crops are encouraging while failures are very discouraging but mistakes and failures in a school garden often prove to be of more educative value than success. It is possible to have a poor school garden but good school gardening.

The objects of school gardens are well summed up in Teachers' Leaflet No. 1 of 1909 issued by Mr. Direberg, Superintendent, School of Gardens, Ceylon. The following besides the more common ones may be mentioned.—

- (1) To furnish a field for Nature Study, *i.e.*, the study of natural objects in natural surroundings and to break down the prejudice for manual work and enhance its dignity.
- (2) To serve as object lessons in horticulture, *i.e.*, in the cultivation of useful and ornamental plants.
- (3) To give a practical turn to school life and provide a training in elementary agricultural science.
- (4) To serve as a form of healthful exercise inducing health and vigour of body and mind.
- (5) To serve as a means to the pupils of acquiring some knowledge of the soil, tillage, the conditions of plant life, the value of manures, seed selection, insect pests, etc., of using manual skill in the use of tools.
- (6) To be the medium of communication between the agencies that aim at the improvement of agriculture and the cultivating classes.
- (7) To induce the cultivators directly or through the school boys to take up new and improved products and adopt better methods of cultivation.
- (8) To awaken in school children a new interest in the cultivation of plants and instil into them a love of nature and so reconcile them to a country life of agriculture and peasantry.

(9) To give the sense of proprietorship in land, the beginning of ownership.

The starting point in the training of agriculture is Nature Study and no one can be a true agriculturist without first, being a student of nature. To an earnest student of nature agriculture and farm labour, instead of being a life of drudgery have more attractions than any other calling.

Under the guidance of the teacher, the child should observe the parts of a seed, the plant food in it, the process of germination and the conditions necessary for it. In each stage of the growth of the plant, he should pull up a specimen and observe the roots, their uses and structure; the flowers, their parts and uses and methods of fertilization; the fruits and seeds, their formation and uses, methods of dispersal and the like. He should observe the soil and its composition, the effect of plant food and manures. The garden should be deliberately used to give object lessons in failures as well as in successes in connection with soils, drainage, manures, weeds and the like. Simple experiments * *e.g.*, (1) showing practically the effect on plants, of different solutions, (2) how plants in the light give off oxygen, (3) how we can recognise our breath as $C.O_2$ and water vapour, and (4) the analysis of soils—should be carried on by good teachers.

After a course of observational nature lessons and

* Some experiments illustrating the economic value of scientific agricultural practice for concrete demonstration in all Agricultural Schools for the children at least of the Government Rural Pattardars, is highly desirable. Vide Green's *Rural Science* (Macmillan's First Books of Science).

Manual Training in the primary stage, the pupil in a Rural Middle School should be given simple lessons on seeds, rural economics and the legal relations between the landlord and the tenant and an efficient training in rural occupations allied to agriculture. The type of agricultural work to be undertaken at this stage is briefly this:—
 “In this school there should be given a good vernacular training combined with practical work in agriculture and subsidiary and supplementary industries (such as the extraction of oil from seeds, the preparing of sugar, work in jute, plantain fibre and leather, the making of matches, pencils and paper). Sufficient land should be in sight. Each plot should be cultivated by a group of youths who should derive a considerable income from it which should ordinarily be sufficient for their maintenance. This cultivation should be under the detailed supervision of a skilled agriculturist and should be done by improved but simple methods. In connection with each plot the necessary animals for cultivation and consumption of fodder should be provided and maintained so as to give practical training in the case of stock and their product and the use of the fertiliser. Instruction should at every point be closely allied with the doing of the thing.” Through such a course of Pre-vocational Education of the exploratory type, we have to set about testing the peculiar disabilities of pupils and hence we have to make the technical curriculum also as wide as possible like the literary curriculum by starting with half a dozen allied courses in the case of each boy while by the necessary eliminations, the boy gains only in one or two subjects by the time he completes the Higher Elementary stage such knowledge as would be sufficient to provide him with a decent means of livelihood.

17. Biology, i.e., Nature's Laws :—

The aim should be to make the child grasp some of the following great laws of Nature.—

Plants :

- I. *Plants in order to live, require sunshine (light and heat), air, soil, moisture.*
- II. *Animals are dependent upon plants.*
- III. *Animals in order to live require food, air exercise.*
- IV. *From a seed may grow a tree.*
- V. *The prime labours of the plant—food making and seed producing, are illustrated in the work of leaves and flowers, respectively.*

General :

- VI. *There is a proper season for everything.*

There is tendency for Nature Study lessons to become at the hands of bad teachers either object lessons of dead, isolated things, *e.g.*, metals, or elementary science lessons with elaborate classifications introduced into the lessons on life, such as that of animals. It would be quite sufficient if in the latter case the teachers confine themselves only to those birds and insects which would be helpful to the farmer or the gardener.

18. Museums :—

The work may be enlivened with excursions to study—

- (1) Local plants, insects, pond and shore life ;
- (2) Influence of climate, elevation and water-supply on plant life ;
- (3) Methods of nature for securing cross fertilisation and seed dispersal ;
- (4) Inter-relation of plants and insects ;
- (5) Classification of plants and insects ;

The pupils being induced to maintain Nature Diaries of observation and collect, with a view to preserve typical specimens, *e.g.*, bee-hives, mounted dried specimens of different kinds of leaves and plants, specimens of rocks and minerals and shells in the locality, specimens of seeds to illustrate seed dispersal and simple and multiple fruits, slices of wood, insect specimens and animal pets.

19. Earth knowledge (Geography, Geology and Physiography)—Excellent opportunities in Rural Schools :—

Then again the garden ought not to be regarded only as a centre from which new products may spread or as a training school for a few promising agriculturists. One might as well consider the school as a stationer's shop or confine the teaching of arithmetic to embryo clerks and book-keepers. An exact record of work must be regularly kept and in many cases it is well for the pupils to work in parts. Mere knowledge of how things ought to be done and what they ought to look like, if only they were found and seen, is of little value. A series of exercises should first be set for the class so that the inferences may be woven into a lesson the effectiveness of which may subsequently be tested by practical work either in the field or classroom. Each pupil must have an idea of what he is aiming at and proceed independently to the fulfilment of his object. The pupils must do things for themselves and in all work, drawing, measuring and weighing should be insisted on wherever circumstances permit. In those cases where there can be no gardens as in some town-school, a great deal of useful work can be done by growing plants in pots or boxes. A combination of school gardening and geography is probably

the best available way of teaching scientific method in the village schools, where very little money for teaching apparatus can be had and the mass of the people are agricultural. The school will thus be a real preparation for the higher education of life.

To give at least a correct sense of direction to children a knowledge of geography cor-related with the teaching of field surveying and modelling in relief is essential. At first, instruction should be about the physiographic aspect in a practical manner from which the pupils should be made to deduce the relationship between the facts. A number of most interesting lessons can be given on the sun, its course in the heavens, and its position at sunrise and sunset leading on to instruction on the varying length of day and night. The change in the length of the shadow cast by a vertical stick will help the pupils to discover for themselves that the sun is more nearly overhead at one time of the year than at another—an observation which will serve to introduce simple notions on the seasons. Records can be kept of rainy, cloudy and sunny days and of the relative number of hot and cold days and the pupils will thus be led to form their own ideas regarding the meaning of climate. Then inside the classroom, quite young children can, with the aid of simple apparatus be taught the shape of the earth, its two chief movements (on its axis and along its orbit) and the succession of day and night. It should be noted that in this part of the course, it is accurate observation and correct deduction which matter; scientific explanations may safely be left to a later stage. No schools are so fortunately situated for purposes of geographical teaching as Rural Schools. The teachers should give elementary ideas of physical features on lines more rational than those of the old method which required

the pupils to mechanically memorise definitions without having studied examples of the things defined. Advantage will, it need hardly be said, be taken of local features to impress geographical ideas. After a shower, the teacher will easily find in the road or play-ground examples in miniature of rivers, tributaries and watersheds, hills and valleys, islands and lakes, straits and isthmuses, and the ideas having once been grasped, they can be impressed by the aid of a sand or a clay-model and after sufficient concrete illustration by means of visual instruction through the picture and the map. Elementary ideas regarding casual relations of geographical facts with reference to a predominantly agricultural country like ours with occasional famines owing to the irregularity of the monsoons, should be established at an early state, *e.g.*, the effect of geographical position and physical features on the meteorological conditions of a place, the effect of climate and geographical position on the products and trade of a place, etc.

The following extract from "*Schools with a Message in India*" by Dr. D. J. Fleming of the Union Theological Seminary, New York, describing the methods of Nature Study Teaching adopted in the Boys' High School, Kalimpong, where special attention has been given to the work in view of the Himalayan environments amidst which the institution is set, may be of considerable interest to those who are closely following the educational efforts of the Scottish Universities Mission. Rev. W. S. Sutherland, D.D., whose name is familiar to all of us and who is regarded as one of the most genuine and sincere American friends of this country, was the Principal of the School for 41 years, till 1920.

"The pupils get fairly excited over the growth of a young bamboc

plant. For they plot a curve to show how much it grows on successive days—one half-inch, one inch, *two* inches, TEN inches, and then less and less for each twenty-four hours. They are made curious to find out how far the roots of a bamboo will spread in a year and by measurement find that they will travel as far as twelve feet.

In one classroom we found a Nature Calendar, with the first cosmos recorded at its proper date. In another, three cages hung from the ceiling. They had been made by the boys. Inside were the cocoons of the three atlas moths. Having fed the caterpillars, the class was keen to see the moths when they should come forth. Behind the school is a small pen, about which the boys gather to see a bristling porcupine. Several beetle-boxes are on the verandah. Himalayan butterflies are famed for their exquisite colouring and the school collection would make a professional envious.

The drawing lesson in another class revealed an unusual object for study. In front of each pair of boys, fixed to the front of their desk, was a Y-shaped piece of split bamboo with a few strands of web across, on which calmly sat a great big spider. One admired the teacher for knowing that twenty spiders could be induced to sit this way and be drawn. Each boy has secured his own specimen, according to the kind prescribed, and as they draw him they study him closely. They learn that spiders have stiff poison sacks under the control of a voluntary muscle, different from the snake's poison sack, which is soft and works automatically.

One day, as they were examining a specimen, the spider began to change its skin. They eagerly watched, and could see its back split down. Out came head and legs. At a previous time they had recorded concerning this same spider that in a fight it had lost a leg. When the spider came out, there was great excitement on finding that the lost leg had grown out again. While observing the spiders the boys feed them on locusts and grass-hoppers. These are no match for the spiders which clutch them by the back and soon all is over. But just after the spider has changed its skin, it is observed to be soft, and then it is not uncommon for the locust to win.

At a certain stage of the War there was great demand by one of the departments in India for a spider whose web was needed for the cross wires in instruments. They could not get them in Calcutta, the usual source, because it was at the beginning of the hot weather. This school supplied the deficiency.

At a little distance from the school building are two small cement platforms with a slender, perpendicular iron rod in the centre of each. These are shadow measures for getting the meridian of the place with the rod as centre, a series of circles have been marked on the cement. One boy is asked to note the spot at which the shadow of the upright central rod falls on the first circle in the morning and then again in the afternoon—in other words, the spots at which the shadows are the same length. From this the meridian can be determined. Other boys repeat the experiment as a check, using other circles. Each year a new rod is put up. The boys must mix the cement, lay the platform, and insert the rod quite perpendicularly. A still further, though less accurate, check is made at night by sighting on the north star with simple apparatus.

Near by is a Sundial. This too, is made anew each year by the highest class. There are also two Rain-gauges. The boys measure the diameter of the opening, calculate the area exposed, and from observations of the quantity of water collected, ascertain the rainfall. A record is made on a chart showing the curve of variations in rainfall throughout the school year. Another chart gives the variation in temperature. Still another is a boy-made contour of the eastern mountain range, on which from time to time the exact peak at which the sun rose had been noted. Above each of these charts were placed the charts of the previous year. From a comparison they could see that while rain and temperature vary from year to year, the sun, like a great pendulum, swings back and forth along the horizon, and yet rises at the same place on the same date throughout the years.

If one goes into the Primary Grade, we may find the children playing with seeds on the floor. From these seeds one lad had out-lined a goose; another a cock; a flag, a fish or a kite. If a class is lined a goose; another a cock; a flag, a fish or a kite. If a class is modelling an orange in clay, you may be sure that the first duty of the children was to procure the clay one-fourth of a mile away. It would be easy to send away for raffia material, but in stead of this artificial procedure, they adopt the vastly better plan of using local material. The children are taught to take aloe leaves to the pond, soak and beat them into fibre and then deftly weave them into long slender strings. If a visitor picks up a bit to test its strength, the youngster grins as he knows an aloe fibre is not to be thus broken. Some of the little fellows were making corn shuck mats for local use.

Certain life histories are always studied—those of the mosquito, house-fly, and frog. On some one life history a class may specialise as on the castor silk-worm. Similarly they study the germination of the common crops about them. In laboratory vessels, they see the process. At certain stages, such as the coming of the first leaf, the class will have special opportunities for observation, sometimes for half a minute, sometimes for half an hour. When the parents are planting rice, one of the classes are planting rice and studying how it grows. Such study of course, merges into agriculture, for the older boys in the training school, through germination, scientifically determine the percentage of live seed. This leads naturally to the selection of seed. They study the growth of turmeric and work with it until it is consumed in their curry. Arrowroot is cut with a knife made out of bamboo (and they know the reason why) washed, pounded and enjoyed at the table to such an extent that the culture is being introduced into their homes.

This Nature Study is cor-related, as far as possible with other subjects. When they have been watching a specimen of their staple crop germinate, they sketch the plant in the drawing period. If a net is needed in sericulture, the materials must be brought from the jungle. If the subject is beetles, or a moth that eats a certain kind of leaf, the boys must find them, draw them and write essays about them.

One would be acting absolutely contrary to the spirit of Kalimpong's Nature Study if one sets out to copy it. It is not a copy of anything. They did not set out to make corn-shuck mats or ale-fibre string. These things grew out of the materials present in the environment. The development of the present sericulture plant is typical. It all began by the study of silk moths found wild in the jungle. The Principal was leading the boys to see how, when the first mulberry trees begin to sprout, they will probably find one or two silk-worms beginning to come out. The wild moth which they had been using might be called the grand-parent of the real silk moth. So the Principal sent to a Government station for eggs of the regular mulberry silk-worm. When these were attacked by disease, specimens were sent away by advice. This happened a second year, when the inquiry came, 'What are you doing up there in the mountains?' They were asked to 'Come and see'. On coming, the

Government officers found just the kind of common-sense experimentation that they were eager should be done. It resulted for years after in their constituting this school as a sericulture research centre. The making of the nets used in sericulture became an obvious addition to the hand-work of the school. It has been found that even a single generation of the silk-worm is improved by living in the hills, and the surrounding farmers are beginning to plant out stretches of mulberry in order to busy themselves with silk during the interval between sowing and reaping. No more significant illustration could be given of how the much-longed-for subsidiary industries for the village life of India are to be developed.

The boys are constantly being encouraged to open their eyes, and to think about what they see. They may be sent to a certain spring to discover when it begins to flow after the winter months. The date is compared with that of the previous year. Why is it later this season? They find the solution in a comparison of the rainfall charts of the two years. Or the date for the first swallow in the nature calendar is compared with the entry of the previous year. Why earlier? A clue comes from a comparison of the two temperature charts. 'Why do you plant corn in April?' 'It is the season.' But why is it the season?' 'It is the time'. But is not there time in July, too?' 'Others do it' 'But why do they do it?' Finally they are led to see that the seeds need certain conditions, increasing warmth and moisture, and that April gives both these.

If you ask a common hill gardener why he digs about a plant with a common stick he will answer. 'All do it. It is the custom.' If again you ask, he may say, 'The plant needs it' or if you ask why a plant rots when too much water is habitually given it, you can get no further than, 'It is the way of the plant.' But ask these same questions to one of the Kalimpong boys, and you will get some such answer as this: 'There is a hard crust about the plant. If it remains, the air can't reach the roots, and roots need air. The plant will suffer as we would if we did not get enough air. If there is too much water, mud is formed, and air can't get through the mud.'

These mountain lads—just as we ourselves—are often blind to the commonest events about them; 'Have you ever seen the wild geese come down the Tista river the Principal will ask a class. 'No.' Then at the proper time the class is taken out to the edge of

the compound, looking away off between those wondrous snow-capped mountains, where they can see the flocks of wild geese coming down the great valley of the Tista river—and never can they forget or be blind to that sight again.

In studying life histories or working up to the principle of seed selection, or following turmeric until it disappears in curry, the Principal holds that they are not studying Zoology or Botany—not in the sense of beginning systematically with monocotyledons, and going right through a logical series—they are simply studying live things. *He is not aiming to impart definite agricultural information, not to make miniature model farmers. He is trying to train his pupils to be observers, thinkers and experimenters.*

Most of the people amongst whom his boys will live are illiterate. Books will be exceedingly few. But a great book lies about them—sun, moon, stars and winds. If they can learn to read this great book so full of changes, it will keep them fresh. He wants his little lads in the Third Standard to be able not only to hold a book, but 'to read a plant' and be literate in the sphere of Nature's open book.

The inspiration of this experiment lies not alone in its suggestion for Nature Study. In fact, Kalimpong's Nature Study is doubtless a little too finely drawn for the masses of India. But the same genius in teaching, the same independence from a dull routine, the same novelty in experimentation, the same alertness for practical applications, should be emulated in the solution of India's major problems in education.

20. Civic Administration and Citizenship Lessons:—

When the time comes for dealing with the administration of a district or province, the teacher should try to show through synthetic maps, how far political boundaries coincide with or diverge from physical boundaries, *i.e.*, introduction to the elements of Historical Geography.

Simple economics should be taught to every boy and girl even in such schools as these. Mr. L. H. Bailey, a well-known writer on Rural Economics and Life in the

United States, has paid much attention to the problem of the American Village School and the following remark in regard to the Rural School may be cited from his "Training of the Farmer."

"I would have the child know the pupil of the community and how they live; how the community supports itself, its relation to the neighbouring community; how many schools there are and how many churches and how they came to be there; the roads; the general lay of the land; and something about the soils; how many farms in the district and what they produce and why; the common or significant animals or plants; the woods and streams, how the locality is governed; how the houses are built, what the local factors are and so on. And I would teach him how to keep himself from being sick or lazy. I would not have all this told to the child as the news or pleasant pieces of information; I would have it constitute the real work and substance of the school." In this connection it is well to remember that every Higher Elementary School should give its pupils lessons on (1) the relation of consumption to production, (2) the administration of the farm income, (3) labour efficiency, (4) capital, (5) organisation and management of agricultural enterprise, (methods and problems), (6) transport and storage facilities, (7) principles of value and price, (8) land tenure and policy, (9) breeding, etc. History may be cor-related with the teaching of civics and a course in citizenship. As Sir M. Visvesvaraiya says "Elementary practical science as applied to agriculture, elementary book-keeping and rudiments of information concerning the economic structure of the world and of India in particular as well as instruction in the duties of citizenship, should form part of the primary school curriculum. Civics and

elementary economics should form subjects for instruction in schools of all grades and in every primary school a spirit of citizenship should be aroused among the pupils and the elements at least of civic government imparted to them." Every village boy should be taught the elements of democratic ideals, Representation, Local Self-Government, Village and Taluk Councils and Administration, Unions and Panchayats, and the qualities and duties required of every individual to successfully discharge the obligations he owes to the State.)

21. Space work, Arithmetic and Drawing :—

Of course, number work and arithmetic would be extremely essential provided it be quite rural in character, (useful for such things as calculating kist*) and cor-related with space work, the Indian idea of decimals (to be seen in the system of acreage) experimental geometry and mensuration involved in maistry's and karnam's work. Roughly the whole course prescribed for the S.S.L.C. in Elementary and Practical Mathematics may be gone through, even in a Lower Elementary school in a smaller compass on the concentric plan, in the vernacular.

Drawing may be brought to a useful account, if the conventional pattern—making and copying is abandoned and free-arm drawing cor-related with every subject be resorted to instead.

22. Knowledge of language and craving for the acquisition of English :—

There is a very general desire for the teaching of English in Elementary Schools. It is felt that even a

* "Arithmetic for Farmers" (Agricultural College, Poona).

smattering has some utilitarian value. This feeling is found even in rural tracts but is stronger and more articulate in urban areas. An English-knowing teacher generally gets more pupils for his school than one who has no such knowledge. In most Higher Elementary Schools English is taught for the sake of pupils with special gifts that he or she may go on to corresponding classes of secondary school without any waste of time but the teaching unless the teacher be a trained matriculate is generally bad, as the teacher's knowledge of language is small.

Of course, it is undesirable that it should form one of the subjects of instruction of a large bulk of children who more than a knowledge of English need a thorough mastery over their own vernacular.

The criteria adopted by the Inspecting Officers whether English may be taught or not, are the competence of the teacher and the need for the teaching of the language in the locality. It must be confessed that, even where it is forbidden there is illicit introduction of English out of school hours. As a result of the prohibition, numerous non-departmental Primary Schools, teaching English, are springing up everywhere realising such enormous fees as to make them disregard the motive for applying for aid, while the vernacular teachers themselves have not been able to realise the minimum. For that matter Sanskrit may be more desirable in vernacular schools but this expenditure of energy may be diverted usefully to the learning of the principles of agriculture, *e.g.* (1) Plant diseases by parasites and fungus growth, (2) Insecticides, (3) Composition, properties and classification of soils and their improvement by manures, (4) Agricultural machinery, (5) Cattle and milk, (6) Irrigation, (7)

Crop cutting, (8) Sericulture and gardening, (9) Kinds of crops, (10) Preservation of farm-yard manure, (11) Sterilisation of seed, (12) How to increase the paddy crop, (13) Rotation of crops, (14) Thremmatology.

What should really be aimed at with regard to language work generally is to create in the pupil a taste for chastened vernacular poetry through graduated lessons in elocution, and enable him to read intelligently, pure prose passages, to draft forms like mortgage bonds, deeds, petitions such as for waste lands, and relinquishing them, for change of registry and remission, documents with formal headings, and letters with proper forms of salutation *e.g.*, Shrees and Namaskarams for each relative or caste. For this, the teaching of letters can fairly be postponed until the boy grows to a fair age * and in the meanwhile he may be trained to cultivate a love for Nature through practical and observational instruction in the open and express clearly and properly ideas about it. Nature Study is the best substitute for the old cramming methods of study and corrective for the modern bookish methods.

* Robert Owen originally planned that books should be entirely excluded from the Infant school. His son (writing in 1823) says: "It has been deemed necessary, in order to meet the wishes of the parents to commence teaching the children the elements of reading at a very early age, but it is intended that this mode should ultimately be superseded, at least until the age of seven or eight by a regular course of Natural History, Geography, Ancient and Modern History, Chemistry, Astronomy, etc., on the principle that it is following the plan prescribed by Nature to give a child such particulars as he can easily be made to understand concerning the nature and properties of the different objects around him before we proceed to teach him the artificial signs which have been adopted to represent these objects."

Wordsworth's lines on the wealth of instruction which nature offers to its devotee who has eyes to see with, are well known.

I have learned

To look on nature, not as in the hour
Of thoughtless youth; but hearing often-times
The still sad music of humanity,
Nor harsh not grating, though of ample power
To chasten and subdue. And I have felt
A presence that disturbs me with the joy
Of elevated thoughts; a sense sublime
Of something far more deeply interfused,
Whose dwelling is the light of setting suns,
And the round ocean and the living air,
And the blue sky, and in the mind of man;
A motion and a spirit, that impels
All thinking things, all objects of thought,
And rolls through all things. Therefore am I still
A lover of the meadows and the woods,
And mountains; and of all that we behold
From this green earth; of all the mighty world
Of eye and ear,—both what they half create,
And what perceive, well pleased to recognise
In Nature and the language of the sense.
The anchor of my purest thoughts, the nurse,
The guide, the guardian of my heart, and soul
Of all my moral being."

Lines written above Tintern's Abbey.

23. Object in view in planning this course :—

All instruction should aim at making the village life interesting. "While however our rural education aims at equipping the pupil to hold his own in an age of slow revolution, it must not be supposed that it attempts to make of him anything save that for which is intended him. He may become more wide awake, more alive to

his own interests, more able to cope with those who try to dupe him. But so far as our efforts are concerned, he will remain an Indian ryot. It has been remarked that the civilisation of a pupil can be developed only along its original lines of genius. However much this saying may appear to be falsified in the case of Japan, it would be hard to deny it regarding the present condition of the conservative agricultural classes of India. To attempt to Europeanise would be madness—a scratching of the epidermis with a view to producing a metempsychosis. Moreover there are excellent points in the character of the native husbandman, in his ways of cultivation (rude as they seem to us) and in the institutions of his village community. Our rural schools would develop the merits and supply the defects of his nature: they would show him how to make the best of his environment, not to change it. Our course of instruction, moral, mental, and physical, is based upon indigenous ideas. These (or the best of them) are presented to the pupil in an organised form; and they are inculcated upon an accidental (that is a rational system of pedagogy).” *

24. The present condition of teachers : Suggestions for Improvement of schools :—

The teachers at present are, no doubt, conservative. True, some teachers are still to be found to introduce the boys to the letters of the alphabet through the alphabet sheet, though it has been forbidden by law in Germany. True, they rarely peruse the highly useful and informing

* Sharp's Occasional Report on Rural Schools in the Central Provinces.

leaflets of the Publicity Board and Agricultural (now Villagers') Calendars freely distributed to them. This is surely disheartening, but central classes if infused with a new life can be turned into an effective instrument by which the lethargy of the teachers can be shaken off. The following are a few more suggestions aiming at the improvement of the present system of rural education.—

- (1) The school times and seasons should be such as suit the convenience of the agriculturists. That is to say that the school hours and vacations should be liberal in length and should coincide with the principal harvest or harvests. On the other hand, the holiday given on account of religious festivals and feasts should be confined to those actually necessary in the circumstances of a particular school. As Mr. Freemantle believes, there appears to be no necessity in the Christian schools, any more than in mills and factories, to allow a Sunday holiday, when there is a sanctioned holiday before or after Sunday. He is also very enthusiastic about the half-time system. He says “Under this system boys from the highest to the lowest class attend school only once a day for two to three hours morning or evening. All are at home for the mid-day meal and before or after that, are available to assist their parents. They remain in touch with agricultural operations and in sympathy with their parents' work and interests. Collateral advantages of this system are that overcrowding in school is avoided and that fewer boys being present, the teacher can give them more individual attention. But it will be said that the half-time system has been tried and failed. It is true that the system has been tried and failed in rural India, in the

Central Provinces and also it is thought in the Punjab and it is not generally considered to have been successful but information is wanting as to whether the conditions under which the trial was made were such as to make success possible. Since the leading residents of the village want full time for their own children and care nothing for those in a lower stratum of life, and since teachers and inspecting officers alike join them in resisting any change by which education may reach a different class to that traditionally entitled to it, it is very difficult indeed to see that the half-time system gets a fair trial. In England the half-time educational system is still in force for boys of 12 and 13 who are only allowed to work half-time in mills and factories. One week they work in the mill in the morning and in the school in the afternoon and *vice versa* in the second week. The system is generally acceptable to parents who agree with Mrs. Perring's sentiments at the beginning of this chapter and want their children to start earning something as soon as possible, but it is condemned by almost all outsiders on the ground that it deprives the boy of his fair share of the education provided by the State. A new use for the half-time system has however been recently found in America known as the Fitchburg plan, which is said to be rapidly proving of benefit alike to the pupils, the schools and the employers. Under this system one set of boys or girls spends one week in the school and a following week at work, the second set being at work while the first set is at school and *vice versa*.

(2) The subordinate inspecting officers, agricultural officers and medical officers should act like peri-

patetic teachers, at least, of central classes, making it always a point to give lectures illustrated by microscope demonstrations, projecting lantern and stereoscope displays supplied to the offices, in the course of their visits, on useful topics pertaining to agriculture, sanitation and geography, corresponding to the kaleidoscope exhibitions of panoramic views, sometimes given by itinerant mendicants. The cinema plays a great part in the village education of the west.

- (3) All schools should be insisted upon maintaining statistical information as regards the population in the village; how many receive education; why the rest are hindered from doing so; and how best they may be induced to go to school; also a progress book (as is daily maintained in Secondary Schools), showing the progress made by each pupil in each subject by each class, similar to the form we are now adopting for the monthly returns of schools under public management.
- (4) In the case of schools which are not properly equipped with the most necessary requisites in spite of repeated suggestions the grant at the time of payment may take the shape of books, globes, geographical models and other appliances.
- (5) In connection with every school, a committee composed of a few respectable, progressive, liberal-minded and interested villagers should be formed whose duty it should be to visit the school once a week recording their proceedings to ensure: (a) that the school work is briskly and effectively going on; (b) that registers are not cooked; (c) that the school is being held every day punctually for the length of

time required and on the whole to popularise the school.

- (6) The formation of such responsible and representative school committees would not only create in the community an interest in the school but would afford a first and needed introduction to real local self-government. Under the new compulsory Education Act, a Council for each district consisting of officials and non-officials with official minority, has been formed to administer the school in its jurisdiction.
- (7) Model government village industries for demonstration purposes may be started.
- (8) Little children can be made to attend school regularly by means of nice little presents. From the Third Class onwards the boys may be exhorted to be regular, through illustrative teaching and a few by attendance prizes of papers, banians, shirts and coats. The children of the dhobies may be assigned weekly the task of getting clothes washed and ironed. Children should be taught the hygiene of cleanliness practically. After the school meeting is over, the teacher can meet the parents of the children who absent themselves and unless satisfied with the explanation, should induce the children by removing as far as possible the disability if it is reasonable, to attend the school.
- (9) Small demonstration farms under the control of the Agricultural Department might be started at places where Normal Schools and Training Classes are located. Mr. Sly says in *The Agricultural Journal of India* for April 1906 "The educationist in India is fully occupied with inspections and other departmental work, so that he cannot be expected to have minute

acquaintance with Indian systems of agriculture. The officers who should know most about the latter subject are the Director of Agriculture and his staff. For this reason I plead for closer co-operation between the Educational and Agricultural Departments. In most cases, it is impossible to secure a single officer who has a thorough experience of child education and of Indian agriculture. The best arrangement would, therefore, seem to be that officers of both departments should collaborate in the production of suitable lesson books. At any rate I suggest that a revised lesson book should in no case be introduced until the provincial Director of Agriculture has been consulted upon it. If the Director is not able to help with advice as to method on which the lessons are prepared he can at least secure that the agricultural facts are correctly stated in them. If any of the lessons deal with subjects (insect life) upon which he is not competent to advise he can refer the matter to the Imperial Department of Agriculture with its larger staff of specialists. The final decision must of course rest with the Educational Department. Again the resolution of the 11th March 1904, says: 'Steps are being taken to supply courses of training specially suited for teachers of Rural Schools. *These do not attempt the impossible task of reforming agricultural practice of the peasantry by the agency of the village schoolmasters imbued with a smattering of scientific theory. They serve the more limited and practical purpose of supplying the village school with the teachers whose stock in trade is not mere book learning and whose interests have been aroused in the study of rural things so that they may be able*

to connect their teaching with the objects which are familiar to the children in the country schools.' The evil in shortening and concentrating courses of agricultural instruction to teachers (*designed with a view to teach the students some elementary knowledge of improved methods of agriculture in the hope that they would become not only good schoolmasters but also useful members of the village community in introducing new ideas about agriculture to the children's parents*) has been that only a smattering of the agricultural science, quite insufficient to produce any real result is being imparted, and cramming is thus encouraged. *The chimera of attempting to introduce improved agricultural methods by the agency of the schoolmaster should be wholly abandoned and the training confined to the single purpose of producing school masters with a full knowledge of the methods of Nature Study.**

A candidate who is both a graduate of an Agricultural College and who also passed through a course of instruction in methods of teaching in a Training School is the only type of teacher that can give satisfactory results. It will thus be necessary either to select an agricultural graduate and put him through a course at a Training School or to select a good student from a Training College and send him to an Agricultural College. It exhibits a

* Mr. Orange, formerly Director-General of Education, also said that Farm Training in the Village School does not pretend to aim at reforming agricultural practice, but the present author however does not agree with this view and believes that Rural Schoolmasters should be so trained as to be able to influence the agriculture of the district through the education of the ryot, though it may not directly improve cultivation.

total misconception of the provincial school-farms if they are worked like agricultural experimental stations, comparative tests being made on fairly large plots of different kinds of manures. It is all right to plan an object lesson on the utility of manures, but this is very different from attempting to solve an agricultural problem of the comparative value of several kinds of manures. *A close co-operation between the Educational and Agricultural Departments in the management of Training Schools for Rural Schoolmasters is desirable.* The Agricultural Department should help in securing a really efficient instructor, should advise, as to the curriculum, should inspect the school-farm and should assist in the examination."

(10) Less efforts should be made to recruit schoolmasters from literary classes who have no touch with agricultural practice. By selecting the best of the cultivator's sons for training as masters, much more rapid progress will result.

(11) The efforts of the agricultural and weaving departments have to be greatly extended.

25. Conclusion a

"Do not think of salaries. The Government has reported to have recently told the teachers of a conference. "Do not conduct your conferences as though salaries were their sole or even their main object. Concentrate rather on the vast mental and spiritual factors of your work. Show in all, that you believe these to be things that really matter that you are capable of good and lofty constructive thinking upon questions of educational ideals and their attainment, of educational control, organisation and administration, as well as able to look

after the practical problems of your own immediate personal requirement and interests.

The whole secret of education depends on the teacher. We have to work through human instruments and no nation is well advised to allow its teaching profession to become discontented or unattractive, to talent and devotion. The teaching profession is a disinterested profession, and there must always be a missionary spirit in the profession. *I do not want it to be highly paid, but I want it to be adequately paid.** There is no calling

* We learn from The Indian Year Book, that under pre-war conditions

In New York.—

Lowest School teachers are paid a salary of	Rs. 190—375 a month.
Upper grade teachers are paid a salary of	... 455—565.
Principals of Elementary Schools	875 } Corresponding to our
Assistants	625 } Secondary Schools
High Schools	225—787½ } Corresponding to our Second Grade Colleges.

Training Schools	... 250—812½
Principals of High Schools and Training Schools	... 1,250
The District Superintendent gets	1,250 Against our Assistant Inspectors.
The Commissioner of Education	1,875 Against our Inspectors.

In Japan.—

The Minister of Education (a Cabinet Minister)	... 1,000
The salaries of the largest class of teachers are paid at	... 24—27 Against Rs. 8 in India
College Professors	... 75—500
The difference in economic conditions between one country and another is so much that the salary of a rural schoolmaster in America	

which makes such a constant and continuous demand upon high spirits as the calling of the teacher. A good teacher should flood a class room with his vitality." Gentlemen who wish to become patrons of learning by founding schools ought to know that there is on the whole more chance of their doing harm than good if the result of their "benevolence" is nothing more than a repetition of the old forms of instruction. They should also be made to understand that there is neither virtue nor merit in giving large sums of money for the promotion of education, if their scheme does not ensure

amounting to Rs. 100—200 is after all not tempting enough to attract efficient male workers. And yet in America the Professors are not paid more than what the Indian Educational Service people in India are paid. Even in England the case is not different. From a perusal of the Whittaker's Almanack, I find that—

PER ANNUM.

	£
The eminent Zoologist, Professor J. Arthur Thomson was paid at Aberdeen	... 700
The eminent Economist, Professor J. Shield Nicholson, Edinburgh	... 800
The Mathematician, Professor George Chrystal	... 1,270
„ Literary Critic Professor George Saintsbury	... 900
„ Geologist, Professor James Geikie	... 800
„ Psychologist, Professor Stout, St. Andrews	... 600
„ Biologist, Professor Patrick Geddes (now Professor of Sociology, Bombay University) St. Andrews	... 279

While in other countries, the salaries of workers in the lower grades do not fall much short of those in the higher grades, the difference in this country is enormous. There is no reason however, why in India too, the elementary schoolmaster should not be trained in the teacher's capacity in agricultural and systematic technical work and encouraged with attractive salaries. If teacher's are paid low for making education cheap, it would not be worth having when the effort is wholly misdirected.

adequate remuneration. So far as the teachers of Elementary Schools are concerned, it is gratifying to note that the State has not lagged behind in taking up the subject of the amelioration of their condition, so that it is only teachers that have now to approximate to their ideal.

APPENDIX I

The Madras Scheme is thus described by Sir A. Bourne: "Strictly speaking, this scheme makes no subject compulsory, but the following subjects are recommended as desirable for all schools—the vernacular, space and number work, general knowledge, drawing,* recitation with appropriate ragams, i.e., singing, and physical exercise. Instruction may also be given in any of the following—English, Geography, Civics and Indian History, Nature Study and Elementary Science, Hindustani or any South Indian Vernacular in addition to the pupils' mother tongue.

The names of the subjects intended for all schools are self explanatory except perhaps general knowledge. This comprised the simpler parts of nature study, geography and civics as these are understood in elementary schools and simple and important rules of health and conduct. In particular, pupils should be able to point out on the village survey map any particular field and its boundaries, to calculate kist, to know what a patta means, to know how to durkhast (apply) for waste lands, how to relinquish land, how to apply for change of registry and how to apply for remission.

The knowledge sought to be imparted is that likely to be useful in after life and is of a kind that clearly unites the pupil's school with his home life.

The Inspecting officers have been warned not to force the pace. It is no part of their duty to make teachers do what they are obviously unfit for. For the most part the older men have to be allowed to go on in their old ways, only conforming to the scheme so far as they are able to understand it.

* The scheme includes drawing not so much as an end in itself but because it is a means of expression and is also a valuable mental, and physical discipline.

APPENDIX II

PROFITABLE INDUSTRIAL EDUCATION IN THE MADRAS PRESIDENCY.

By W. FYFE, *Inspector of Industrial Schools, Madras.*

1. PRELIMINARY TRAINING.

It is now generally accepted that if the industrial possibilities of the country are to be developed as they ought to be, much more attention and much more money must be devoted to the spread of industrial education. The man who should be consulted, the man who alone is competent to judge the success or otherwise of schemes of industrial education, is the man who has to use product the employer of skilled and unskilled labor.

Before we set out then to train labor, i.e., to produce skilled men of all the grades necessary to develop the industries of the country, we must first try to ascertain what the employers require and then how best to satisfy these requirements. They want first and foremost a better educated, more intelligent type of artisan.

To start then with the employers' first requirements—a better type of artisan, how is he to be produced? If we examine the shortcomings of the present type of artisan in order, we discover, *firstly* that he is almost invariably nearly if not quite illiterate, and, *secondly*, that he has served no proper apprenticeship, and it has been nobody's business to teach him anything. He started as a coolie boy in the shop and picked up what knowledge he has, in a haphazard sort of way. As a general rule he is an expert operator of one machine on one operation, but as an all round fitter or turner, he is not particularly efficient. His lack of general education makes it difficult, if not altogether impossible, to convey orders to him in writing or by drawings, and he has a very hazy idea of the value of time. He is inclined to regard his own time as the only factor in the cost of a job and cannot be brought to understand that his machine has a value too, and that if he stays away from work on feast-days and Mondays, his machine standing idle represents a considerable loss to his employer.

What can be done to make this artisan more efficient as a producer? That is our first problem. The obvious thing would appear to be to start industrial classes for his benefit, but you can not go far with an industrial training unless you, first of all, provide

the foundation of a reasonably good general education. If a boy has not had a general education before entering a workshop, no amount of industrial training can make good the defect. It is generously recognised that the engineer, foreman and charginan must be educated, but it is equally necessary that the artisan also should be educated, though perhaps not necessarily in the same degree.

What then are we to lay down as the minimum general education necessary for an ordinary daily paid artisan; how far must he be educated before he begins to work in a mill or workshop as an apprentice or learner? Opinions on this subject naturally vary, but for the present I think we may accept the general principle that a boy should be able to read and write in his own language and be capable of doing simple arithmetic up to multiplication and long division. Some employers, principally those employing European foremen, maintain that he should have a colloquial knowledge of English, but all do not insist on that point, and as a starting place I think we may agree that for nearly every trade a boy should have completed the primary school course in an elementary school.

It does not necessarily follow, however, that the same curriculum should be followed in each of these schools. With a common foundation composed of the Three R's and the remainder of the time table drawn up with regard to the industries practised in the locality immediately surrounding the school, a reasonably well-prepared type should be available from which most trades can recruit their young operators and mill-hands. That is to say, a boy if kept at a well organised elementary school until 12 years of age or over, should have sufficient general education to enable him to become an intelligent artisan for most trades. But a lad should not be put to any of the operations comprised in a heavy trade like Mechanical Engineering until he is at least fifteen years of age and therefore sufficiently strong to stand the strain of such work. Moreover, for a highly skilled trade like Mechanical or Electrical Engineering, Pumping, or Cabinet-making a lad should have a little more general education than is comprised in the elementary school curriculum. His study of the Three R's should have as a general rule been carried up to the middle or lower secondary school standard but with a considerable portion of his time (a minimum 6 hours per week) devoted to some form of manual training and drawing, both freehand and mechanical.

Before completing such a course, a lad should be able to work simple equations, plot a single graph, calculate simple areas and volumes, understand the difference between simple plans, elevations and sections, and be able to use his hands in connection with his eye and brain in completing a simple piece of work in wood, metal, or any other suitable medium, from a properly prepared working drawing.

To sum up, the recruits for most trades should have a general education up to the primary school standard, the Three R's being regarded as compulsory subjects in all schools, the other subjects being optional and varying with the needs of the locality; while the recruits for specially skilled trades should have a general education up to at least the Middle School or Lower Secondary Standard. Their curriculum for the last 3 years should comprise 4 to 6 hours per week devoted to handwork and drawing, while the exercises in arithmetic and elementary mathematics should be based on practical and not abstract problems.

II. INDUSTRIAL CLASSES.

It may be well to review at this stage what is already being done in the way of industrial education in this Presidency. With the exception of the Leather Trades Institute, the Madras Trades School and Madura Industrial Institute, industrial education is limited to that provided in assisted schools. These assisted schools are mostly Christian mission concerns. A few are Muhammadan or Hindu, but the principle underlying their foundation is the same. They have been started as charitable institutions to help the individual, and not with any broad idea of developing the resources of the country. Some, nearly all, in fact, have been started as a means of providing destitute children with a means of livelihood. The missionary or the charitable Indian, wishing to do something to relieve the distress of poor, destitute, or orphan children, opened orphanages or schools for them and later added workshops of different kinds where the boys or girls could work at some trade or occupation until sufficiently expert to earn sufficient for their maintenance.

The practical training provided in these institutions was until recently of a very haphazard nature. In carpentry and weaving in particular, low paid maistries were employed as teachers and the

boys got exactly the same training in these school workshops as the bazaar carpenter's son or the village weaver's son received from his father. The product was seldom better than the bazaar product and very often much worse. The Missionary or Indian Superintendent was satisfied if the lad could earn his living. As charitable institutions, these establishments did very good work, but in multiplying the number of inefficient artisans and in many cases spoiling potentially good agriculturists to make poor carpenters or weavers, they were not advancing the development of industry to any appreciable extent, and were in fact as little deserving of Grant-in-Aid from industrial department funds as the village carpenter or weaver teaching his sons and nephews in exactly the same if not more practical methods. Within recent years the managing bodies of these industrial schools have been brought to realise that to entitle them to claim Government Grant-in-Aid for such institutions, a more intelligent and more efficient workman than the ordinary bazaar product must be turned out. A foundation of general education varying slightly with the circumstances of the case is not insisted on, the course of training is pre-arranged and comprises a reasonable amount of elementary theory of the principles underlying the different operations performed, and a fair amount of drawing, freehand or mechanical, according to the necessities of the trade.

Working under such improved conditions, the schools are producing a type of artisan who is superior to the bazaar product because he can generally understand simple drawings or patterns, can follow instructions in writing and generally can take a broader and more intelligent interest in his work. The schools are, moreover, turning out a type of workman distinct from the old time village caste-workman. The majority are Indian Christians of Panchama descent, a few are Panchamas, a few are non-Brahmana Hindus, a fair proportion are Mussalmans, and a very few are Brahmanas who are trying a new line away from the traditional literary pursuits of their caste. The majority of these industrial school ex-pupils cannot settle down in competition with the local asary workmen, but they find ready employment in Railway workshops, mills and other organised industrial establishments, where their previous training in discipline and good time-keeping makes them more popular with the employers than the caste workman, who is conservative in his methods, wasteful of time and energy and continually away from

work for the performance and enjoyment of domestic or religious duties and pleasures.

As long, then, as the management of these institutions are willing to develop their institutions on the lines of turning out a more efficient artisan than is turned out in the bazaar or commercial workshop, so long will they be entitled to Grants-in-Aid, but immediately their product falls below the standard reached by the training provided by working in an ordinary commercial establishment, the schools are no longer schools but simply ordinary workshops with no more claim to Grants-in-Aid than other commercial establishments conducted by private individuals for their personal gain. With reorganisation and better staff, these industrial schools even with the extra boys enrolled under the provisions of the Children's Act will remain to a considerable extent charitable or welfare institutions rather than aids to the development of industry. A few of them will undoubtedly be considerably improved in the near future and may turn out men sufficiently well educated and with sufficiently good practical training to enable them to take charge of other workmen, but as a means of improving the efficiency of the average artisan in the works and mills of the country, their influence is not likely to be considerable.

At this stage, I do not propose to take up the question of cottage industries like lace work and embroidery. There are many schools teaching these subjects, but their problems are different from those involved in dealing with organised industries requiring workshop conditions. Cottage industries deserve a paper to themselves. In the meantime, I wish to confine our attention to devising some means of immediately improving the productive value of the large number of apprentices and learners working in mills and workshops all over the Presidency. In time no doubt, we will get free and compulsory education, up to the age of 12 or a primary school pass, in this Presidency. When that time comes, we will have a better type of recruit to work on, but the time is not yet, and we must devise some means now for dealing with the boy and girl workers after they start work. Whatever we adopt can be improved and reorganised to deal with the better educated type of recruit when his or her time comes. *In the meantime, we have to deal with boys and girls of any age from nine years upwards, and the problem is no light one.*

The Carnatic and Buckingham Mills, Madras, have schools for their young workers, but smaller firms cannot see their way to such expenditure and many employers are inclined to say "Why should I spend money to improve workmen for the benefit of my competitors? The money I spend on education, they can spend on slightly increased wages and tempt away my workmen after I have had the expense of training them." I have considerable sympathy with the employer in this attitude. It is not fair to expect a few public-spirited employers to bear the burden for all the others and it is only fair, I think, that Government should encourage employers who are willing to experiment with schemes of educational welfare for their young workers. One firm in Madras has recently taken the matter up with very promising results. Messrs. P. Orr and Sons faced with the necessity of training larger numbers of young workmen in shorter time, have, with Government help, started classes in the Three R's and in practical work for a selected number of their young workers. The classes meet on two evenings a week and on Saturday afternoons, and the results so far show that the training of these boys can be, and is being, considerably speeded up.

Where possible, of course, such "work classes" should be held in working hours and not after hours, as a lad who has worked all day is admittedly not in a fit condition to study, but in this case neither the staff nor the machinery could be spared during working hours for tutorial purposes, and the experiment is therefore at present being carried on after hours, and also after the boys attending, have been provided with a meal at the firm's expense to compensate as far as possible for the extra fatigue. Government are helping the experiment to the extent of half the cost involved, and the department is watching the experiment very keenly to note possible developments.

For the present then, I consider that most good can be done by developing the "Works School" idea. That is to say, whilst improving and developing the existing type of charitable or orphanage industrial schools as incidental reservoirs of skilled labor, we should, wherever possible, assist employers to start classes for the young people employed in their works. The whole of the tuition should, if possible, be given in working hours, and where that is not possible *the Three R's at least should be taught in working hours and the practical work only out of hours.* If such classes are properly conducted, the management are entitled to apply for Government recognition

and Grants-in-Aid, and provided the classes are conducted in working hours, the apprentices attending, if they satisfy the other conditions laid down in Madras Government Order No. 1481, Revenue (Special), Department, dated 12th August 1920, will be eligible for industrial scholarships together with a bonus if they complete their full course. This Government Order provides for the extension of the present industrial school scholarship system so as to include young persons working in commercial works and mills, and represents an effort to assist employers to keep their apprentices and learners long enough to complete their training, provided the employer on his part is prepared to share in the effort by providing work-schools or classes for the apprentices and learners under training.

III. GENERAL MECHANICS.

There is yet another type of artisan much in demand all over the Presidency whose training is not quite provided for by an apprenticeship in existing workshops as at present organised. I refer to the general mechanic necessary to look after small power plants which are very numerous in this country. These small plants are mostly rice mills, ginning mills, oil presses, etc. Most of them are badly organised and run on very wasteful methods. They have been erected generally by indifferently trained mechanics, the machinery is, as a rule, badly arranged and scarcely any attempt is made to maintain it in reasonably efficient conditions. The engine-driver-cum-fitter-cum-carpenter type of mechanic in charge of the machinery is generally an illiterate workman who has simply worked as assistant to a similar engine-driver in a similar mill until able to convince some employer that he knew enough to look after running machinery. Such men are, of course, quite unfit to be left in charge of running machinery and many mill-owners are now convinced, in some cases after bad breakdowns, that it pays to employ a better trained man if he can get, even if he costs much more in the way of salary.

The trouble is, however, that the type of man required is hard to find. A trained fitter or turner or smith or moulder even if an expert workman well worth a good salary in an organised engineering workshop is quite unsuitable. What is required is an all-round mechanic who can turn his hand intelligently to almost any branch

of a mechanic's work not necessarily with the speed of an expert in that line, but with sufficient intelligence to do running repairs and keep his mill going. *He must, however, have some training in the elementary principles underlying different types of prime movers and be able to keep one or more particular types in good order. He must have some idea of the elementary principles of power running transmission and have had some training in adjusting, working, disassembling or assembling rice mill and other local industrial machinery.* The demand for such men is very great if not actually acute, and in the absence of other provision for training such men, it is proposed to try what can be done in Government institutions and in a few of the better organised assisted schools.

A start is being made by reorganising the school section of the Madura Industrial Institute to turn out the type of men required, whilst proposals are now being formulated to do something of the same nature by providing special training for a few selected boys in S. Joseph's Industrial School, Trichinopoly. These two institutions will cater for the southern districts, and for the northern part of the Presidency, proposals are now being worked out for the establishment of a Government school-cum-mill at Bezwada.

The foregoing pages show what is at present being done in the matter of industrial education in this Presidency and indicate my ideas what may be done in future:

(a) More care in selecting recruits and more provision for elementary education.

(b) More provision for manual training and other forms of practical education in the middle or lower secondary schools.

(c) Provision of preparatory trade schools in large industrial centres.

(d) Provision of works schools of all grades from very elementary general education to advanced engineering classes, the classes being held in the works and in working hours: or by the provision of central trades schools to provide the same facilities when groups of works are sufficiently close together to make such a system possible.

(e) Developing and improving existing assisted industrial schools and Government institutions with a view to turning out all-round mechanics for small power plants, and better trained cottage workers.

Items (a) and (b) come under the scope of the Department of Public Instruction, and a beginning will be made with item (c) by attaching a preparatory day school for prospective apprentices to the Madras Trades School, when it is finally housed in its new buildings with its permanent staff.

Item (d) is already fairly well provided for in Madras City by the Government of Madras Trades School (See Appendix VIII) which caters as a central school of continuation classes for apprentices and young workmen employed in the workshops of the city with a branch at Perambur for the Railway Works apprentices, and by the establishment as an experimental measure of Messrs. Orr's "Works School." When the S.I.R. Workshops are transferred to Trichinopoly, it is hoped that arrangements will be made to open a school in Trichinopoly on the lines of the Madras Trades School,* and when the Harbour scheme develops at Vizagapatam and that port increases in importance, similar proposals will be formulated for the establishment of a school or institute on the land which is being reserved, for such a purpose.

Item (e) is already being tackled in the Madura Industrial Institute and in the assisted schools, and the Bezwada scheme when it materializes, will complete that part of our programme for the time being.

IV. ACTION BY LOCAL BODIES.

The question yet to be dealt with is, "What can District Municipalities and Local Bodies do towards industrial education?" Local bodies wish to do something and almost invariably their inclination is to start an industrial school. From the enquiries which come in to my office, it is clear that few Chairmen or Councillors realise the trouble and expense of conducting such schools. Some

* A similar institution for the Bombay Presidency is the R.C. Technical Institute, Kalapur, Ahmedabad, which is under the control of the Government. Instruction for 3 years is given in vernacular in each of the courses in Cotton Spinning, Cotton Weaving and Mechanical Engineering. Applicants with a knowledge of English are, of course, preferred. A Boarding House is attached to the Institute and the term fee is only Rs. 10 though tools and instruments are supplied free and deserving students are given free scholarships.

of the Christian missions have dropped large sums in trying to conduct such schools, and the only ones that are really successful are those in which a missionary and in some cases two European missionaries give up their whole time and effort to the work. For example, the schools at Tindivanam and Kumbakonam have in one case two and in the other, three Europeans as whole-time teachers whilst several of the others have one trained European employed whole time in the work and many of the lace and needle work schools have two or more European lady missionaries employed on full time. The schools are successful only because they are well staffed at a very moderate cost for salaries. None of these schools could afford to employ teachers so well qualified if they had to pay ordinary market rates for their services. Apart from the European staff of these schools, the teaching staff is as a rule indifferent and fit only for employment under skilled supervision.

For these reasons I strongly advise local bodies to pause and consider before proposing the opening of industrial schools. A training section for teachers has been opened at St. Joseph's Industrial School of Cabinet-making, Tindivanam, and the supply of trained Cabinet-making teachers may be expected to improve rapidly, but the question of suitable Superintendents is very difficult. A local body must be prepared to pay market rates and a really efficient Superintendent cannot be got for much under Rs. 500. A Superintendent who is not efficient is worse than none at all. When the Government institutions are more fully developed, it may be possible to recruit from amongst the junior members of their staffs after some training and experience in posts as assistant superintendents, etc., men suitable for superintendent's posts, but until then I think that local bodies could do well to consider whether their object cannot be attained, perhaps at less cost, by other methods than by rushing into expensive schemes for establishing industrial schools. When such questions crop up, I suggest that the first point to settle is what particular trades or occupations in the locality require skilled recruits for their better development, and how many skilled or technically trained recruits are likely to find ready employment locally, in their trades. A town may, for example, have a few tan yards, a few dye sheds for a large number of weavers, whilst in most towns a fair number of wood workers and metal workers find employment. For the Council

of such a town to conduct an industrial school to teach all these subjects would be a serious undertaking, involving considerable expense to the ratepayers. Further, subjects like tanning and dyeing involve training in chemistry and the provision of an expensive equipment. Most towns, moreover, could not readily find suitable employment for more than one or two technically trained tanners or dyers per annum and a school conducted to turn out such small numbers would cost far too much per pupil.

I suggest then, that in such cases it is far more practicable for a local body to grant scholarships from local funds to a few well-selected young men for study in institutes or schools already organised and on a firm footing. For example, scholarships of Rs. 40 per mensem for three years might be given, tenable in the Government Leather Trades Institute, Madras, for the study of tanning, or in the Victoria Jubilee Technical Institute, Bombay, for the study of Cotton Weaving or Dyeing, whilst small scholarships of about Rs. 15 per mensem if granted to a few particularly suitable boys of good general education up to Middle School grade, would be sufficient with their apprentices' pay, to maintain them during a 5½ years Mechanics or Wood-workers' apprenticeship in the Government Industrial Institute, Madura.

The most efficient method for local bodies to adopt in dealing with the development of industry is not, however, to start with industrial schools or even with scholarships, but to start at the foundation of the whole structure by endeavouring to provide more facilities for primary and lower secondary school education and by endeavouring to keep that education on as practical lines as possible. If more of the children of the working classes are given an Elementary or Lower Secondary school education, with the optional subjects chosen and taught with some *practical* bearing on the local industry, and if the existing young workers are given facilities for instruction in continuation classes or work schools, preferably in working hours, but failing that, in the evenings, a more lasting improvement is more likely to accrue than can be obtained by tinkering with the type of youth who wants a supervisor's or foreman's post without the drudgery of "learning by doing."

Extracts from *The Journal of Indian Industries and Labor*, Vol. I, No. 1.

APPENDIX III

VERNACULAR AGRICULTURAL EDUCATION

(AGRICULTURAL JOURNAL OF INDIA)

The following is taken from a notice in "The Agricultural and Co-operative Gazette," Nagpur, June 1919, by Mr. J. H. Ritchie, Deputy Director of Agriculture, Northern Circle, Central Provinces:—

It is notified for general information that an Agricultural School for the sons of malguzars and well-to-do tenants will be opened on the Powarkheda Farm near Hoshangabad *on the 1st June, 1919. The course, the syllabus of which is given below, will be for two years and will be half practical and half theoretical. Boys must first have passed the Upper Primary Class before joining.

Buildings have been constructed and a hostel for 32 boys will accommodate the students. On the farm, there is a Sarai, and fathers of boys can put up there if they wish to see what their sons are doing. The department will probably manage to hold demonstrations to popularize the principal improvements if a sufficient number of parents assemble at the same time. It is proposed to allow 25 boys to enter the first year, and, as far as possible, this number will be allotted equally amongst the five districts of the Nerbudda Division.

No fees are being charged except a hostel fee of Rs. 2.8 a month to cover incidental expenses, e.g., servants, lighting, etc. The boys can make their own arrangements for cooking, but it would probably be preferable if they were to form a mess and have a cook who is being provided with all the necessary utensils.

Two teachers from the Education Department have been entertained after having received a training in agriculture at the Agricultural College in Nagpur. The Superintendent of the Farm will also closely supervise their practical studies to ensure that the boys are being taught correctly.

* Similar institutions have been opened at Chinsurah and Dacca for Bengal. There is already an Inspector of Agricultural Schools in the Bombay Presidency just as there is an Inspector of Industrial Schools in this Presidency.

The syllabus of study is given below:—

1. *Reading*.—From special Agriculture Text-books being prepared.
2. *Writing*.
3. *Arithmetic*.—The best upper primary text-book to be used in conjunction with the text-book used at the Loni Agricultural School, Bombay Presidency. This subject will be taught with special reference to agricultural subjects.
4. *Geography*.—The best upper primary book to be used. Local geography and general physical geography.

First Year

- (1) Propagation of plants by means of seeds, cuttings, budding and layering. .
- (2) Seed.—
 - (a) Plants and their use.
 - (b) Germination and its requirements.
 - (c) Germination percentage.
 - (d) Importance of good seed.
- (3) Necessity of soils for plant life.
- (4) Formation of soil in general.
- (5) Roots.—
 - (a) Growth.
 - (b) Effect of light.
 - (c) Use to plants.
 - (d) Kinds.
- (6) Leaves.—
 - (a) Different forms.
 - (b) Use to plants and their work.
- (7) Insect life.—
 - (a) Stages of life.
 - (b) Use of colour to insects.
 - (c) Their modes of feeding
 - (d) Classification according to mouth parts. .
 - (e) Rearing of insects to study the different stages.
 - (f) Information about crop pests in general and methods of destruction.
 - (g) Insecticides and use of sprayers.

Second Year.

- (1) Insects on stored grain and cattle and how to destroy them.
- (2) Plant life continued.—

- (1) Flowers.—

- (a) Parts and use.

- (b) Use to plant in seed formation.

- (2) Dispersion of seed.
- (3) Struggle for existence.
- (4) Life-history of some plants.
- (5) General information about fungus life and some common diseases with controlling measures.
- (6) Parasitic plants.

The Nature Study will be mostly or generally practical to develop observation.

5. Village life—

- (1) Simple lessons on village sanitation.
- (2) Principles of marketing.
- (3) Advantages of co-operation.
- (4) Rural credit.
- (5) Village, Taluk and District Administration.
- (6) System of land revenue in force.
- (7) Malguzari rights.
- (8) Reading and understanding of Patwari maps.

6. Principles of Agriculture—

- (1) Classification of soils.
- (2) Constituents of soils and their properties.
- (3) Physical properties of soils.
- (4) Soil improvement.
- (5) Irrigation.
- (6) Manures.
- (7) Crops.
- (8) Vegetable growing.
- (9) Animal husbandry.
- (10) Milk.

7. *Practical Farm work.*—Each boy will be allotted $\frac{1}{2}$ acre of land for growing staple crops on the group system and a plot for vegetable and fruit growing on the individual system.

8. *Elementary Carpentry and Smithing.*

9. *Fruit and Flower gardening.*

10. *Elementary Land-surveying and Crop cutting experiments.*

From the above syllabus it will be seen that a fairly comprehensive study of agricultural practice is intended. There will be very little really scientific study, as most of the time will be devoted to the study of Nature out of doors to help and develop the observation faculties of the boys and to stimulate their interest by making careful records of what they have seen.

The department cannot offer any post to students who pass through this course, as it is intended that such boys should return to their father's land to improve his cultivation.

APPENDIX IV

Manual and Industrial Training

LECTURE IN THE PUBLICITY BUREAU BY MR. W. FYFE,
INSPECTOR OF INDUSTRIAL SCHOOLS, MADRAS.

I. MANUAL TRAINING.

The term "MANUAL TRAINING" originated in Britain. Previous to the great industrial development, Britain was a country of villages each one more or less self-contained as Indian villages are to-day. Most industries were cottage industries and the children assisted in the work of the elders as Indian children assist in the operations of weaving and some other industries at the present time. When general education became popular these children attended school but continued out of school hours to assist in the home industry, doing practical things in a practical way and thus keeping their education fairly well balanced between the theoretical and practical.

With the advent of the steam engine, however, a vast change took shape in the life of the nations of Europe. The steam engine brought about the grouping of workman in large factories. The village cottage worker deserted his cottage work to earn day wages in the factory, and the grouping of factories and improvement in transport by the laying down of railways soon resulted in the

formation of the present large cities. The workman now spent an increasing proportion of his wages in buying ready made articles in place of the articles he and his family formerly made by hand for domestic use. The younger children were no longer taught to spin and weave and do the hundred and one little jobs about the house. Candles were no longer laboriously made by hand and stored against the winter. Willows were no longer collected by the children and woven into baskets. No longer did the travelling harness-maker and the wandering tailor come along and stay at the farm for a few days or a few weeks and make and mend harness and clothing for a few shillings and his food. Candles, baskets, harness and clothing were no longer made at home. These and many other articles could now be bought cheaply because they were machine made, and moreover the conditions of life in the large cities with the working classes crowded into tenements were such as to prevent the continuance of such home manufactures. The result of all this was that the greater part of the practical work of the juveniles was given up. More time was certainly devoted to study, but that study was entirely bookish in character, and it was not long before thinking educationalists saw the danger of that form of education turning out men and women "all head and no hands".

It soon became an accepted fact that this lop-sided type of education was not providing that "preparation for a complete living" which education should provide, and after many experiments, experiments I fear conducted largely at the expense of the children, the modern subject "MANUAL TRAINING" found its rightful place in the school curriculum as a means of training the child to use his head, and eyes, hands together in co-operation, towards the attainment of a common object. As is the case with every thing now in education, all sorts of people not connected with education exhibited an interest in this new system. Many weird and some extremely extravagant ideas were propounded; but the result of it all is that in most schools in Britain and Europe to-day, the children receive some form of practical hand-work as part of their general education. This hand-work or Manual Training is *not* intended to train the child for a definite trade or occupation but merely to accustom him to deal with concrete rather than abstract problems, to train him to use his hand and eyes and head in a logical, practical way, to train him to think straight so that he may work straight, and to apply his book

knowledge to the practical difficulties of everyday life in whatever walk of life he may pursue after he leaves the school-room. In its early days Manual Training consisted mostly of woodwork for the senior boys and domestic economy for the senior girls. Later some schools added simple metal work for the higher boys' classes, and later still the subject was introduced throughout the school commencing with kindergarten work for the juniors, clay modelling, cardboard modelling and similar work for the lower classes, and woodwork and metal work for upper standard, whilst drawing, both free-hand and mechanical, soon became recognized as a very valuable form of Manual Training either by itself, or correlated with the other various forms just mentioned.

Before leaving the subject however, may I just emphasize the point that MANUAL TRAINING as a part of a general all round well-balanced education, is necessary for the prospective surgeon or vakil as for the artisan, that it does not and never was intended to turn out trained workman but is merely intended to counteract the extreme bookishness of modern education and produce a well balanced sound mind in a sound body?

II. INDUSTRIAL TRAINING.

INDUSTRIAL TRAINING on the other hand aims at turning out a specialist, a carpenter, mechanic or smith or some other type of workmen trained in a particular trade or industry. Industrial education must rest on a foundation of general education and the first step towards securing the easy and economical spread of industrial education in this country is for local bodies to see that as many as possible of the children of the country receive the foundation of a general education up to at least the primary school standard.

Having laid down our foundation of general education, seeing of course that it is well balanced with Manual Training, we may proceed to provide industrial education in various ways. The method which I prefer as being most efficient, most practical and most economical is to apprentice the pupils in a commercial workshop or place of business, but also provide classes for their benefit in working hours in subjects likely to improve their value as producers. If possible the classes should be treated as attendance at work. The classes may be held within the premises of a factory. Where mills and workshops are sufficiently close together a central

school may be more economical. In Madras we have examples of both methods. The Madras Government Trade School in Georgetown is attended by apprentices and young workmen from most of the principal works in the City. They nearly all attend for three lessons of two hours each per week and many of the employers are willing to allow these youths time off-duty to attend, whilst a goodly proportion even pay the fees of the lads in their works. A branch of the school is conducted for over 100 of the apprentices in Perambore Railway works. That branch is conducted in the works compound, and the classes are held in working hours. The Railway pays to Government the amount spent on the teachers' salary, provides the building and all equipment and materials used, and Government provides the organization and supervision. Messrs. P. Orr & Sons with Government Grant-in-Aid, up to half the cost, also conduct classes for their boy workers, and I can assure you, gentlemen, that in these three groups of classes very good work indeed is being accomplished. The general method of providing industrial training in this Presidency, however is by means of full time, or in few cases, half time aided industrial schools, and because workshops are few and more perhaps because apprentices in these workshops are troublesome to train and difficult to hold until fully trained, these schools fill a real need and the youths in the 40 aided industrial schools and the Government institution at Madura have very little difficulty in securing employment on completion of their training. The half time school, I may say, is a type of institution which I do not particularly favour, but India, as most of us are painfully aware, is a poor country, a conservative country, and a land of compromises. The average Indian worker is not inclined to worry over much about to-morrow if he is sure of his food to-day, and working class parents will not as a general rule make the sacrifices which are common with parents in my country to allow their children to obtain all the benefits of the education available. Whilst the Scotch workman aims at giving his son a chance to rise to a higher position than he himself has been able to attain and will make extraordinary sacrifices towards that end, the Indian artisan parent seems to consider that what was good enough for him is good enough for his son, and if he himself is uneducated he cannot see the benefit of education for his son, particularly if it means the sacrifice of possible earnings on the

boy's part, and the payment of school fees in addition and so the struggle from the cradle to the grave goes on, perpetuated perhaps to some extent by the caste system of "carpenter father, carpenter son", and "weaver born, weaver bred," but there it is; and finding the difficulty of getting lads with a reasonable education to enter on a full time four years' course of training almost if not quite unsurmountable, I have tried by following Indian traditions and effecting a compromise, to do what I can in some cases with half time conditions. I find for example that a parent will often allow his boy to get as far as Standard II and in fewer cases up to Standard V before he looks to the lad for a contribution towards the home expenses, and I have therefore in some cases advocated taking boys of Standard II into aided industrial schools as half timers in the hope that in two years' time their work in school will be worth a few annas per day and sufficient at least for the parent to allow the lad to remain on half time up to Standard V, and full time thereafter his earnings from the school workshop contributing increasingly every year to the family exchequer and staving off the evil day when the parent shall demand that the lad contribute as much as will cover his entire maintenance and a bit over. In dealing with questions of education in this country there is the ever present danger that we may look at things too much from the Western point of view and attempt to impose purely Western institutions on Indian conditions. Conditions in the West and the East are however so vastly different that it does not follow that what is suitable for Europe will suit India equally well. Conditions in the East itself are for that matter so different that what suits one Eastern country, Japan for example, may be quite unfit for introduction into another Eastern country, India for example. In Britain it is a principle of general education that it should be well balanced and general in character, and that no attempt should be made to specialize until the pupil is about 14 to 16 years of age. There is no caste system and a family of six brothers may receive the same education up to age 16, and then start out to learn different trades and occupations. Few firms care to take in apprentices below the age of 16 and all that they expect of these recruits is that they should have a good all round education as a foundation for their training as apprentices. In some manufacturing districts where it is recognized that a large percentage of the boys leaving school will have to work at the parti-

cular trade which the town or district specialises in a midway sort of school termed a "Preparatory Trade School" is run to take working class boys with a general education up to age 12 or 14 and continue their general education on lines based towards the particular industry of the neighbourhood until age 15½ or 16, with the idea of giving the employer a better trained recruit to start on, and to some extent weeding out the lads who are unfitted by nature of workshop conditions. Even in those Preparatory Trade Schools no attempt is made to teach definite trades. If the local industry is of a manufactory nature, the school curriculum will include a considerable proportion of practical mathematics, mechanical and freehand drawing, workshop practice in wood and metal from the student's own drawings, and so on, the course being designed to make things easier for the boy when he enters the works or mill as an apprentice, carpenter, fitter, turner, smith, or some other such occupation. If the industry in the locality is, say pottery, the Preparatory Trade School will include in its curriculum subjects calculated to help the future workers in that industry, and some of these schools also run a paralld course where the subjects are book-keeping, commercial geography, and general knowledge calculated to be useful to the future office worker.

The point which I wish to emphasize is that even these Preparatory Trade Schools do not recruit pupils before they have had a general education up to at least age 12 and general age 14, and that their curriculum does not specialize for single definite trades, but for groups of trades. The lads really begin to specialize in evening or day continuation classes after they have finally decided which trade they are to follow and have entered on their apprenticeships.

If we follow the Western idea that a lad should be educated up to 15½ or 16 before he begins to specialize we must rule out the half time school which takes in boys at Standard II. But if we accept the caste system of "carpenter born, carpenter bred" and say that a man's birth settles his occupation in life, then the half time school has a claim of place in our educational system. Following that line we may start weaving half time schools in weaving communities, shoe-making half time schools for the children of chucklers, and so on. In cities, the difficulty is not so acute and so far as imported industries like mechanical engineering and motor engineering are concerned, caste has little effect, and men of different castes

work side by side, but in the villages and in the case of indigenous trades like carpentry, even in towns, castes do affect conditions. Are we to take the Western idea as our guide and say that a boy should be educated first up to an age when he can to some extent decide for himself and then be put to whatever trade seems to offer best prospects? Or are we to accept the fact that caste must be considered and for the time being at least encourage these half-time schools in certain localities?

I am inclined to favour the idea of using these half-time schools here and there where they appear to serve a useful purpose for a few years at least, but I should welcome the spread of general education as a means of making them unnecessary. The problem is no doubt to a great extent economic and I should prefer to leave to Indians to work out the solution. I will cheerfully do my best to carry out the views of the majority as represented by the orders of Government when a decision is arrived at. Meantime, I can only consider different schemes for different localities as they arise and do my best with them.

In Madras we have the continuation classes in the Trade School where apprentices study subjects directly connected with their trades, but we have no Preparatory Trade School and many boys in Madras start to learn trades and then find that their previous training is not just what they require to enable them to make a success of their lives. Many of these lads drop out and I fear some of them go under, after wasting months or even years in a vain endeavour to succeed as artisans. A few plod on and remain just average workers, and a minority make good in every sense of the word and turn out men well worth employing. To counteract this excessive wastage of youth, I hope when the new Trades Schools buildings are erected to establish a Preparatory Trade School in Madras as a feeder school for the local workshops and mills, but I recognize that the conditions obtaining in that school for many years to come will have to be a very much modified copy of the Western model. I recognize further that the Madras Trade School and the Preparatory School leading up to it whilst I believe likely to prove successful institutions in a city like Madras, are not the type of school which can be dumped down at random all over India. Neither of these institutions can do anything towards creating Industries, though they may assist to develop and help industries

where they already exist. When the South Indian Railway workshops are transferred to Trichinopoly a small copy of the Trade School may profitably be started there to prepare lads for apprenticeships in these shops and assist them to get the best out of their courses as apprentices after they start work. In the dim and distant future similar conditions may obtain at Vizagapatam, after the harbour is completed and the port developed, but to make such schools worthwhile the capitalist must be first in the field. He must satisfy himself that the prospective industry is a commercial proposition and start his mills and workshops or open his mines *first* and then ask us to help him to train local labour to replace the imported workers who must start the wheels going. Now whilst I maintain that schools cannot create an industry I don't mean that schools are of no use. The Madura Institute and the 40 assisted schools have little trouble in placing their trained men, but the industries which they cater for exist, undeveloped and scattered and carried on spasmodically perhaps, but they exist; and whilst they exist there will continue to be a demand for the artisans we are turning out. The question is not so much, however, a question of turning out artisans from schools but of making better use of the facilities which exist and should exist more than they do for training men in existing mills and workshops. The present method, or lack of method in allowing uneducated or half-educated boys to enter works and pick up what knowledge they can assisting their fathers and uncles is a deplorable waste of time and a waste of the youth of the country. Where employers are willing to try and to assist these youths to be better workmen than their fathers, they find themselves up against the conservatism of the parent and the awful ignorance of the pupil. Before we can get a beginning made we have two big jobs to do, two people to educate, the father and the child. The father must be educated as to the advisability and advantage of seeing that the boy is educated and not withdrawn from school for the sake of a few annas per day when he can barely read and write. The child must be educated up to a point, where, whatever industrial training we provide, half-time Industrial School, full time Industrial School, Preparatory Trade School, works classes, or continuation classes, has some reasonable foundation to build on, and therefore let us hear no longer that vague catchword "Vocational Training," let us hear more of general education on practical lines for

the masses, let us hear of schemes for introducing Manual Training to keep that general education well balanced; and then after that has been seen to, let us talk of Industrial Education for the prospective apprentices, actual apprentices, and young workers of the country."

APPENDIX V

SYLLABUS IN THE BOOT AND SHOEMAKING COURSE *

I. Year—*Theory*.—Variation in form and character of feet. The necessity of careful measurement. What a measure requires. The elongation of the foot under pressure. How to measure for short and long work. Directions for taking the heel measurements, ankle measurements and when to take it, allowances and fitting.

Selection of skins for uppers and the various classes of linings used. Fitting, closing and various machine threads used and their strength.

Practical.—Blocking, feathering and holing insoles, lasting and welt-sewing, welt-pairing and bottom-filling.

II. Year—*Theory*.—The antiquity of the Last. The object for which lasts are employed. Thin and thick stockings and their influence on fit. How to increase the height of instep. Choice and purchase of materials. Economical adjustment of patterns. Cutting and fitting up of bottom stuff, etc.

Sewing, stitching, threadmaking, finishing and dressing. Boot repairing.

Practical.—Sole fitting, stitching, heel building, pairing and finishing. Making up of costings.

* Kindly supplied by the Director of Industrial Schools, Madras, for the President, Taluk Board, Adoni, Bellary District, Madras Presidency.

APPENDIX VI

A SUGGESTED SYLLABUS FOR THE TEACHING OF
HYGIENE IN VILLAGE SCHOOLS

BY W. J. MCKEE

In this syllabus considerable use is made of the Hygiene story, drama and demonstration, but the greatest emphasis must always be placed upon the formation of desirable health habits. For this reason, the course for each class is divided into two parts; (a) Information to be secured and (b) habits to be formed. The latter is the more important, and unless the work in Hygiene results in *correct habit formation*, it has been a failure, no matter how much information about Hygiene the pupils have secured. For this reason the teacher should stress the *inspection* of the hygienic condition of class-room and pupils, above any other form of effort in this subject so that the emphasis may be placed on what children *do* and not upon what they *know*.

An examination of this syllabus will also show that very little of physiology or anatomy has been included in it. Pupils of the Primary School are not able fully to understand these subjects, and fortunately it is not necessary that they should understand the construction of their bodies, before they learn how to take care of them. The emphasis should be on how to do a thing of hygienic value, and not so much on why it should be done. Pupils should learn how and when to brush their teeth, and regularly do this, long before they understand the construction of the teeth and how keeping them clean prevents their decay.

Also an effort has been made to include some *community hygiene* along with the personal hygiene. This begins in the school-room, where the pupil has an opportunity under guidance, of applying what he has learned. Then comes the application of these principles and habits in the home and then follows a study of the community. Elementary first-aid, such as the treatment and bandaging of cuts, wounds, stings, etc., is also included, as is also some instruction on "Guarding against accidents," which is so necessary even for young children.

Examinations in Hygiene should include marks not only for hygienic information, but for hygienic living. In fact where a pupil

knows a good deal about hygiene, but practises little, he should receive a low rating. If our aim is to make hygiene valuable in life situations, it is the latter which should receive greater emphasis and commendation. Only as the emphasis is continually placed upon application and practice, will we reach our main objective in Hygiene, which, as has been stated many times heretofore, is the formation of correct habits of healthful living.

COURSE IN HYGIENE—FIRST STAGE

Instruction to be given through stories, dramas, informal discussions, hand-work, experiments, demonstrations and hygienic inspection.

I.—INFORMATION TO BE ACQUIRED.

(A) *Personal Hygiene—Cleanliness—Face and Hands.*—Need of frequent washing of face and hands. (Excretions from the skin). Stories of why this must be done after (1) sleeping, after (2) eating, after (3) working or exercising. Why the hands should be washed: (1) before meals, (2) after meals, (3) before drinking, (4) after working, (5) after going to toilet, (6) after attending the sick. (Draw a poster or chart illustrating this). Demonstrations of how hands and face should be bathed. (Use of individual soap, and towel). Danger from use of common soap, and common towel (One used by others)—Story. Draw a poster illustrating this).

Nails.—Why our finger nails should be clean, (Story). How to cut the nails. How to clean the nails? (Demonstration.) Danger from scratching a wound. Fingers and nails should not be put in the mouth.

Body.—Why we perspire. Why we need to bathe. How often we should bathe. When we should bathe. Precautions to be used. How we should bathe. Different kinds of baths: (hot, cold, shower). Effects of bathing. (Story.) Value of a brisk rub afterwards.

Head.—Why the head needs to be kept clean, (Story). The danger from the head and body; lice (diseases they carry). How the head should be washed. (Demonstration.) How often the head should be washed. Use of brush and comb. (Demonstration.) The uselessness of hair oils. (Use individual brush and comb.)

Teeth.—Purpose of the teeth. (Story or Drama.) Don't crack nuts or bite thread with teeth. Don't pick the teeth with any hard

substance. How to clean the teeth (Demonstration). Need of keeping them clean. When the teeth should be cleansed. Proper care of the tooth brush. Rinsing the mouth.

Make a chart showing what health habits we should observe. Drama regarding the need of cleanliness.

(B) *Community Hygiene.—Cleanliness of the School.*—Correct way sweeping and dusting rooms. Adequate ventilation. (Story.) Removal of dust. (Demonstration.) Correct way to clean blackboards. Correct way to clean slates and tahkties. Disposal of chalk dust. Disposal of waste paper and refuse. A clean school compound—proper Drainage. Beautifying the school compound. (Demonstration.)

Care of the eyes (Demonstration) Protection from the sun, protection from dust. Correct way of holding a book. Correct way of sitting with reference to the light.

Correct posture; sitting, standing. (Demonstration.)

Proper Exercise.—Balanced Work and Play Periods.

Taking care of one's belongings—books, slates, pencils, etc.—Neatness.

Protection of Drinking water. Good manners in the school-room.

Draw a poster illustrating some phase of the Hygiene of the class-room.

II.—HABITS TO BE FORMED.

1. Daily bath.
2. Washing face, 2 or 3 times per day.
3. Washing hands before and after meals, before drinking, after working, after going to the toilet.
4. Use of one's soap and towel.
5. Nails to be kept cut, and cleaned several times daily.
6. Clean heads—kept clean by bathing and brushing.
7. Teeth to be cleaned; before going to bed, early in the morning. (Directions and Demonstration as to how the teeth should be brushed.)
8. Proper cleaning of blackboards, slates, etc. Using receptacle for waste and refuse. Correct posture. Orderliness. Efforts to beautify school and surroundings. Good manners. Teacher should make daily inspection of the hygienic condition of his class-room, of the personal cleanliness of the pupils, (faces

hands, brushed hair, teeth, nails, clothing) of sitting and standing, postures of pupils, of the lighting and ventilation of the school-room.

(Try to arouse pride in cleanliness of person and belongings.)

HYGIENE—SECOND STAGE.

Instruction to be given through stories, dramas, informal discussions, hand-work, experiments and demonstrations, and hygienic inspection.

I.—INFORMATION TO BE ACQUIRED.

(A) *Personal Hygiene.—Cleanliness.*—*Care of the eyes.*—Importance of sight. (Story.) Why so many people have sore eyes in India. (Story.) Use of the pupil, lids, lashes and brows. How to take care of the eyes. (Demonstration.) (Carefully wash them. Use of Boric Acid solution.) Don't put hands on them. Don't rub them with a dirty cloth. Don't let flies rest upon them. Danger from facing the light. Danger from using eyes in poor light. Danger from the glare of the sun. Danger from dust. Testing of eyesight. Use of glasses. How they help us to see. How to remove dust, etc. from the eyes. How to sit with reference to the light. (Demonstration.) Right distance to hold the book from one's face. Drama worked out on the proper use and care of one's eyes.

Care of the Ears.—Importance of hearing. (Story.) Proper use of the ear. What earwax is for. Right and wrong ways of removing it. Cleanliness of the ear. The care of the ear. Training the ear. Testing of the ear (Demonstration).

Care of the Nose.—(Elementary study of nose and throat. Excretions from these). Why should we breathe through the nose. Importance of smelling. (Story.) How the nose and throat should be kept clean. Danger from picking the nose. Use a clean handkerchief. Danger from a soiled one. Put handkerchief before nose and mouth when coughing or sneezing —Why? Blow nose gently. Story of the city where one is arrested for spitting or cleaning out one's nose on the street.

Accident to the nose and their treatment. Exercises in breathing.

Catching Cold.—How to prevent colds (Draw a Poster). What to do for a cold. (Preventive measures)—Demonstration. How to protect the nose and eyes from dust.

Care of the Tongue.—Importance of taste (Story). What we learn by tasting; danger of destroying the power of taste with strong

spices, alcohol and tobacco; of becoming a glutton because of a liking for some food; why the mouth should be cleansed after meals; what a coating on the tongue denotes; danger and filthiness of the spitting habit.

Don't put pencils or other things in the mouth. Don't clean slates with the fingers. Don't wet fingers to turn the pages of a book. Correct use of the voice and throat.

Care of Clothing.—Why we wear clothing? Need of warmth for the body. (Story). How clothing keeps us warm? Kinds of clothing to wear, use in winter and summer, effect of tight garments; need of frequently changing clothing; Excretions from the skin: How clothing should be washed (Demonstration). How sunned and aired; advantages of this, how cared for. How to prevent cold and chills. Importance of removing wet clothing. Proper type of shoes—not too large or small. (Cleaning of shoes.)

(B) *Community Hygiene—Guarding against Accident (Story).*—Danger of playing or walking on the street; in crossing the railroad, or street; in running after and riding on moving vehicles; in rough sports on the playground. Don't throw stones or things at others; Don't run with pencils, etc., held between the teeth; Don't play with fire or matches.

Application to the home of the hygiene learned regarding the school-room.

House Shelter.—Why we need shelter. (Story.) Different kinds of houses. Need and location of doors, windows and roshandans. How the house can be properly aired? How ventilated? Demonstration. How prevent draughts? Need of cleanliness. How the house should be swept—How dusted? How kept tidy and neat? How made comfortable? Care of bedding and beds. Value of sunlight. How the home can be made comfortable? Healthful conditions surrounding houses (disposal of garbage-wastes and dirt). Sanitary drainage—How to disinfect rooms and grounds? Advantage of whitewashing. How to keep dirt and dust out of the house? Use of a door mat. Never permit animals or chickens in the house. How to keep flies away? How to get rid of flies, mosquitoes, rats and other dangerous pests. The danger from the fly, mosquito and rat. (Draw a poster picturing the danger from mosquitoes and rats.) Drama—The fly as an enemy.

II.—HABITS TO BE FORMED.

1. Daily bath.
2. Frequent washing of face and hands.
3. Care of finger nails.
4. Care of teeth.
5. Care of head and brushing of hair.
6. Care of eyes, ears, tongue, throat and nose.
7. Proper way of sitting with reference to the light.
8. Clean clothing and shoes.
9. Clean personal habits.
10. Guarding against accidents on the street and playground.
11. Cleanliness of house and surroundings—ventilation, lighting, etc.
12. Destruction of flies, mosquitoes and rats—Destroying their breeding places.

EASY EXERCISES FOR SENSE TRAINING.

The teacher should make a daily inspection of the hygienic condition of his class-room, (Cleanliness, air, light, etc.) Also an inspection of the cleanliness of pupils regarding above 12 things.

The detail thus far given for earlier stages of the instruction will illustrate the principles advocated in those articles with the object of bringing the teaching home to the pupil and moving him to take the lessons seriously and act upon them in the daily life. Though the syllabus has been, for convenience, divided into four stages, these need not be treated as corresponding exactly to the four classes of a primary village school, though the more the teacher is able to carry through without trespassing on other parts of his work, the greater the benefit to the pupil and eventually to the villagers of whom he is one.

THIRD STAGE

Instruction to be given through stories, dramas informal discussions, hand-work, experiments, demonstrations and hygienic inspection.

I.—INFORMATION TO BE ACQUIRED.

(A) *Personal Hygiene—Posture.*—How to sit properly. How to stand properly. How to walk properly. (Stories told of good or bad effect of posture. Different kinds of seats, standing positions, etc., which are healthy). Demonstrations. "How (X) got a crooked

hip from carrying her sister when she was a little girl". "How (Y) became so straight and tall from carrying things on her head." "How (Z) a professional beggar, got his crooked and useless hand". Demonstration of correct postures.

Food.—How and when we should eat. Need of food for our bodies. (Story.) Eat slowly, chew food thoroughly. Do not open mouth or make any noise when chewing food. Do not fill mouth too full; do not eat too much; eat at regular times; do not eat between meals; do not drink water with meals; eat vegetables and coarse food: eat little candy; don't eat when tired or overheated; don't have any violent exercise after eating. Carefully wash hands and clean nails before eating. Do not pick teeth. Need of clean dishes, need of cleanliness in cooking food. (Use Story drama and demonstration to teach these things).—*Discuss polite manners while eating.*

Drink.—How and when we should drink. Need of water for our bodies (Story). Why we should not drink during meals, or when overheated. We should drink when we get up in the morning. Why?—Often during the day. Why?—How much should we drink in a day? How to drink. Danger from using a common cup—must have clean hands, if drinking from the hands.—Cleanliness is necessary in all things. (Demonstration.) Cleanliness of surahis or water vessels. Protection from dust. Danger from dipping water out of a water vessel. Review—Danger from cleaning slates or blackboard with fingers. Danger of wetting fingers to turn pages of book. Danger of putting pencils, fingers, etc. in mouth.

Air.—Why we need air. (Story.) Good and bad air. What is pure air. Bad air. How pure air is spoiled. How purified. Difference between inhaled and exhaled air. (Experiment.) How to get rid of bad air. How to secure good ventilation and change of air. Demonstration. Why should we breathe through the nose. Why breathe deeply. (Breathing exercises.) Why keep the mouth closed. How to protect ourselves from dust and cold. How protect the nose and eyes from dust. How keep the nose and throat clean.

ACCIDENTS TO NOSE AND THEIR TREATMENT.

How to secure fresh air—by day and by night. Danger of covering head at night. Danger of draughts. How prevent them. (Demonstration). Danger from colds. How prevent colds.

Rest.—Why our bodies need rest. (Story). Amount of rest needed. Sleeping is perfect rest. Amount of sleep needed. Early to bed—early to rise. Harm from late hours. How we should sleep. (Demonstration.) Danger from sleeping on the ground. Plenty of good air necessary. How to ventilate a sleeping room. Head uncovered. Partial rest during the day. Change of work is rest time. (Drama on value of fresh air and sunlight.)

Exercise.—Regular need of exercise. (Story.) Why out-door exercise is best. Walking, marching, running, swimming, games, use of recess.

Exercise.—Effects on (a) Digestive system, (b) Circulatory and Muscular system, (c) Nervous system. Other values of games and exercise.

(B) *Community Hygiene.*—*Elementary First Aid.*—Treatment of punctured wounds from pins, thorns, needles, rusty nails, splinters (Demonstration).

Treatment of cuts, wounds and bruises. How to bandage a finger.

Further study of the hygiene of the home.—Cleanliness in cooking; clean food, clean dishes and cooking vessels, protection from flies. Disposal of garbage and wastes.

Protection of milk and water; of food remaining over from any meal. Surroundings of house. Don't keep animals near; don't allow water to stand and become stagnant. Consider dirt an enemy.

II.—HABITS TO BE FORMED.

Constant emphasis on desirable habits stressed in previous grades, both regarding personal and community hygiene. (See habits in grade II.)

Also add to these, correct posture in the school-room; sitting; standing. Check up pupil's habits of eating and drinking in their homes—also sleeping habits. Supervise the games and recreation and create a love for the out-of-doors. Endeavour to bring about better hygienic conditions in the homes and community. Provide as much practice as possible in simple First-Aid.

The teacher should continue the daily inspection of the personal cleanliness of pupils and should also inspect the hygienic condition of the class-room. Responsibility should be placed upon the pupils for the cleanliness and orderliness of the class-room and its surroundings.

HYGIENE—FOURTH STAGE

Instructions to be given through stories, dramas, informal discussions, hand-work, experiments demonstrations, and hygienic inspection.

I.—INFORMATION TO BE ACQUIRED.

(4) *Personal Hygiene.—Living things.*—What we need; food, air, water. How they grow. Notice habits of animals, good or bad.

Food.—Character of food. Why we eat food. (Growth, Heat, Strength). (Story). (Brief and simple explanation of the physiology of this). Digestion in the mouth, stomach and intestines—(Chart). Different kinds of food. What foods must contain. The kinds of food needed. (Poster). Relative value of different kinds of food. Comparison of food values. Foods easily digested—difficult foods. Time required for digestion. Variety of food needed. (Poster). How to prepare food. Value of cooking. Need of cleanliness. Need of regular time for eating. What happens to food when dropped on the floor. How germs spoil food. Danger from raw or cold foods. Don't eat food exposed to dust. How to keep food from spoiling. Danger from leaving food exposed to flies. Quantity of food necessary. (Pupils to work out drama on foods).

Drink.—Need of water for our bodies. (Story). Water as the best drink. Sources of drinking, water—well, spring, stream, etc., Which is best. Why water is sometimes impure. How purify it. Boiling, filtering, setting. Use of chemicals. What these do to water. How to protect the water supply (Poster). Proper location and care of wells (good and bad wells). Dangers from impure water. (Story and Poster). Various diseases caused; don't rely upon clear water as pure. Water for washing, why it should be soft; how make it soft. Washing water should not be put in the mouth. How dispose of dirty water. Dangers of bathing in dirty water. Tanks and their dangers.

Harmful Foods and Drink—Harmfulness of the following:—

Harmful effects of condiments and strong spices. Harmful effects of tea for children.

Harmful effects of alcohol: STORIES.—Relation of alcohol to athletics.

"	"	"	"	Work and endurance.
"	"	"	"	Skill (many accidents):
"	"	"	"	Brain power.

Harmful effects of alcohol: STORIES.—Crime and Poverty (Burden to society.)

"	"	"	"	Health (in detail).
"	"	"	"	Children.

Resistance to disease:—

World fight against alcoholic liquor.

Work out a drama on temperance.

Harmful effects of tobacco and drugs.—

Cigarettes, huqqa, chewing tobacco, opium, etc. Fingers of the cigarette smoker (need of temperance).

Make a poster showing the evils of tobacco.

Review the work of Previous Grades.

(B) *Community Hygiene.*—Study of a nearby town, regarding the provision it makes for the health of its residents, with the idea of applying some of these plans to the village, so as to bring about better hygienic conditions.

(1) *Provision for pure water.*—What arrangements are made regarding the testing and purifying of well water; the prevention of surface drainage, the cleaning of wells, etc. How can these be applied to the village.

(2) *Disposal of wastes.*—What arrangements are made for the disposal of body wastes, of house garbage, of street refuse. How are the streets kept clean; how are they drained; how are the drains cleaned; how is the dust kept down. Application of these methods to rural communities.

(3) *Provision for pure food.*—Markets; inspection of food; protection from flies; special protection of milk. Visit to a market or model dairy, if possible. Control of prices.

(4) *Prevention of Disease.*—What is done for the destruction of mosquitoes and rats; reporting contagious diseases; isolation; quarantine; inoculation, disinfection; care of the sick; Medical inspection; Health Lectures; maternity and child welfare.

(5) *Recreation.*—What is done by the community for the provision of necessary exercise and recreation?

Simple First Aid.—Treatment of a burn; of a sprain; a sting from a wasp, scorpion or snake.

How to stop bleeding.

How to resuscitate a drowning boy.

What to do in case of fire.

II.—HABITS TO BE FORMED.

Review and emphasize habits taught in previous grades. Add to these, correct habits with regard to eating and drinking, cooking, boiling or purifying water. Also practice in First Aid. Also motivate the Community Hygiene so that pupils will strive to bring about better conditions in their villages. The teacher should be the leader in bringing about improvements.

The teacher should also have a daily inspection of the hygienic condition of his class-room and the cleanliness of his pupils.—*The Punjab Educational Journal*, April, 1922.

APPENDIX VII

The following letter has been received by the author from the Director of Agriculture, Madras, in reply to an enquiry made by him as regards the usefulness of the present course in Agriculture as a subject in the C Group of the Secondary School Scheme.

AGRICULTURAL DEPARTMENT

612—22.

24th May, 1922.

From

H. C. SAMPSON, ESQ., B.Sc., C.I.E.,
Officiating Director of Agriculture,
Madras.

To

DR. VEPA VARAHANARASIMHAM, M.A.,
PH.D., F.R. ECON. S.
Vizagapatam.

Sir,

In reply to your letter addressed to Mr. R. C. Wood which has been referred to me, I have the honour to inform you that I am trying to get information from the Education Department as to how much time in the curriculum of these schools will be available for teaching agriculture. As far as I can make out from the syllabus for the S.S.L.C. the proposed teaching of this subject . . . will be limited to 35 lessons a year—presumably to include practical as well as theoretical teaching. If this is so, then it is in my opinion *useless* to attempt to teach agriculture.

I will write to you further however, when I hear from the Director of Public Instruction.

I have the honor to be,

Sir,

Your most obedient servant,
(Sd.) V. S. VISVANATHA RAO,
for Director of Agriculture.

True Copy.

If thus in the opinion of the Chief Agricultural Adviser to the Government in this Presidency, the course in Agriculture on the lines of the present syllabus be quite useless in the S.S.L.C. Scheme, it should be much worse in the case of Elementary School Scheme in which also, provision, though nominally has been made for the teaching of the subject as an optional (particularly in the Higher Elementary School).

APPENDIX VIII

SYLLABUS IN MECHANICAL ENGINEERING ADOPTED
AT THE GOVERNMENT TRADE SCHOOL, MADRAS

THEORETICAL AND PRACTICAL

I Year

Iron and Steel.—Different kinds of iron, their composition; Influence of different constituents; Elements of smithy and forging; Smithy tools, open and hollow fire hardening and welding; flux used in welding.

Principles of fitting.—Fitter's tools; preparing chisels; grinding; hardening and tempering chisels, files, callipers, square scribing, block, bevel slot gauge, etc.

Patterns and pattern making.—Materials used; allowances for contraction, tools used, names of various joints, pulley pattern; Method of making arm joints.

Foundry work.—Principles, moulding, moulding sands, green and dry sand moulding, loam work; Cores and core boxes, cupola practice and casting, types of blowers.

Lathes and their Construction.—General outline of mechanism ; Lathe tools, correct method of grinding and setting same ; plain turning and marking off work.

II Year

Screw-cutting by the lathe.—Calculation of change of wheels ; Simple and compound gearing, right and left hand threads, picking up threads and chasing, etc., various types of threads and their features, square, buttress knuckle, etc.

Drills and drilling machines.—Drills, flat drills, twist drills, taper and parallel shanks, grinding and grinding drills. Marking off work ; Shaping, planing and boring practising ; punching and shearing machines ; Milling machines ; Portable machine tools, reamers, taps, dies and ratchet braces ; Elementary mechanics ; Force, matter, Unit of force ; Elements of force, Forces in equilibrium, Graphic representation of forces ; Action and reaction ; resultant force ; Work ; Unit of work done against variable resistance ; Diagram of work ; Power, limit of power ; Horse power.

Practical.—Screw cutting, centering work for drilling ; forging bolts and nuts, other fitter's work ; marking off work.

III Year

The moment of force.—Principle of moments applied to levers pressure on and reaction from the fulcrum ; Centre of gravity ; the lever when its weight is taken into consideration.

Practical application of the lever.—Steel yard, lever safety valve, bent levers, bell crank lever pincers.

The principle of work.—Work put in, work lost, useful work ; efficiency of a machine ; principle of work applied to a lever ; wheel and axle, with barrel, ships-capstan, etc., pulleys, snatch block and tackle, velocity ratio, actual or working advantage.

The wheel and compound axle.—Weston's differential pulley block, work applied to it.

Graphic demonstration of forces in equilibrium.—Parallelogram of forces ; triangle of forces ; stresses in a jib crane, stresses on simple roof inclined plane and principle of work applied to it friction ; heat developed when force overcomes it ; angle of repose or friction ;

Lubrication.—Different systems of lubrication ; Anti-friction wheels ball-bearings, work done on inclines including friction. Belt-fasteners and splicing of belts, etc., driving ; difference in tension ; brake horse power transmitted by belts ; velocity ratios, open and crossed belts, fast and loose pulleys ; Stepped speed cones ; shape of pulley face.

IV Year

Velocity.—Ratio of two friction discs ; pitch surfaces and pitch circles ; pitch of teeth in wheel gearing ; Rack and pinion, velocity ratio in wheel gearing ; Principles of work applied to wheel gearing ; stress, strain and elasticity ; tensile compression and shearing stresses ; Yield point ; Factor of safety ; Strength and stiffness of beams ; Bending movement and shear diagrams ; Commercial tests ; twisting ; Moment of a shaft ; Rivets, riveting and riveted joints ; strength of cylindrical and stayed surfaces ; Bursting pressure of cylinders ; hydraulics ; principles of hydraulics ; pressure due to a given head ; flow through orifices ; Bernoulli's theorem ; Venturi metre ; hydraulic gradient ; hydraulic pressure machines ; Cranes, lifts, pumps and accumulators ; hydraulic turbines ; impulse and pressure types.

V Year

Heat.—Properties of heat ; British thermal unit of heat ; Mechanical equivalent of heat ; combustion of fuel ; fuel economic ; prevention of smoke ; boilers ; types of boilers ; boiler fittings and accessories ; Boiler construction ; care of boiler ; boiler repairs renewal of a tube, fixing of a patch.

Scales and their formation.—Removal and prevention water softeners, steam, saturated steam ; Super-heated steam, generation of steam ; properties of steam ; Boyle's law ; sensible and latent heat ; work of expansion ; Brake and indicated horse power ; Indicated and indicator diagram ; calculation of I.H.P. ; compounding steam.

Simple engines.—Slide valve, valve diagram and crank effort diagram ; Effect of fly wheel governing and governors ; types of engines and their special features ; types of condensers and air pumps and steam traps, etc., internal combustion engines ; gas, oil and petrol engines ; Four stroke, two stroke and Diesel types, gas producers, suction producer and Dawson gas producer ; Diesel engines, steam turbines Parsons, Curtis and Rateau types.

SUGGESTIONS FOR FURTHER STUDY.

Those who are interested in this subject would do well to keep themselves in close communication with the work of the International Harvester Company of the United States.

1. *Some Principles of Teaching as Applied to Lessons in Agriculture* by Col. Hicks, Senior Inspector of Schools, Jamaica.
2. *Rural Schools in Central Provinces*, by Sharp.
3. *A Policy of Rural Education*, by S. H. Freemantle, I.C.S., C.I.E., with a Foreword by Sir James Meston, K.C.S.I., (Pioneer Press, Allahabad).
4. *Rural Primary Schools*, by Sir James Meston, K.C.S.I.
5. *Indian Cottage Industries* (Bulletin of the Madras Department of Industries).
6. *Report on the Expansion and Improvement of Primary Education in Bengal*, by Evan E. Biss, Esq., I.E.S., (Bengal Government).
7. (a) *Teaching in Indian Elementary Schools*, by Miss Gordon.
(b) *How to Teach the Pariah*, by Mrs. Courtright.
8. *Village Education in India*, (Oxford University Press).
9. *Schools with a Message in India*, by Dr. Fleming.
10. *Rural Re-construction in Ireland*, "by Lionel Smith—Gordon."
11. *Issues of the Local Self-Government Gazette*, containing useful topics on Popular and Village Hygiene; and the cheap bulletins 1, 2, 3, 4, 10 and 12, of the Education Committee of the Mysore Economic Conference to be had of the Curator, Mysore Government Book Depot, Fort, Bangalore City.
12. *Country Life and the Country School*, by Mabel Carney Row.
13. *The Rural Teacher and His Work in Communal Leadership in School Administration, and in Mastery of the School subjects*, by H. W. Foght.
14. *Self-Government and the Breal Problem*, by Capt. Patavel, R.E. (Retd.)
15. *Man and the Machine Power* by Capt. Patavel, R.E. (Retd.)
16. *Arithmetic for farmers* by Pawar and Ghumare, Bombay Government.
17. 81 Vol. *Journal of the Royal Agricultural Society of England* dealing with Agricultural Education in Denmark.

18. *Vocational Education*, by Sneddon.
19. *Manual of Agriculture in India*, by Clouston.
20. *The Bases of Agriculture Practice and Economics in the United Provinces*, by H. M. Leake, Director of Agriculture with a Foreword by J. Mackenna, C.I.E., I.C.S., Agricultural Advisor to the Government of India.
21. *The School of the Future; a School of Manual Work*, by G. M. A. Kerschensteiner.
22. *The Schools and the Nation*, by G. M. A. Kerschensteiner.
23. *Education for the Needs of Life*, by Miller (Macmillan).
24. *The Open Air School*, by H. Broughton.
25. *Vocational Guidance*, by M. Bloomfield.
26. *Education for Efficiency*, by E. Davenport.
27. *Vocational and Moral Guidance*, by J. B. Davis.
28. *The Worker and the State; a Study of Education for Industrial Workers*, by A. D. Dean.
29. *Industrial Education; its Problems, Methods and Dangers*, by A. H. Leake.
30. *Pre-Vocational Education in the Public Schools*, by F. M. Lenirth and E. Brown.
31. *Vocational Education*, by E. Robinson.
32. *A Handbook of Vocational Education*, by J. S. Taylor.

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* Hon'ble De La Foss and Messrs. Biss, and West strongly support the claims of English as a subject in the Primary Educational schemes of U.P. and Bengal, respectively.

