EDUCATIONAL INDIA

Vol. XLIII
No. 10

April, 1977

★

INNOVATIONS

Educational innovations
rtainly do not come about
tomatically. They have to
invented, planned, initia-
, and implemented in a
that will make educa-
l practices more ade-
ly geared to the chang-
ectives of instruction
e them more con-
with the changing
ards of instruction.

TORSTEN HUSEN

★

India's Leading Educational Journal

A FORUM OF EDUCATION — TO LEAD AND TO INSPIRE

	ANNUAL	
INLAND	Rs.	10-00
FOREIGN	Sh. 15:	$ 2-25

Office:
Vidya Bhavan
MACHILIPATNAM
(S. India.)

To the student, it is informing and instills in him a desire for discipline and love for his *almamater.*

When placed on the table, it not only inspires the Teacher and the pupil in school and college but also the multi-reading public in Library and Reading Rooms.

Published on the 5th of the every month, with a Bimonthly for May and June (Summer vacation.)

The year begins from 1st July. But subscribers may enrol themselves for any of the following periods:

July to June ... Academic year
Jan. to Dec. ... Calendar year
April to March ... Official year

☞ All subscriptions payable in advance by M. O. or by Postal Order.

Educational India

Monthly Devoted to Indian Education

Founder Editor:
'Padmabhushan' Prof. M. Venkatarangaiya
M. A., D. Litt

★

BESIDES ORIGINAL CONTRIBUTIONS and INSPIRING EDITORIALS the Magazine serves as a professional guide to all teachers and educational administrators.

News from different states of the Indian Union; informative material from Unesco and other progressive countries of the world; Public Opinion on different aspects of Education; Experiments and other Organisational matters etc., form different special features of the Journal.

* * *

ARTICLES intended for Publication should reach the Editor, 'Educational India', Vidya Bhavan, Masulipatam by the 10th of the month prior to publication. THE VIEWS expressed by individual authors are their own and do not necessarily represent the views of the Journal.

* * *

EDUCATIONAL INDIA is published on the 5th of every month. But a Double Number is issued for May and June. Complaints for non-receipt of the Journal for any month should reach our office not later than the 12th of the month. It is requested that the articles be sent exclusively for Publication in Educational India.

* * *

SUBSCRIPTIONS may date from Jan. or July but the year commences from July. Back numbers too will be supplied if available. The annual subscription, *always payable in advance*, is Rs. 10—00 Inland, and Sh. 15/- Foreign, and it may be sent by Money Order or by Postal Order. Cheques will not be accepted unless the Bank Commission is added on to the subscription amount.

* * *

WHEN SUBSCRIPTIONS EXPIRE, an intimation will be sent along with the last number with which the subscription expires. All remittances are payable to the Manager.

* * *

ADVERTISEMENT RATES are furnished on application. The payment for advertisements is strictly in advance, except where approved accounts are opened.

"Educational India" Office
MASULIPATAM (S. India)

Vol. 43 : No. 10 April, 1977

EDUCATIONAL INDIA

By **Shri R. C. Wadhera**, M. A., M. Ed.,
Sainik School, Chittoorgarh - 312001

The Centralised System of Examination

Why and What of Examination

ADMITTEDLY, what is tested and the manner of testing affect the course and content of teaching; its quality, direction and effectiveness.

We may condemn public examinations, conceived and controlled centrally, as a necessary academic evil which assesses traditionally memory and attests scholarship haphazardly. The general protest is that the recall aspect of information is over emphasised, the coverage of pupil growth remains limited, the mercurial subjectivity is inherently present, and the rigidity of educational tradition renders it a glorified fetish The impersonality and distance of this terminal examination endangers the sound techniques of evaluation, and ill motivates the adoption of slipshod ways of teaching and learning. Obviously, despite its defects and deficiencies, the centralised examination is treated as a yardstick of scholastic recognition and a touchstone of teaching efficiency. This uniform evaluative device is termed variously as a screening sieve for distinguishing failure from success (and the next classifications of success), and as a filtering operation to ensure right type and number of admissions into universities and other prestigious professional courses. Despite its controversial validity, reliability and objectivity, none dispenses with its essentiality as a measuring instrument and as a powerful feedback in stimulating and sustaining the right or the wrong type of teaching and learning.

P. B. Ballad, while acknowledging the fallibility of examiners in setting and scoring written tests, had defined examination as an elaborate procedure of checks and balances which prevents an examiner from making a fool of himself. Ideally speaking, a progressively administered examination system should distinguish

between the competent and the incompetent instead of insulating the careful from the careless. Discarding the error of undershooting or overreaching by its excessive simplicity or difficulty, examination should follow faithfully the comprehensive curriculum instead of controlling it capriciously. Then alone will the public examination and its results be approached as an opportunity and a measure alternately. This pragmatic attitude will consolidate the diagnostic benefits of examination in the direction of improving teaching methods and emphasis, and will ensure smooth teaching testing correlation.

Areas of reform

To render centralised examination not a force, a lottery, or a bugbear; and to rescue the learners from its disabling influence, the following two major goals for examination reform inevitably emerge : (i) Improvement of measurement value (ii) Enhancement of pedagogical value. More specifically, these goals envisage scientific reforms in these areas: (a) Eliminating subjectivity and fluke element by making evaluation objective and nearly foolproof. (b) De-emphasising memory, and devoting attention to judging under-standing, critical thinking and application skills (which are prized in the fascinating "New Mathematics", initially converting its image into a source of terror and horror for passive students, uncommitted teachers and conservative parents). (c) Ensuring effective coverage of content by limiting options and increasing the number of questions in objective-based tests. (d) Making evaluation comprehensive by covering the otherwise neglected, non-scholastic areas of pupil growth by awakening and propelling personal and social virtues and value systems in the service of national priorities, democratic principles and moral imperatives within the framework of contemporary realities. (e) Treating evaluation as a continuous process for cultivating regular study habits and adopting remedial measures.

A Comprehensive programme of examination reform falls into two aspects: academic and administrative. These areas are not mutually exclusive, but are complementary and collateral.

Questioning Questions

Academic reform relates to improving questions by making them precise in thought and expression; by linking them with the test-objectives and the visualised content area; by setting them at the standard level of difficulty and competence so as to discriminate and locate the bright, the average and the poor candidates; by assigning proportionate weightage to distinct objectives, content areas, balanced forms of questions provided with suitable time-limits to them; by streamlining scoring procedures with the help of detailed instructions to examiners in the form of "Key" for answers, and by interpreting score through state average, percentile rank and other derived scores; by extending the techniques of evaluation to oral examination, observation, checklists and rating scales; by effecting concomitant changes in curriculum, text-books, instructional materials and technology.

Administrative reform is concerned with rules for admission to an examination in view of subjects studied earlier, and the proficiency achieved; with appointing paper setters, examiners, tabulators possessing suitable qualifications, experience and training; with developing scientifically oriented mechanics of conduct-

ing examination by fixing its schedule periodicity, processing of results; their grading, classifying and moderating; with evolving correct methods about the declaration of result; their publicity and the issue of certificates. Speed, secrecy and soundness of operational work-plan necessitate close collaboration between the State Boards of Secondary Education, the State Department of Education, the State Evaluation Units, the State Institutes of Education, the University Departments of Education and the Training Colleges.

Historical Aspect

Broadly speaking, the Central Examination Unit now functions as a part of the Department Curriculum and Evaluation of the N. I. E. under N. C. E. R. T. Its major preoccupations are (a) Analysis of existing examination channels—its structure, function, and outcomes (b) Development of phased plan of action introducing academic and administrative reforms. (c) Training and development programmes (d) Preparation programmes. (e) Implementation programmes. (f) Followup study and Expansion programmes. (g) Conducting Annual Conference of the chairmen and secretaries of the Boards of Secondary Education, and co-ordinating and articulating their experiences. (h) Work with training colleges includes the analysis of syllabi, the review of innovations experimented, the facilitating of book grants, the arranging of State level and regional workshops, the promoting of action research and orientation courses.

Work areas and Achievements

22 studies of functional importance in external examination have been conducted; six studies in School evaluation are completed; training of paper-setters, examiners for practical and oral examinations, of Resource Persons, of internal assesment evaluators, and the orientation of Training College Staff are being vigorously pursued The Kothari Commission and the National Policy of Education have endorsed the crucial significance of Central Examination Unit. Unerringly has the Secondary Education Commission Report pinpointed that our present faulty examination system curbs teachers' initiative, stereotypes curriculum, routinises mechanical teaching grind, discourages the spirit of experimentation, and stresses wrong things for wrong reasons in education. If these aberrations and vitiations of the traditional examination system are corrected and purged away by systematically introducing and integrating the Internal system of assessment, treating it as an appraisal programme of pupils undergoing a stipulated course of instruction for a definite period, it can bring about the promise of qualitative improvement in education. But the Internal scheme of assessment is not meant merely to certify the level of students' competence. It has to be woven into the totality of educational programme and experience. The decentralised orientation workshops for training teachers into the techniques of educational evaluation are a pre-condition for its smooth compliance.

Cross-bearers of Reform

Convinced of the updating of questions, question-papers, scoring procedures, internal assessment, training of teachers, unit tests in the leavening up of classroom instruction, we have also to preserve the integrity and usefulness of examination by prodding the professionalism and dynamism of teacher's faith. Eliot calls teacher lyrically "the nomad of

the future" who camps in his mechanised caravan upon the ruins of our ancient edifice.

In the name of life-integration, of socio-psychological adjustments, of progressive liberalism, the class must-not be replaced by the ethos of a workshop because in the class-structure of education we conserve values and maintain links from generatiou to generation. The focal factor and genuine input for revolutionising and revitalising the classroom instruction is the personality and habitual performance of a teacher He alone can be the herald of educational transformation, while being the guardian of its wholesome legacy. Computerised or individualised, education owes its aroma chiefly to the academic community. atmosphere and excellence.

Scientifically accurate and exact examination is a pivot, a nexus which reflects our teaching-learning adequacy, the meaningfulness of our courses of studies, the amount of educational stagnation and waste, and, lastly, the success or failure of educational planning and provis oning. We have to see far enough that the students do not suffer when the examination system itself has failed, or when the examiner himself has strayed owing to personal limitations or circumstantial pressures. To aviod misclassification of students, the examiners' marks can be "scaled" to common standard, though this is not a final answer to the problem of unreliability. Secondly, this operation dilutes standards, and bloats false ego engendered by artificial promotions.

Strengths and Weaknesses of Examination

The advantages of centralised system of examination lie in its uniformity and impartiality, its secrecy, its relative objectivity and impersonality, its greater conformity to the set pattern of paper-setting and marking scheme. It stimulates the surge of competitiveness, and ensures identity of syllabi. It is invested with authority and esteem because of its wider acceptability and respectability for purposes of employment and status in society. But it is also tainted by this chain of criticism ; (a) Its assessment is restricted to the duration of examination. (b) It never takes into serious account the physical, mental and emotional condition of a candidate. (c) It affects students, health due to overwork before and during the examination. (d) It encourages outright cramming, and not critical or organisational faculties. (e) Mass cheating, under duress or complicity, reduces its purposefulness. (f) Rigging of result through leakage of question-papers, their defective construction, and faulty marking render its utility suspect. (g) It cannot possibly cater to the diversity of teaching levels and methods, learning speeds and variety of home backgrounds. (h) It cannot meet the needs and standards of rural and urban children fairly and justifiably, and thus its coverage, suffers because of uneven character and capacity of students. (i) A lot of many failures put the system, its institutional framework, and its practitioners into disrepute. (j) Even random guesswork in objective type tests works out correct sometimes. (k) Continuous, serious study is disfavoured by its very awesome nature. (l) Any sudden change or a clever shift in the pattern of paper-setting without employing corresponding teaching emphasis and corrective steps causes hardship and confusion to candidates. (m) Delays and errors in the compilation and announcement of result

affect adversely admissions into higher courses of study and training. (n) Sudden change or enrichment in syllabi without timely provision of textbooks creates difficulties and frustration.

The present unilinear and predominantly academic character of our education is irrelevant to the work expectations of our society. Hence the revolutionary reform of 10+2 concept in our educational system is on the anvil. Under its influence, block marking with 7-point scale prevails, and it hopes to ease the rigour of percentile futility and the unemployableness of drop-outs.

To my mind, supplanting and scrapping examination is no definitive answer. Instead, it should be remodelled and invigorated by research-based suggestions and commonsense - actuated considerations. Examination-free education will be a nightmare of laissez faire — a holiday from checks and balances; and shall take us quicker to the outcry of Ivan Illich's "De-schooling society" in which the formal centres of learning are discarded, and the informalisation of education is popularised.

Extreme Choices

Edward Thring highlighted the superstition of "the cult of the examiner" which hampers and dictates the flow of teaching, apart from equating education and training with the finality of examination scores. Another extreme alternative suggested is the free progress system under which progress cards are maintained, and students are not sharply divided into grades and categories. But each one is led "to aspire for and climb up the luminuous peak of knowledge, power and delight."

Balanced Compromise

It is my confirmed opinion that instead of following the mirage of "deschooling", we rather insist on the "re-schooling" strategy by incorporating the humanising influence of internal assessment and oral examination into the existing set-up of centralised system of examination. After all, it is basic to the scholastic measurement of students' competencies and the improvement of educational standards. It is the baseline for recruitment into Govt. Service and private sector jobs. Amply buttressed, examination will be viewed as an institutional ally and a weapon for promoting educational growth and excellence. It will rouse the complacency of students adrift, tone up the listlessness of 'typed' teachers, activise the absolescence of curriculum, and ultimately prove false the tribe of Goodmans and Silbermans who decry schools as "grim and joyless" places where "compulsory Mis-education" is worshipped as an "intellectual superstition." Let the doubting Thomases like John Holt who allege that "most of the real education takes place before school, outside school and since school" be countered appropriately by conducting examinations well and wisely. In a wholesome effort, both the examinees and the examiners should co-operatively go ahead by detecting inherent and extraneous faults, and by plugging the loopholes of administrative infrastructure in a self-critical, constructive mood.

General Considerations

The job-oriented education, based on long-term planning and its job-mapping with flexible interspaces between any two levels of education, is truly a democratic system. In it, self-evaluation and self-correction together with automatic feedback sustained by inter-disciplinary and

inter-institutional efforts are vital imperatives. Education and social changes are known to be inter-dependent and mutually inducive. Right from the phase of objectives to the stage of evaluating the entire system, it should be participatory in character to attain a strong, widespread base. When the rhythms of life are fast changing like the social topography, the mobility and versatility of job designing is of paramount importance. The Centralised system of examination, if made scientifically meaningful, technically sound, and sociologically viable, will have no frustrating drop-outs but only diversified by-products. It would make its outputs directly contributive to social development. In this manner, failure-haunted education will cease, senseless stampede into colleges will halt, and malfunctioning of students leading to break in academic life and in personality disturbances will be substantially lowered.

Concluding Remarks

Respecting the concept of life-long education in a dynamically learning society will change the very frame work and associations of failure or success. A person who fails at a given level and age in the course of his educational career will not be relegated for ever to the ghetto of his own failure. He will get opportunities to improve himself when the authentic sway of democracy prevails in educational practice by the cessation of confusion and ambivalence, and by the provision of equal access to education with equal opportunity and equal measure of success. At present, our marking or grading system rewards the strong, the lucky, and the conformist : it blames and penalises the unfortunate, the slow, the ill-adapted, the people who are and who feel different. Even the meritocratic process of selection, though blocking nepotism and favouritism, gives good conscience to achievers while concealing the other side of the problem. It bestows social seniority, and generates another type of elitism. Hierarchic curriculum, authoritorian equation between the teacher and the taught, close society and theoretical education, non-guidance towards self-education and no effective change from being passive objects into active subjects, and the absence of real horizontal and vertical mobility between institutions of all types and at all levels are some of the dead ends, the blind spots of our educational experience. No wonder, some perceptive critics remark that the existing school system is such that it works on behalf, and in fiavour of inherited and acquired power. Its claim is equalitarian or egalitarian, but its function upholds prerogative. It selects its "Prize boys", and forces the children of the underprivileged class to drop out by its sovereign hypocrisy. In the final analysis, to be just educationally and rational sociologically, the essential postulate should be equal educational outcomes, and not merely equal educational inputs. Again this benefit is to apply and accrue to extensive groups and is not to be reserved for patronised individuals. As it is, the weaker sections of the society are the first victims to be denied their right of proper education in poor societies; and are the only ones deprived in the rich, despite our premature protestations and pride about the right of universal education.

Rich Vista

If our examination system tests what is taught, is meant for success attuned to the needs of prospective employers, and takes into account the

By **Shri K. S. Acharlu,**
Academy of Gandhian Studies, Hyderabad 500044 - A. P.

A Two-Hour Rural School for Small Villages

OUR Republic emphasizes that social justice is the foundation of a healthy democracy. The Constitution demands that we create a a society in which people have equal opportunities for getting rid of poverty, disease, hunger and ignorance. Artcle 45 of the Constitution requires that the State should strive to provide free and compulsory education for all children up to the age of 14 years and that this should be achieved before 1960. But in spite of the efforts and 'drives' of State departments of education, the constitutional directive has remained unfulfilled.

The Kothari Education Commission believes that the provision of free and universal education for every child is an educational objective of the highest priority not only on grounds of social justice and democracy, but also for raising the competence of the average worker and for increasing national productivity. (7.08)

Our educational system today both in its objectives and in its programmes falls short of meeting the needs of social justice guaranteed by the Constitution. Education is said to be the 'great equalizer' of human conditions, and it is claimed that poverty would disappear and the discord between the haves and the havenots would be lessened. The socio-political obectives preached by politicians and professors and studied in text-books are found to be empty platitudes in actual practice. Whatever be our pious assertions, our concern till today has mainly been the welfare and economic and educational betterment of the middle and upperclass strata of society in urban culture. Attention has been concentrated on the educational progress and advancement of the metropolitan areas, towns and big villages and scant attention has been paid to the small villages in which breathe the low-income group. Crores of rupees are spent to satisfy the craze for superfine and magnificent institutions equipped with all the modern amenities found in the most economically advanced countries of the West while education for these unfortunates has become not only a remote aspiration but a purposeless proposition. The few children that are drawn or driven to schools from their homes are either withdrawn after a short period of schooling or have become stagnants.

(Continued from preceding page)

progressive targets and techniques of industrial and technological concerns, it will tend to minimise the gap between the knowledge and the living experience of students, between the system of values it preaches and the goals set up by society, between its ancient curricula and the modernity of science. Then learning will develop in and through creative work; and education shall not prepare only for stereotyped functions, stable situations, for a particular trade or a given job; in fact, for a bare solitary moment in existence.

The Kothari Education Commission drew the country's attention to two significant aspects of the problem: the first is that of reduction of wastage and stagnation. The second is that of providing such foundational education as would help children to grow into useful and responsible citizens of the country.

There are many causes for this desperate and difficult problem. But the most disturbing one is the economic condition of lakhs of low-income group families for whom the children of school going age are indispensable factors in domestic economy. It is felt by parents that a whole wakeful day or atleast six to seven hours of precious time are lost to the family. The parents not only cannot afford the expenses for equipping the children for continuous schooling, but they cannot also ignore the income though meagre, derived from the children's employment in various rural occupations are in sharing domestic duties.

Many other reasons have been stated to account for this state of affairs, but the chief one seems to be the absence among the rural poor of a feeling of genuine participation in the educational programme, owing to the realization that the schooling the children receive is unimaginative and irrelevant and not in consonance with their life needs, and does not make the children partners in their life vocations or purposes.

The problem of wastage and dropouts is intimately related to that of the formal, verbal education we are now providing in rural areas. It deals too much with books and is little related with life. For the poor peasant it is an undeserved punishment to be asked to send his child to school for the most part of the day in addition to the possibility of drawing him away from the country to the city. The real challenge for us educationists is to provide the millions of the low-income group in the rural regions the kind of education that will help them and their parents to lead more economically secure lives, learn more and better skills, habits and knowledge to make their lives more functional and to restore direction and purpose to rural education.

The Education Commission realizing the dull charater of most of the schools and their poor quality to attract and retain students suggested qualitative improvement of education which ordinarily implies improved classroom teaching, providing teaching aids, better facilities, effective evaluation, extra-curricular activities and so on. But all these programmes though useful, do not touch the core of the problem. What is needed is a revolution in the educational objectives to create the necessary climate for people's participation.

Almost invariably rural children are entrusted with chores at home or the farm or in the small shop where they have a chance to acquire, by practice and observation, the confidence and skills of adult life. That is how they are prepared by the parents to act as responsible members of the adult community. Our educational system does nothing to encourage and utilize the life vocations at home. What is really happening in spite of protestations to the contrary is the modernization of rural children and rural culture. By campaigning for the education of success, status and material values, educational planners are encouraging the development among rural children of undesirable human values while strangling the essential ones. Have we calculated the economic and

cultural loss to the nation by driving the rural children to urban type schools and waste away their traditional skills, not to speak of the incalculable loss to human dignity by driving the children into folds like sheep and stunt and stifle their natural growth. It is possible to restore the intellectual alertness, creativity and freedom of these children in the places where they live and work by a proper philosophy of education.

One of the suggestions offered by the Education Commission for a solution of the problem is 'part-time education' for the stagnants, to be conducted by the local primary school teachers outside regular hours, utilizing the equipment and building of the same school, without rigidity in matters of time and the time table, adjusting to local conditions so that the school might not interfere with that of the home. The curriculum for these part-time schools suggested by the Commission is not basically different from that followed in the ordinary schools; it is only an abridgement of it. Both these suggestions do not seem to us to go to the roots of the problem. The ends of school justice can be met only by an educational programme whose economic and social objectives are in consonance with the traditional values and skills and the life pattern of the rural masses so as to make their lives healthier, happier and more meaningful.

This paper presents a scheme of 'part-time education' in small villages consistent with the demands of social values and cultural needs of Indian rural life.

1. Priliminary Work :

Before the school is started in any village a quick educational-cum-economic survey of the village (s) has to be made with a view to collecting data on the following :

Number and age of school going children.
How are these children engaged while parents are at work?
What are the hours of employment in these tasks?
What are the places of such employment?
What is the nature of their work?
Are there seasonal variations in work?
What is the expected additional income to the family?
What are the rural occupations in the village?
Number of adolescents who are part literate.
Number of elderly persons who are literate in a broad sense.

A study of this data will reveal the actual pattern of children's work, places of employment, duration of work etc. It may be that the children are engaged in grazing sheep, goats and cattle in pastures and fields, watching crops in fields and gardens, taking care of little ones at home, helping parents in domestic cores, assisting parents in occupational trades and so on.

On the basis of this data it will be possible to identify places where the children are engaged and the time when they will be out of home or remaining idle without employment. The children may thus be grouped according to their availability for atleast a continuous duration of two hours during the day for class instruction by the teacher. It may be assumed that in a small village there may not be more than 15 to 20 children of school going age who will come under this project. These children may be grouped into two shifts of two hours each so that the teacher might offer

not more than about four hours of instruction during the day. It will be useful, desirable and economical to engage these groups outside the village in places where children can conveniently gather, say, under the shade of a banyan tree, near a well, out in the pastures, in an unused mantap in the field or garden and so on.

II. Curriculum:

From the very nature of varied conditions of living from region to region, no uniform packaged Course of studies will be effective. The curriculum should have the life perspective and offer freedom and opportunity for the teacher to think and plan in relation to the natural and social situation and culture of the region.

a). Cleanliness and sanitation:

Cleanliness and sanitation should get top priority. The children must first be taught to clean their teeth, eyes and nose, comb their hair properly, scrub the body at least once a week, and also wash the few clothes they wear. The teacher should have with him a few napkins and pieces of cloth to be used while the children are being taught and trained in bathing and washing. The teacher's kit should invariably contain tooth-powder, washing soap, soapnut powder, a mirror, combs etc. The sanitation of the place of instruction is an important matter. It must first be swept clean, watered and with fine clay and cow-dung. Children should be taught proper places and methods of personal sanitation.

During the first few weeks of the project about an hour may have to be utilized for this important activity. As the new attitudes develop into habits, about 15 minutes every day would be more than adequate.

b) Prayer :

The next item to be attended to is that of prayer, to be conducted in a clean place in a prayerful attitude. The teacher will recite simple hymns and bhajans in the mother tongue to correct music and rhythm. At a later stage a few Sanskrit slokas from the classics and poems from great books in the mother tongue should be taught. About 10 to 15 minutes every day may be required for this purpose.

c) Story telling:

Next comes story telling from our timeless epics like the Ramayana and the Mahabharata and from folk tales. The myths and legends of the local region may also be related. In history the pupils should not be fed with the biographies of mediocres. They should not be taught the politics of hatred. Party politics distrubs the even tenor of their lives whose objective in life is the happiness of all.

d) Observation of the environment :

Observation of and study of the natural environment, the hills, uplands and down lands, streams and sand beds, rocks and soils, vegetation and animal life, the rising and setting sun. Observation of the heaven at night during different seasons of the year and study of constellations, the moon and its phases, the new moon and the full moon and planets, the stories of Dhruva, Sharmista, Vasistha, Rahu, Ketu etc , will provide delightful education. It is possible that t' entire village may join the study a observation, while the elderly pers may have some interesting expe ences to relate.

e) Reading :

The young children will not begin reading lessons till about an year of observation and experience and practice in oral conversation. Later

(Continued on page 233)

By **Shri K. Thiagarajan,**

Hony. Secretary, United Writers' Association, Madras-600004

Fostering Fine Arts Education

THE heritage of Indian Art is a mirror of the thought, religion, philosophy and culture of India. Our Country inspite of the destruction and mutilation wrought by invaders is still rich in the vestiges of the highly cultured life which our ancients lived. It has been found of late that there is a rethinking going on, and the aims and objectives of education have been sought to be reaffirmed. Either education caters to the practical needs pertaining to the material environment or to the demands of our pleasure-seeking propensities. Butler rightly insisted on fine arts education as an integral part of the curriculum.

The necessity of imparting fine arts education stems from the concept of the 'whole man' and 'man-making education.' In the existing curricula, the pupils ears and eyes were neither trained nor initiated into the secrets of these forms of creative activity. Their senses were not trained and as such their passions are not educated. The training and sublimation of the passions is the essence of true education. This training of passions means and presupposes the training of the senses. The senses must be selective and appreciative and for that they need training. Mere negative injuctions and inhibitions will not help us to formulate a sound scheme for the training of the senses. Beauty in art and nature should be made accessible to our senses. The senses should be trained to respond the sensuous appeal thrown up by our environment.

To attend to such appeals and to respond properly, one has got to be endowed with a value-sense, which needs cultivation and culture at different levels. This value-sense is the bed rock on which the edifice of art appreciation in man has to be reared up. Appreciation of arts is no easy task, and philosophers of a particular school have taken appreciation to be a new form of creation. For them, appreciation and creation are identical. To make man responsive to the aesthetic appeal, we should look for an all-round system which provides for the training of the intelligence and of senses as well.

At the Primary Level : Fine arts and crafts may be taken as one subject for the Primary stage. The ever vanishing line of demarcation between Art and Craft makes the problem easier for us. We may introduce compulsory crafts upto class V. All the fine forms of fine arts, viz , Poetry, Painting, Architecture, Sculpture and music may be taught in the Primary classes. With regard to lesson on Architecture, suitable blocks may be used to make the students acquainted with diffierent architectural patterns, both ancient and modern. Grammar of music in elementary form may also be introduced from class VI and may continue upto class VII. Elementary discourses on the Art of Painting may also be introduced concurrently with the Grammar of

music. These elementary lessons on the nature, structure and function of all these forms of fine arts will help the students to understand the nature of the specific problems as involved in the particular branch. At the primary stage i e, upto class V, we shall lay stress on practice. The students should learn to draw, to paint, to sing and to do sculptural models. Lessons on rhyme would help them build up a poetry-sense. That is already included in our syllabus of studies. All that we need in this stage is to select different varieties of poems illustrating the different rhyme-patterns for introduction in the lower classes of the school, to the different intrinsic appeals of the varying rhyme patterns.

At the higher secondary stage : At the higher secondary stage, fine arts could be offered as one of the optional subjects. The syllabus will include discourses, both historical and analytic, on all the five branches, with provision for practical work. Students' practical skill may be tested in one of the branches of fine arts and appropriate credit given at the higher secondary stage. After completing the higher secondary course, students intending to be painters, sculptors or musicians should join the School of Painting, Sculptor or Music, the as the case may be. In order to implement this new pattern of fine arts education proposals, we must establish a network of Schools of Music, Painting, Sculpture and Architecture throughout the country. Such schools will train and man the specialists of the future and the artists of tomorrow. These schools will aim at boosting creative activity, and we will have the future generations of artists trained in these schools. The syllabi for crafts schools to be established in the country should be suitably amended to give the craftsmen a theoretical background of the trade they are expected to practise.

As for students going in for general education, there should be provision for 'area fine arts gallery', where models and miniatures of classical fine arts are to be preserved. The students belonging to the area should visit these galleries atleast once in every month. Latest specimens or innovations in the field of dffierent branches of fine arts should be displayed there. Lecturers would be expected to lecture wtth charts, models and illustrations on the different aspects of fine arts development in the country and elsewhere.

At the collegiate level, fine arts or aesthetics may be offered as one of the subjects of study. Students at this level may be given the option of practical test. Students not going in for practical test may be allowed to take up some other theoretical paper on aesthetics. For students of aesthetics and fine arts, ample provision should be made for giving them access to the classical works on the different branches of fine arts. They shoud also be made acquainted with the library of musical records, photographs of classical painting, architecture and sculpture and galleries of architecture and sculptural models.

At the post-graduate level, a historical development of the different schools of art should be incorporated in the syllabus. A survey of Indian aesthetics in general should also from a part of the syllabus. A study of Indian religions would be necessary for a proper appreciation of some forms of temple sculpture, architecture, music and dancing. The advanced students at the post-graduate levels would be expected to

(Continued on Third Cover)

Introduction of the New Pattern of Education and its Justification

SOME one has said, "If you are planning for one year, plant grain; if you are planning for ten years, plant trees; and if you are planning for hundred years; plant men." Undoubtedly the progress of any country depends on the efficiency of its man power and education is the only powerful means which prepares men and plans for the long term development of a nation. Unfortunately the existing system of education is largely unrelated to the life, needs and aspirations of the people and there is a wide gulf between its contents and purposes as well as interests of national development.

IN order to link education with productivity which is the need of today and to improve the quality of education, the Indian Education Commission (1964-66) recommended educational reconstruction by introducing a broadly uniform pattern of 10+2+3 throughout the country and re-organizing curricula at all stages of education. The Commission points out that one of the major weaknesses of the present educational system is that secondary education fits students for college and almost unfits them for everything else. In any well designed national system of education secondary education must have two specific objectives - to prepare a student for the University or to become terminal and prepare a student for some vocation in life. Also realizing that the total period of education and the duration of its different stages have a direct bearing on the quality of education, the commission recommended extension in the total period of schooling to bring about a general rise in the standards of attainment and vocationalization of education.

ACCEPTING the recommendations of the commission, the Government of India issued a National Policy Statement on education in 1968 in which it stated- "a radical reconstruction of education on the broad lines, recommended by the Education Commission, is essential for economic and cultural development of the country, for national integration and for realizing the ideal of a socialistic pattern of society. This will involve a transformation of the system to relate it more closely to the life of the people, a continuous effort to expand educational opportunity, a sustained and intensive endeavour to raise the quality of education at all stages and emphasis on the development

of science and technology and cultivation of moral and social values." The Policy statement also stated that it would be advantageous to have a broadly uniform educational structure in all parts of the country.

ACCORDINGLY the new pattern of education—10+2+3 is being introduced throughout the country. It is accepted on sound academic considerations. Uptill now there were at least four different pattern of schools and colleges prevalent in the country. For example Kerala & A. P. had the pattern of 10+2+3, the two year stage being located in Junior Colleges; Uttar Pradesh had the pattern of 10+2+2 i. e. a tenyear school followed by a two year Intermediate course and a two year course for the first degree; Delhi Union Territory and the state of Madhya Pradesh had 11+3 pattern i. e. an eleven year Higher Secondary School course followed by a three years course for the first degree and the pattern of 10+1+3 was followed in other states where a school stage was followed by a year of pre-university course and a three year course for the first degree.

ANY concept of a national system of education presupposes a broad similarity of the pattern. It helps in strengthening the unity and solidarity of the nation. Besides, on academic considerations too, it is highly desirable to adopt the uniform pattern of 10+2+3 in all the schools and colleges of the country. Uptill now the course of secondary education being continuous and unbroken, the students had no option to leave it to the middle. Also the students were required to make choice of their courses and future career in class IX only i. e. at the premature age of 13 or 14 years. In the new pattern the secondary stage is broken in two parts. Upto class X there will be one stage where all the students will receive general education. The subjects to be taught will include three languages, Mathematics, Physical Sciences, Social Sciences, Work experience, Art Education and Health and Physical Education. These will provide a wide range of knowledge to develop students into well informed citizens and train them for democratic living and community service: at the same time to imbibe a scientific outlook for modern living. This will be a stage terminal for some of the students who may leave the school and enter life

IN the next higher secondary stage of two years, there will be two distinct streams—one stream preparing the students for admission to universities and the other preparing them for different vocational courses. At this stage the students will be mature enough to make proper choice of courses and to take decision about their future career! Here only the gifted students will be prepared intensively for the university and the rest being diverted to different courses of vocational education; the pressure on university admissions will be much reduced.

Thus, addition of one year to the school stage and inclusion of intermediate course within it, will not only raise the standard of education at the school stage but will also help to improve the standards in higher education.

BESIDES the above structural changes, one of the important features of the new pattern of education is the work experience to be given to the students through out the school stage. Under the existing system, there is a wide gulf between the world of school and the world of work: with the result the students, turned out by the education system, fail to become productive units in the society. The major aim before the education, therefore, is to bridge the gulf between the school and the world of work. Work experience in the new pattern of education, is a step in this direction. Also as our country is making a head way into the industrial and technological revolution, we would not only require highly skilled artisans and technicians: but would also require average citizens to be self-supporting and self generating in their competence and attitude. Work experience will equip every citizen with knowledge, skill and attitude necessary to make him a productive and creative worker in society.

TAKING a broad view of work experience, productive work has been defined by the Education Commission, "as participation of pupils in productive work either in school, in home, in workshop, in farm, in factory or in any other productive situation." Thus, the experience to be provided need not be confined only to a factory or a farm rigidly; but it can also include experience having relevance to school and home. The ultimate objective of the whole programme of work experience is to expose students to various fields of work in order to help them discover their aptitudes and capabilities, to enage them in production process to make them self supporting in life, to orient their mind for scientific and technological outlook and to encourage original creativity in them. With this end in view wide range of work experience is being provided in the curriculum which relates to areas like science and technology, agriculture, handicrafts, fine arts and household activities.

ANOTHER important feature of the new pattern of education is the reform in the examination system. Under the existing system the result is declared on a 101 point scale of marking. The marks obtained by a candidate in different subjects having on parity, as some may be high scoring and others less scoring, are totalled up and the result worked out on the basis of the agrgegate. A candidate getting 60% aggregate marks is regarded as superior to a cadidate getting 59.9% marks irrespective of the nature of the subjects offered. All this causes a considerable measure of frustration among students.

THE radical change brought about in the new system is the introduction of grades instead of marks. Now the students will be given five grades; Grade 1: Outstanding, Grade 2: Very good, Grade 3: Good, Grade 4: Fair, Grade 5: Poor on the basis of scientific evaluation. Instead of totalling up the marks of different subjects, the grades will be awarded subject wise and if any student wants to improve his grade in any subject, he will be allowed to do so. Thus, a student will not be declared as 'fail' if he has partially succeeded in his educational effort. Under the new pattern, the examination will form a part of the educational process as its results will be utilized to provide remedial teaching for weak students and to bring about improvement in the teaching methods.

ABOVE all the new pattern provides education for modernisation. The content of courses in the new curricula is forward looking. Important developments in different areas of the subjects have been incorporated and the dead wood has been eliminated for modernisation. Stress has been laid on recent scientific, technological, social and economic developments in various subject areas. Besides the changes on the national scene, developments in other parts of the world too are brought in lime-light in order to broaden the outlook of students. For the full development of the physical, emotional and other aspects of the pupils' personality, provision has been made for health and physical education, community service and other activities in the new system of education.

THUS, the new pattern of education is really a revolutionary step in the direction of national development, of course, its success will depend on the proper execution of the plan which is a long term co-operative venture requiring sincere and honest efforts on the part of teachers, students, guardians, members of the society and the administrators. For example the teachers will have to deviate from their old, out of date traditional methods of teaching, the students will have to realize the dignity of labour, parents and guardians will have to support and co-operate with the new reforms, the society will have to change its outlook giving high status to the skilled workmen rather than to the diploma or degree holders. If we could do all this, the new system is bound to take us to the summit of our national development

— *'Shams'*

(Continued from page 226)

the lessons will be in the form of charts specially prepared by teacher using the vocabulary familiar to these children. A series of lesson charts will thus form their reading book. Reading practice will be provided through repeated learning of the words and sentences used in the charts. In the first stage no attempt should be made to teach writing. A few good poems from classical literature should be selected to be learnt by heart. For the older children who have been taught reading the printed book may be used Specially prepared reading books may be given to pupils to be carried with them in their satchels to the fields and pastures. It would be delightful experience for the children to sing and recite poems loudly while at their work. It is within everybody's experience that today children sing bawdy cinema songs in the fields and farms during work. It should be obvious that the text books designed for urban schools in which great stress is laid on consumer culture are hardly suited for the simple, inglorious lives of these rural folk. At the advanced stage children should be helped to peep into the riches of great classics of the ancients to obtain visions of excellence.

f) Number:

In the earlier stages the sense of number should be taught orally through pratical experience and observation, e. g. while counting sheep and goats, trees, plants, flowers, fruit, pebbles, distant objects etc. The multiplication tables should be taught through oral drill. In the advanced classes oral and written work may be done. The boys may carry their slates with them wherever they go. The sums taught should be from real life, e. g. field measurements weighing fruit and vegetables and calculating cost, profit and loss estimates, village shop and sale of articles, cost of fuel, kerosine and so on. Practice cards may also be prepared for drill.

g) Simple Science:

Observation of nature should be the foundation of science. Talks and discussions may be held on water and its use, air, pure and impure, breathing, light, heat its uses and misuse, food, what to eat and why, common bodily ailments and preventive measures. It will be possible to conduct simple experiments with domestic utensils and fire. Even adults of the village may observe the experiments and gain valuable scientific knowledge. Careful observation day to day of plants, animals and insects will acquaint the pupils with a fund of biological knowledge. There is a natural bond of friendship between man and nature in the countryside. It is a sort of reverence, a spiritual relationship. Once this relationship is destroyed through an education for power and profit it will be difficult to return to the bosom of nature. The Indian villager is a cultural literate. Modernization is trying its level best to make him an illiterate.

h) Art:

Children who are bound to life in the lap of nature should be allowed to develop their aesthetic sense in poetry, dance and drama. The country side is always beautiful. Everything in nature, flower, leaf, tree, insect is a lesson in art (and mathematics). It is this indissoluble relationship between man and nature that created immortal poetry. Why do we dragthese children of nature into the dreary sepulchres of the cities?

The village children may be given opportunities to dance, draw, and, paint and play. There is no need

to have seperate periods for this purpose. A whole day may perhaps be devoted to it. Art is not to be identified with drawing paper, colours and brushes. The children may be encouraged to build beautiful patterns on the floor with different kinds of coloured soils and flowers and leaves Vegetable hues can be obtained from leaves and flowers of different kinds of plants. Artistic work for the panels of houses after they are white washed offers excellent opportunity for beautification and expression of originality. Decorating houses and shrines on festive and religious days is an occasion for artistic creativity.

i) Games:

Indigenous games may be taught in the evenings not only to the children but also to the young men and women of the village. Folk dances and other group activities on moonlit nights are a glorious opportunity for community participation.

j) Crafts:

It is not proposed that the children should learn a craft or two separately since life in the community is itself a craft and provides the natural medium for education. The teacher will get familiar with the local occupations of the people and make use of that experience in the education of the children. It will however be useful if the children are introduced to spinning on the takli and the charka. The former may be carried by them, to the fields and pastures and plied whenever they feel free. The transition from the takli to the charka and later to the Ambar charka becomes natural and excessively profitable.

K) Distribution of time:

About twelve hours a week may conveniently be distributed among the several subjects of the curriculum. But there is no need to adhere strictly to a rigid time table. The available time should be distributed among—Sanitation and health, prayer, language, stories, arithmetic, science and social studies.

III. Equipment:

Every child should be provided with a satchel to carry with him wherever he goes, a takli and slivers, a slate and slate pencil, a reading book, a napkin and a piece of soap, The teacher should equip the place of instruction with safai articles, a mirror, tooth powder, combs and napkins, soap and oil, a few pieces of clean clothing, reading charts, maps, sets of pictures pasted on card board, rolling blackboard, a few nails, mats etc. The beautiful posters and pictures published and distributed by the Information department to tourists may well be obtained free of cost.

IV. Teacher:

The teacher should be a person who lives in the village and is a respected member of the community. He should be a person of normal health, appointed for his zeal and interest in the welfare of the village and children. Cleanliness in person and willingness to serve are the most important qualifications. Academic qualifications are not unwelcome but should not be insisted upon. Persons of advanced age possessing sound health and character should be preferred to a younger person, inexperienced and uncertain. The teacher's wife, or any other young lady of the village may be offered a short on-the-job training for running a balavadi. The teacher must be trained in a special institution not continuously for an year or two as is usually done but in an on-the-job course, split up

into short periods of experience in the school alternating with discussion in the training institution.

V. **Teacher Training:**

The curriculum for teacher training should consist of acquiring knowledge and skills in spinning on the takli and charka; the study of rural India and rural life; the acquaintance of folk tales and songs; singing bhajans and poetry set to music; simple science of everyday things and methods of observation; and experiment with simple domestic equipment; the history of the place and the country; life of people of different regions, and some ideas of Gandhi's concept of Grama Rajya. The Methodology will consist of general principles of curriculum construction, and practical lessons on and how to tell stories; how to recite musically; preparation of reading charts and lessons; how to conduct reading lessons; psychology of teaching number to children; how to prepare arithmetic lessons based on experience; how to teach tables; how to conduct arithmetical tests; how to observe nature and frame talks on observations; how to prepare simple drugs and decoctions from local plants and roots; how to collect stones, rocks, soils, roots etc; how to establish a small village museum; study of civic institutions of the village; how to develop the artistic talents of children; how to conduct simple games and physical exercises; how to organise functional social education for adults.

An extremely important work for the teacher will be social education — understanding the peoples problems, discussing with them laying priorities for attack; seeking the cooperation of the villagers for solution of their problems, channeling the energies of youth for developmental work, athletics, conducting talks on civic and social problems, land utilisation, sanitation and health, improving their occupational skill by using better techniques, better organic methods of agriculture etc. The school teacher becomes the centre of a variety of community activity to improve the life of the people.

Acharya Vinoba's "EK-ghanta patashala" concept offers an ideal which would serve as an inspiration for further experimentation in this direction. The educational process outlined above attempts to apply his concept of Nai Talim in a setting of modern schooling. It makes education functional and living instead of its degenerating into lifeless technique. It prepares the young of the village for a full and satisfying life as members of the family, as workers in the community and as integrated and purposeful human being. The children are taught no fragments of knowledge but are encouraged to bring together all their experience; at home and outside into an integral unity. What are learnt are not isolated subjects in the time table and the text book but organized meaningful experiences. Education thus becomes a function of the entire society. It is the community and culture that educates the child. Life constitutes compulsory education.

Readers' Forum

MULTIFARIOUS TASK OF A TEACHER

Sir.

Teachers are the architects of the Nation. They are the real nation-builders. They are the makers of men and ministers. Their services to the country are much more valuable than the men at the helm of affairs. They deserve all respect and consideration at the hands of the Government who must make them live in happiness and contentment Their task is multifarious, The Director of School Education of Tamil Nadu Government has issued a statement on the Teachers' Day in the most inimitable manner.

1, "He has to prepare for teaching with aids, charts and models. He has to hold weekly tests, monthly tests, internal and external examinations.

2. He has to be a second parent. He has to guide the young, discipline them and shape their destiny. He has to be their "Dictionary and Encyclopaedia."

3. He has to be a model for the young with the strictness of a teacher and affection of a parent. He must be of an exemplary character.

4. His "Family Life" is an example of his being good and smooth.

5. His work is supervised by the headmaster. He has to maintain attendance register. His work is subject to the scrutiny of both by the students and the headmaster.

6. He has to teach in the class room and take the students on long excursions. He has to organise school meetings, staff meetings and publish school magazines.

7. He is responsible for school results and answerable to the headmaster and management in case of large percentage of failure.

8. The Director graphically mentions that his responsibilites do not end here. He is catalystic agent for drawing out charity for school improvement schemes, midday meals, book banks and school uniforms. He has to promote small savings, family plannig, International understanding, literary schemes, village health and sanitation and community development schemes. He is a village leader by his own right and sometimes, village doctor and astrologer also. What odd jobs a teacher is destined to do in creating and training the young to be good, useful and responsible citizens of tomorrow. To them, a teacher is a friend, philosopher and a guide.

It is indeed deplorable that they should be treated like ordinary beings without any compunction at the hands of government. Several commissions and committees have been set up but all their recommendations are in the cold storage with no distinct advantage to them. The Association of University Teachers is one classic example for the step-motherly treatment by the Government. It must be realised that the teacher lays the true foundation for the future of our country. The Ballot Box is next to this. They deserve the top priority of attention, respect, reverence, recognition, honour and homage."

"Blessed is he who is a teacher; twice blessed is he who is a born teacher in this great land of ours where the preceptor has been loved, honoured and lifted to the ranks of Gods where prince and peasant have vied with each other in showing him respect." Said Kulapathi Sri. S. Balakrishna Joshi, Teacher of Teachers.

— R. S. V. RAO.

Do We Learn How to See?

By MIRANDA ROBERTSON

Does it matter whether one learns to see or sees to learn? It might not seem so, but the difficulties people who lose their sight early in life and have it restored latter sometimes encounter in co-ordinating movement and eye suggest important clinical relevance for this philosophical and psychological problem. Experimenters at Edinburgh and Cambridge nave now shown that much of seeing is learnt and that vision impairment in infancy may permanently cripple the brain to some degree.

For man, the sense of sight probably provides more information than all the rest of the senses put together. In fact, man's visual world is so complex that psychologists have felt for a long time that human babies must have to learn to see. It seemed reasonable to suppose that for visual images to have any meaning, they must be associated with information from the sense of touch; and this association would presumably have to be learned.

This supposition seemed to be borne out by the earliest attempt to put it to the test, when the German philosopher, Von Senden, made a series of observations on people who had undergone operations for cataract. These were all people who had lost their sight early in life and had it restored by surgery much later. Von Senden discovered that these patients found it horribly difficult to use the sense of sight which the surgeons had triumphantly restored to them. This seemed to him to show that visual perception is not innate but has to be learned. However, recent observations on human babies have shown that some ability to perceive is probably innate, and experiments with kittens reared in peculiar visual circumstances suggest that Von Senden's cases had problems that went deeper than those of having to learn a lot rather late in life. It now seems that abnormal visual experience very early in life can permanently affect the brain.

As far as associating touch with vision is concerned, newborn human babies lead a very sheltered life. Certainly few human babies under the age of two weeks are accustomed to being hit in the face by large objects approaching at speed. Yet Dr T. G. R. Bower, in the course of a series of studies at the University of Edinburgh on very young babies, has found that two-week-old babies react to approaching objects quite violently. In his experiments, well-fed babies were strapped into a comfortable seat and watched for their response to the approach of a large object. All the babies raised their hands defensively, most cried, and some were so upset that the experiment had to be stopped. To check that changes in air pressure created by the object were not the source of the reaction, Dr Bower substituted an illusory object made with a shadow-caster. The babies still responded in exactly the same way. On the other hand, they were not in the least distressed by a change in air pressure in the absence of a visible approaching object. Dr Bower reasons that recognition by sight of an approaching object must be inborn.

In a different set of experiments, Dr. Bower found that although very young babies are not capable of properly directed reaching movements towards objects, they already know that if their hand coincides with an object in space, they ought to be able to feel it. Tiny babies in a specially designed apparatus

would happily grasp a small object if their hand contacted it. But if an illusory object was presented to the baby by means of some special equipment, and the waving hand encountered nothing where the object appeared to be, the baby started to cry. Dr. Bower does not believe that a week or two of normal life is enough for a baby to have learned to expect to be able to feel what it sees: this eye-hand correlation, in his view, must be innate.

But if a sense of the solidity of seen objects is innate it is hard to see why the people studied by Von Senden found that they bumped into things. Unless, of course, the normal development even of unlearned aspects of visual perception depends on exposure of the eye to the visual world. That this is the case has now been demonstrated by Dr Colin Blakemore and Dr Grahame Cooper at Cambridge in a very subtle way. They experimented with cats whose visual system is quite advanced though not as highly developed as man's But one important point about cats is that a great deal of earlier work had gone into finding out what the messages from their eyes looked like once they arrived in the visual area of the brain. This was achieved by actually recording the electrical responses of the "vision" brain cells, with micro-electrodes while the cat's eye was presented with images of different types. It emerged from these studies that many of the brain cells reacted to lines of various widths, but only if the lines were in a particular orientation—vertical, horizontal or diagonal. Possibly more complex images are built up in the brain using the line responses of these cells as the building blocks.

At any rate, what Blakemore and Cooper tested was the effect of allowing kittens to see lines of only one orientation. They therefore took two kittens and confined one of them to a world containing only horizontal stripes and the other to a world of vertical stripes. The kittens each spent five hours a day in their strange visual worlds and the rest of the time in total darkness. This went on for five months, after which the kittens were brought into the real world for testing. The effect of this regime on the kitten's behaviour was dramatic, and can be summed up by the results of one test. Blakemore and Cooper presented the kittens with a pole to play with. When the pole was held horizontally, the kitten reared in horizontal stripes ran forward to pat it, and the kitten reared in vertical stripes ignored it. When it was held vertically, the kitten reared in horizontal stripes behaved as though it had disappeared and the kitten reared in vertical stripes woke up and pounced at it Other observations on the kittens' behaviour reinforced the impression that the animals were effectively blind to lines oriented at right angles to those which they had experienced.

Blakemore and Cooper were able to extend these observations by recording from the brain cells of the two kittens. It turned out, as they had suspected, that the vision brain cells themselves did not respond to lines in the orientation at right angles to those in which the kitten had been reared. This implies that the abnormal behaviour of the kittens was due not to a failure to learn the meaning of horizontal (or vertical) stripes, but to a failure in the development of the visual system. This of course is much more serious because it cannot be reversed.

Stimulated by the findings on kittens, researchers in Canada have recently brought to light a very interesting and apparently comparable effect in humans. Because of irregularities in the curvature of the eyeball (astigmatism), some people do not see as sharply in some planes as in others. The Canadian workers identified two groups of astigmatics: one had blurring in the vertical plane and one had blurring in the horizontal plane.

All of them wore lenses which compensated for their defect. But in spite of the correcting lenses, when their acuity was tested for lines of different orientations, they were found to see less clearly those lines which would have been affected by uncorrected astigmatism. Since astigmatism is not usually noticed unt;

long after babyhood, it may be that the persistent blurring was due to the failure of the brain cells to develop properly in babyhood, when they were being fed by defective signals from the eyes.

Although, therefore, it is not possible to say that perception is entirely innate or entirely learned, it turns out that thei nteraction between innate factors and experience has important clinical implications. — Courtesy " Spectrum 2729/2"

The Laboratory Environment

By MARTIN SHERWOOD

Much brilliant science has been done under poor laboratory conditions, but, there is no reason to suppose that bad conditions promote good science. Since the life of a science building generally exceeds the working life of those who use it, it has seemed right to the British Government's Department of Education and Science to look into laboratory design and analyse the use to which these spaces are put. The results of this enquiry show that bench space can produce a territorial clash, that laboratory 'territories' swiftly turn into mazes and that the fixed bench is the major stumbling block The Unit has designed a ' flexible laboratory ' to meet these problems and this and the enquiry are described.

Most practising scientists are familiar with the laboratory—yet, untrue to the proverb, this familiarity rarely breeds contempt. Usually it breeds only acceptance. Remembering the days when great science was done with the help of string and sealing wax, scientists are prepared to their tasks. In 1967, the British Government's Department of Education and Science, in conjunction with Universities Grants Commitee, decided to alter this by setting up a Laboratories Investigation Unit to take a scientific look at laboratories.

During the past four years, the Unit—a team mainly of architects—has looked at the ways in which laboratories are used from a number of angles, and their conclusions are not complimentary to scientists. According to one of the team, Frank Drake, the last major change in the concepts of laboratory design was the introduction of piped services. Installations for gas, electricity and water made design dependent largely on the fixed linear bench ; this concept has ossified so that what was basically a technical solution now imposes on the method of working.

The life span of a building generally exceeds the working life of those who use it. A scientist may be required to state specifications for a laboratory in which he will work only a few years before retiring or moving to another job. Yet the LIU team found that scientists involved in laboratory design gave little thought to the requirements of the people likely to succeed them—or even to the ways in which their own research needs might change.

Since scientists are the best people to know the basic unpredictability of research, it seems logical that they would always design labs to be as flexible as possible. In fact, the reverse happens. When the team talked to professors and heads of laboratories about design, they could get no pattern of responses—each person interviewed was interested only in a personal solution. So the team applied some scientific method to the problem. They taperecorded unstructured interviews with the scientists, then analysed the recordings for frequency of use and stress on key words, which enabled them to produce a statistical rating of desirable laboratory features. To this work they added a literature review of anthropometric and ergonomic data—picking up work done, for example at Cornell University on the way in which people wash up is related to sink height and tap placement. Historical series of photograpps were gathered to show how the interior of a lab changed

with time. And finally, the team subjected a variety of laboratories to : territorial analysis seeing who used which parts, where they overlapped, and what the consequences were.

As with many pieces of social research, once started, the conclusions seem obvious. Laboratories are designed primarily as places to do experimental work, frequently from a standing position. Yet, as the LIU found, the sociology of laboratories is more complex : people live in them. In addition to experimenting, they write, think and talk to one another—activities treated as of secondary importance, if not totally neglected, in most laboratory designs.

Much of the storage space in a typical laboratory is under the bench. This can mean a territorial clash, for example, when someone wants a piece of equipment stored under a bench at which another person is working. Or it may mean, since underbench storage is also ergonomically undesirable, that large quantities of apparatus are placed on benches, thus obscuring working space, or, in the case of heavier items, on the floor.

The team also found that scientists hoard. They tend, when they get new apparatus, still to keep the old, thus making the "territory" into a maze. This can mean that laboratory safety standards fall. The permanent laboratory fixture—such as an immovable bench—is also a safety hazard in its own right. Spillages of toxic substances such as mercury may be impossible to clear up thoroughly ; or harmful organisms, for example, may escape from controlled environments to inaccessible parts of the laboratory.

The purpose of the Laboratories Investigation Unit is not just to criticise. It was established in response to requests from several in Britain departments. In particular, concern was expressed about the escalating costs of new laboratories. So, once it had its findings, the Unit had to act on them—by producing an economical alternative to the conventional laboratory. In conjunction with a company situated just outside London (Sintacel Ltd.) it has now produced a range of laboratory fittings on a modular system which mean that labs can be redesigned internally in a few hours without skilled labour.

The key concept in the Scope range, as it is called, is the dissociation of piped services from the bench. In factories, electricity supply often comes from overhead busbars. In the Scope range, this idea is extended, so that gas, water and electricity are all piped into rooms through overhead beams with a number of tap-off points to which flexible piping can be attached to bring the services to bench level. All benches are movable, designed in a number of heights, and fitted with attachment points for sinks and gas / electricity bollards. Sinks drain into movable troughs attached, again by flexible piping, to floor drainage points, which can he sealed off when not in use Partitions can be used to build individual rooms within a laboratory area, for use as offices, store-rooms or darkrooms.

Because of the ease of mobility of the benches and the accompanying storage units, a laboratory can be converted from teaching to research just by altering the fittings. There is no need for the increasingly expensive operations of replumbing and rewiring.

The range is already in use in a secondary school in Manchester and interest has been shown by the Medical Research Council and some of the regional hospital boards in England and Wales, as well as by other educational establishments. Clearly, a flexible laboratory system shows promise to those used to immobile laboratory fittings to which the scientist has to adapt. But then, when the first piped-services laboratories with their fixed benches came in, they must have delighted the scientists of the day. After their lengthy study of the traditional laboratory, the L I U is aware of the problems of ossification. The Scope system, says Frank Drake, is evolutionary. "Already, we are improving it, for example with new types of boom. We don't want to end up with another dogma." — Courtesy " Spectrum 1625/2"

(Continued from page 228)

know something of the ancient occidental art, specially the Greco-Roman art traditions. A survey of the Egyptian, Japanese and Chinese art traditions is also recommended for the advanced students. The aesthetic theories underlying these different art movements in different countries at different periods of history should be studied at the post-graduate level. These studies will make it clear how the contemporary art movement greatly influenced the contemporary aesthetic ideals.

This meaningful reorientation of fine arts education would need quite a large number of competent teachers of fine arts. We must establish quite a number of central institutes for training such teachers. These teachers will be expected to know something of psychology, history and aesthetics. They may be given specialised training in the heritage of Indian art here and abroad. Teachers from other countries should be invited to India and a scheme for the deputation of young Indian teachers for study abroad should be worked out as a part of a teacher-exchange programme. The services of career masters and cumulative record-keepers may be utilized in order to ascertain the competence and aptitude of pupils who would become craftsmen and of pupils who would join the different schools of music, painting, architecture or sculpture. What is intended by this is to make the man develop in all his aspects. Ears are not meant merely for ordinary hearing, nor eyes for merely ordinary seeing. The inner meaning and significance of a thing seen or a sound heard are to be understood with the help of training and education.

Right from the primary level to the post graduate level, students should pay occasional visits to the musem and art galleries, and submit reports of such visits with a critical appreciation, Attendance at music conferences, art exhibitions, extension lectures on art and aesthetics should be considered as co-curricular activities. Excursions to the temples and monuments which are considered to be exquisite specimens of architecture and which contain wonderful pieces of painting and sculpture should be encouraged. The services of radio, television and other allied accessories should be properly utilized to generate a comprehensive art-sense in the students. Refresher courses should be introduced specially for the craftsmen. They should be acquainted with the latest technique and know-how of their respective trades. Artists should occasionally meet at seminars and exhibitions to exchange ideas and they should arrange for 'mixed' exhibition. A fine arts student would profit much by these 'mixed exhibitions' and by the close scrutiny of the works of arts of his counterpart, he would learn that aesthetic creations were not only inspired from within, but also from without. This will give them a correct idea of the genesis of art-creations.

——

Printed and Published by M. V. Subba Rao, B. A., B. L., Managing Editor at the Hindu Press Machilipatnam. Hon. Editor 'Padma Bhushan' Prof. M. Venkatarangaiya, M.A., D. Litt.

EDUCATIONAL INDIA

Vol. XLIII
No. 11,&12

May & June, 1977

★

The race is not to the swift, nor the battle to the strong, neither yet bread to the wise, nor yet riches to men of understanding, nor yet favour to men of skill; but time and chance happeneth them all.

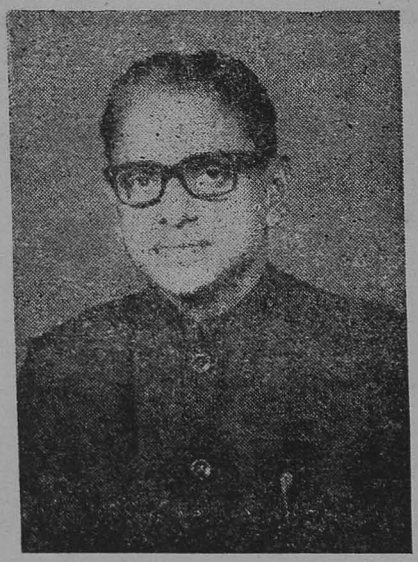
Ecclesiastes 9, 11.

★

EDITORIALS

Recipient of the National Awards

SHRI C. V. SITARAMAYYA, B. A., B. SC., B. ED., presently Headmaster, Tanuku Parishad High School, W. G. Dt., A. P. was born in the year 1929. He hails from Chivatam, Tanuku Taluk. He was the student upto SSLC in the same School of which he heads now. After his B. A., B. SC., B. ED., he worked for 11 years as a Teacher handling Maths.



Shri C. V. Sitaramayya, B.A., B.SC. B. ED, *Headmaster, P. H. School, Tanuku (A. P.)*

Science and English subjects. Later he became the Headmaster of *Iragavaram* High School and served there for 2 years. This brief span of service reflected his mettle—and Iragavaram High School soon rose to prominence under his stewardship. *Undrajavaram High School* was his next assignment for a period of 6 years. In West Godavary District—now this is one of the foremost Schools. In 1971 he was transferred to Tanuku High School—which assignment was given to him by dint of his selfless services. TANUKU High School is now best administered under his paternal care. His words are his wands, and the discipline in the School is quite spontaneous reflecting his personality.

He was an active participant in number of Seminars and Workshops in Mathematics and Science. He heads the District Headmasters' Association as its President. He is the Secretary for the District Common Examination Board.

Whereever he worked, he felt it his foremost duty to improve the Institution in every respect—in discipline, in its tone and in all its requirements to make it a full blown School. Through Cultural, Educational, and Sporting activities he strove hard to develop the innate and latent faculties of the pupils for the development of their alround personality. There is no educational activity or Educational Innovation which he has not touched—be it Science Fair, Inter School Sports, NCC., Book Banks etc. He implemented in his School the 12 Point Educational Programme in its true letter and spirit. He was awarded as a Best Teacher in the District in 1975 which paved him the way to be the recipient of the National Award as a Best Teacher. We wish him a still glorious record of service as an Ideal Teacher.

—

Vol. 43 : No. 11 & 12 May & June 1977

EDUCATIONAL INDIA

By **Prof. Uday Shankar**

Prof. of Education, H. N. C. University, Kurukshetra

Evaluation in Education

THE process of education, at any level is to modify or change the individual so that from a raw material, as he comes to the world, he becomes, as much a finished product, as possible under the conditions of his education and is able to find his way in the long walk of life in the specific society or community, he is required to live in. This process is like planning, designing and building of an engine with the raw material required and available for the specific purpose. While designing or building an engine we do not think to start with, how to inspect it or to evaluate its working or efficiency; we first design and build it and then bother about it evaluation or inspection later. In a similar manner we in education should first plan and help in building the personality of the individual and then try to assess or evaluate how far he has been fashioned for his role in society. Evaluation is, no doubt, essential as even a cook tastes the curry or sees the rice, by picking a grain from the pot, whether it is cooked or not. But evaluation is secondary or ancilliary and not primary; the primary task is to start modifying or educating the individual, just as the cook must start doing the cooking first.

In education, therefore, the system of evaluation or examination should be for and in accordance with the objectives and system of education. We in this country (as is said by some authority), did not have a system of education, and have had only a system of examination. Whatever system of bookish education for instruction and literacy as required and introduced by the British, for turning out clerical hands to help in the administration of the British rule, there existed it fitted with the system of evaluation by external examination which only tested the attainments in the three R's or at best in attainment in reading, writing and conversing in the English language with of course, some acquirement, here and there, in English literature, Western Sciences and other fields of academic learning concerning solely with the mental or intellectual powers or the brain of the individual in almost total disregard or neglect as other aspects of his personality or his other capacities and abilities, physical, emotional, social or moral.

It is tyrannical indeed to judge the value of an individual or his personality from the marks he gets in the external examination which marks hardly have 10% or even less confidence, and particularly when chances are not provided and efforts are not made to develop those spects