THE MEANING AND SIGNIFICANCE OF ADHYATMA FOR EDUCATION

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ABSTRACT : The deficiency of our present education in moulding the future generation to develop a social and natural outlook is discussed in this paper. Also the author highlights here the significance Adhyatma forms of teaching and cultural evolution takes place to that effect.

Introduction

The challenge posed to our education system is now news in a big way. The Government Document (1985) presents it mainly in terms of number of illiterates and quantifiable statistical resources. These numerical facts however are only one aspect of education and not even that important aspect for moulding our national character. The real challenge as I see is of the quality of current education to deal with the crisis of values. The problem is likely to increase in intensity under the present economic policy in which consumerism and inflation are the order of the day and there is increasing tendency to imitate and import in the name of new technology, what is essentially a discarded technology in the West. The only way to contain and reverse the trend is to learn to distinguish between standard of life and standard of living or what I would call between ‘need’ and ‘greed’, and incorporate in our daily life style what we learn.

This especially holds good for those living in the rural area, or otherwise they are apt to look to urban areas for the model to copy. This is recognized in the Government document, but not explicitly enough to be able to appreciate that education is a process and that there is a rationale behind education which needs to be supported by a basic theory of how the process works, to mould national character.

We were always aware that the model of education that we have evolved for urban areas would not yield tangible results for boys and girls in villages, comparable to those in cities, as long as conditions of living are what they are inadequate for men to live as humans should-but we were hopeful that, as the GNP grew, with better distribution of wealth, material benefits would accrue to the poor villagers and would eventually create conditions for education on par with those available for students in the cities. We now know that these assumptions have not materialized even after planning for 35 years. Very little that we have done over the years has taken ‘root’ in the villages. We once thought that people from the cities would voluntarily settle in villages to render technical service especially in health and
agriculture, but soon after found that we were not willing to put up with the nearly intolerable condition of living and working in the villages. Even our call to impressionable boys and girls to develop a social and national outlook and serve in villages for short periods failed to make any worthwhile impact in transforming the situation.

Equally, bringing students from rural areas for training in the cities also failed, because boys and girls so trained preferred to settle in cities rather than go back to their villages, where they saw little use for the training they had received. If you and I have escaped poverty in villages by finding jobs in cities, why not they?

The assumption that the model we have evolved for education in the cities is the right model even for urban areas is also not borne out by experience, the emphasis in our current model is on specialization to earn a living, be it as a scientist, engineer, a skilled artisan, a lawyer, a tradesman, a farmer or a clerk. Even within each of these fields, we have specialization to a degree that we are unable to communicate. Each of us in the cities is so self-centered and materialistic under this system that we have lost touch with each other and with the society we are part of. We simply are not able to communicate within ourselves, nor see the purpose of education in terms of the common good for our society and our national. To put it differently, we no longer consider moral and social philosophy to have any place in our education.

Let us take the simple example of collecting and disposing garbage. In our neighbourhood, where each of us is well settled in life and where we call ourselves ‘educated’ we care little whether the garbage we throw on the street or around dust-bins inconveniences others and indeed is harmful to the community we live in. This is not to say that we are unaware of the need for observing self discipline in these and other matters.

The place of Adhyatma in Education

The changes we have made in our school education to meet this basic and other similar needs over the years are piecemeal, trivial. These changes are more directed at technical specialization. The basic fact is that we simply cannot call a person ‘educated’ however good he may be in his basic subject or vocation, unless he also has appreciation for humanity and that the basic tool for developing this appreciation is communication between mind and brain, or Adhyatma as I call it, under a sustained perturbation of our culture.

Science and technology have advanced to such levels that we are bound in our saner mood, to feel isolated, working to no clear moral purpose, however powerful we may be whether as an individual, a community or a nation. I am sure that even the most wealthy nations in the world feel this way. The speed of change in the modern world is so fast that we must think ahead carefully and so reform our education that we acquire this understanding of our responsibilities to ourselves, to one another and to the nation. A man simply cannot be called educated unless he had appreciation of his responsibilities as citizen of the independent and democratic country that we are. The indiscipline that we see around us will continually increase unless this vital change is incorporated in the holistic reform of our education right from childhood.

But such a change is not easy to achieve. There is obviously a limit to which one can enlarge the
scope of a syllabus to include humanities and social science. And yet there is a no escape from doing it. Fortunately, widening the scope of education to include general subjects does not mean increasing the burden of factual information, for ‘as science advance its explanatory power also increases’. It is, therefore, enough if we have an appreciation of the basic principles in the general subjects sufficient to be able to understand each other’s ideas and interact with them in order to decide how to incorporate the resulting conclusions in our daily life. To take an example, everything that we learn in Balwadi is meant to contribute to habit formation consistent with our culture on the one hand and moral and social values on the other, and so we cannot allow any option at this stage.

We might allow a little flexibility in the choice of general subjects in school years, but again not to the extent that we totally separate art, science, humanities and social sciences by the time we are in the 11th and 12th standards. We hardly need such options when our primary concern must be develop values and combine them with an intensive course in modern agriculture and allied industries to facilitate the earning of a good livelihood without having to leave rural areas. The number of elective subject might be increased in college but again not to the extent that we now do when we are so infatuated with material and technical specialization that we are indifferent to our social responsibilities as citizens of a great nation.

Whatever is argued in the previous paragraphs is not based on just normative criteria usually found in social and ethical sciences. In particular, the behavior of man is determined by the interaction between man and environment. There is more to this interaction however than inheritance in the Darwinian sense; it arises, as will be shown later, through education around sustained and appropriate social action. This is elaborated in what follows.

The conception of Human Behaviour and The Role of Adhyatma in Moulding it.

Our conception of human behaviour and of the method of moulding it has undergone great revisions during the past 60 years. It was Prof. Pavlov whose work first suggested that man’s behavior is shaped by experience and environment. Look at his experiment on an electric fence enclosing a cattle farm. The construction of a wire fence strong enough to turn a bull is not easy. What Pavlov did was to replace a heavy fence by one where one or two relatively thin strands of wire carried a sufficiently high electric voltage to impress upon the animal an appreciable shock when it short circuits by contact with the body. Such a fence might have to resist the pressure of the bull once or twice, but thereafter the fence acts not because it can hold mechanically under pressure, but because the bull has developed a conditioned reflex which tends to prevent it from coming into contact with it.

Here the original stimulus of the reflex is pain which the bull wants to avoid. The transferred trigger is the fence, One cannot expect such response without the opening of a synoptic pathway. There is really nothing in common between the pain and the fence, except the fact of repeated association with the original stimulus in a way which ensures that the presence of one revives the memory of the other. Even in the original experiment of sound and food on a dog, Pavlov observed the same. The effect of this action might not be permanent, but it is long lived once it passes
the threshold point. It is like the habit of applying the brake if we find someone suddenly coming in front of the car or changing the course contingent upon the indication from the steering wheel. Even though learning to drive calls for conscious effort over time, our action become instinctive and automatic once we learn the art.

It was natural to infer from Pavlov’s work that self discipline and values are best developed by promoting conditioned reflexes until the child learnt to channel its behavior as we wanted, by trial and error and by practice. However, this hypothesis which won for Pavlov a Nobel prize, came to be challenged in the fifties. Far from shaping the character as we desired it, it was held that man’s behavior was for the most part determined by his genotype and therefore by instinct. In part, the emphasis on instinct was extrapolated from studies of animals behavior and in part inferred on the basis of the DNA structure announced by Watson and Crick, with the human character being seen as the result of repetitive routine messages encoded in the genes of individual’s chromosomes.

The genetic determinism implied in this view denied education a major role in shaping one’s behavior. As an example, if some individuals behaved more responsibly or appeared more intelligent than others, it was taken to mean they were endowed with better chromosomes. This line of thought encouraged the family tree concept of evolution. As an example, Torries openly assert that “it is the pedigree that counts”. On the other hand, socialists, while acknowledging that individuals differ in their genotypes, persist in saying that man is what his environment and culture make him. The large number of books that are published every year asserting that whites are superior to other races because they have higher IQ originate from such political postures. Galton and Karl Pearson even went so far as to advocate the use of eugenics in improving the quality of the human race.

The decisive advance in our understanding of these conflicting views came with the experimental work reported by Goldsmith and Waddington. It is now nearly 40 years since they showed that careful selection of environmental conditions at critical periods in development can give rise to a wide array of phenotypes, so different that they appear as if they are gene mutations. Work during the last decade had given confirmatory evidence in humans which shows that larger amounts of DNA do not get automatically ranscribed and translated into RNA in the development of an individual. This variability is found not only in the sequences of amino acids, but also in the nucleotide sequences of introns. Clearly, some agent external to the system dictates the sequence. This agent is the mind which analyses the messages received by the brain in the light of previous experience and current needs and issues appropriate orders on the genes to be activated to meet them. Almost all the data reported in the literature, such as by Jacob and Manod on Ecoli organisms (1972) and those that I have analysed on behavior of food needs support this inference. Evidently, man and environment synergistically interact to regulate man’s behavior within limits defined by their covariance. The fact that the genetic code is tigid in indicating the order of assembling aminoacids to make the protein plays no part in the whole process. Available evidence leaves no doubt that man enjoys the capacity for plasticity and versatility in action. It is these which enable man do conscious thinking and find appropriate solution to meet the challenge.
Genetic Theory of Behavioural Traits

The common belief that the genetic and environmental components of phenotypic human behavioural traits are independent is apparently wrong. We do not have to go too far to illustrate it. We are all familiar with the growth curve of healthy active children, such as in USA.

It will be seen that growth increments vary enormously from one quarter to another. Some children are seen to grow twice as fast as others, with the relative ranking in growth rates changing rather considerably from one quarter to another as they grow. The original data show that the mean growth increment decreases with age, so does the standard deviation, but the coefficient of variation is rather stable from quarter to quarter. None of these children were short of food, there is also no report that the experienced any ill effect of malnutrition.

The evidence shows that a healthy active child does not move within 10 percent of the median weight curves joining median percentiles at annual intervals as assumed under Gomez classification. Keeping close to the median percentile apparently has no significance for health, though, as Roshe and Himes observed (1980), the growth rates become steady near the extremes and naturally become cause for concern, the data show that it is in fact common for children to grow at rates which are outside the 90th and 10th percentiles of the median weight reported on the respective children. Further, if a child showed growth increment that is too high in one time interval, it will have a low rate of growth in the next interval or interval thereafter. This is very clearly brought out in the analysis of variance of growth increments expressed as percentile of the observed median for the respective intervals in the following tables.

It will be seen that the intra individual variations in children, as they grow is over three to four times as large as the estimated true variance between them. In other words, children change paths of development over a fairly wide range depending upon the location in time and the momentum they receive in the environment in which they grew from conception onwards. Apparently, the relationship between body weight and intake is not linear that we assume it to be but is variable as the child grows. The implication is that a fixed supplement.

TABLE-1 Anova of Growth Increments in Boys from 0 to 36 months.

| d.f | S.S   | M.S. | Est true variance |
|-----|-------|------|-------------------|
|     |       |      |                   |
| Between children | 10 | 35.1 | 35.1 | 23 |
| within children   | 121 | 968.8 | 8.0 | 8.0 |
|                  | 131 | 1320.0 | 11.3 | |

TABLE-II Anova of Growth Increments in Girls from 0 to 36 months.

| d.f | S.S   | M.S. | Est true variance |
|-----|-------|------|-------------------|
|     |       |      |                   |
| Between children | 8  | 191.5 | 24.3 | 1.6 |
| within children   | 99 | 525.5 | 5.2 | 5.2 |

Note: The data reported in these tables from parl of a much larger data collected by Prof. k. Sheth and his colleagues at Milwaukee, USA.
TABLE – III Pooled Analysis of variance for all Adlib experiments for BMR (Kcal/min)

| Source                  | D.F. | M.S.S | F.        | Estimate of true Variance | ± of total Variance |
|-------------------------|------|-------|-----------|---------------------------|---------------------|
| Between subjects        | 10   | .3625 | 8.28**    | .0133                     | .20                 |
| Within subjects         | 33   | .0438 | 2.53**    | .0044                     | --                  |
| Between days            | 220  | .0173 | --        | .0173                     | --                  |
| Total                   | 263  |       |           |                           | 37.84               |

Average B.M.R. (Kcnl/mi) : 8062; No. of days: 24; No. of Subject: 11

Table – IV Pooled Anova for Adlib Energy intake (Kcal/D)

| Source                  | D.F. | M.S.S X 10 | F. x 10 | Estimate of true Variance x 10 | % of total Variance |
|-------------------------|------|------------|---------|---------------------------------|---------------------|
| Between subjects        | 10   | 3.89       | 11.32   | 0.1480                          | 2.99                |
| Within subjects         | 33   | 0.344      | 1.64    | 0.0225                          | 5.06                |
| Between days            | 220  | 0.094      | --      | 0.2094                          | 15.45               |
| Total                   | 263  |            |         |                                 |                     |

of calories, say 300, cannot be expected to produce the same change in body weight in all individuals even when they are similar, nor over time in the same individual. Clearly, calories, like nutrients, are used with increasing inefficiency as the intake increases. If feeding programme do not result in all children showing uniform gains in body weight, one need not feel surprised. Is it not true that on similar intakes and similar levels of activity, some of us gain in weight and others do not? And even on biological grounds, the difference between phenotypes are not expected to remain the same in all environments.

A direct evidence of the inference that calories are used with increasing inefficiency as the intake increases is also brought out by studying ANOVA of intake and BMR as shown in tables 3 and 4 based on the results of metabolic experiments in my laboratory. It will be seen that the mean square between individuals, say $S^2_b$ is significantly larger than the mean square within them, say $S^2_w$. It is further seen that within individuals, the mean square between weeks is significantly larger than variation within week.

We have developed elsewhere a model which explains these results (Sukhatme and Narain, 1982). The model tells us that the additive model used in ANOVA, viz.

$$Y_{it} = \mu + b_1 + e_{it}$$

Does not hold. In this model, following the usual notation.

$Y_{it}$ is the energy intake of the ith individual on the tth day.

$\mu$ is the overall mean and

$b_1$ is the random effect peculiar to the ith individual with variance $\sigma^2_w$. That is to say that $b_1$ cannot be regarded as a random effect and hence the variance of the mean intake of a individual when averaged over, say n days is given by

$$\frac{\sigma^2_b + \sigma^2_w}{n} \quad \ldots .. (2)$$
The expression for variance implies that each individual is peculiar in inheriting from his parents certain genetic potential for coping with variation in energy intake but this potential cannot be wholly genetic in origin because it will have certain environmental effects permanently associated with the individual's development within the intra-uterine and external environment experienced by him such environmental effects will provide a common environmental component of variance over and above the genetic component. On the other hand the component $\sigma^2_w$ due to purely local environmental effects will vary from day to day.

It follows too that we can express the variance of the mean over $n$ days simply as

$$V_P \left\{ r+1-r \right\} \quad \text{or as} \quad r^\nu \quad \text{…….. (3)}$$

where $V_p$ is the total phenotypic variance and $r$ is the intra class correlation representing the fraction of phenotypic variability due to genetic and environmental causes.

But as tables 3 and 4 show, the story does not end here. The within variance component $\sigma^2_w$ does not remain purely environmental. The individual advances in time under a sustained change in the common external environment. Instead, the week to week variation is found to be significantly larger than the within week variance component in the same individual, indicating that the day to day observations are serially correlated. This means that the genetic physiological process of energy metabolism does not remain the same each day but adds to the variance of the mean in $n$ days, a component due to covariance between the genetic entities possessed by the individual and to local environment provided by the food intake of different days. If we denote this component by $V_{GES}$ we may $V_p$ of the mean simply as

$$V_p=V_g+V_{Eg}+V_{GES} \quad \text{……..(4)}$$

This evidence gives us an opportunity to elaborate our model (1) with $e_i$ being replaced by say

$$W_i \rho W_1 (t-1) + e_{it} \quad \text{……..(5)}$$

Being the serial correlation of order one. In other words, we say that a part of the variability in energy intake on a given day is explained by its value on the immediately preceding day or days.

If we now assume for a moment that there is no inter individual variability, all the variability being only due to intra individual differences, then the variance of the mean of $n$ observations in repeated sampling of the same individual will be given by

$$\approx \sigma^2_w \frac{1+\rho}{n-1-\rho} \quad \text{……..(6)}$$

Where $\sigma^2_w$ will now be intra-individual variability not $V_p$. This expression can also be alternatively written as

$$\sigma^2_w \bar{r} \quad \text{……..(7)}$$

where $r$, by analogy with (3) can also be written to denote the average correlation between observations since

$$V(P_n)=V(g)+V(e)+\text{Cov}(g,e) \quad \text{…….. or simply as}$$

$$\approx \bar{r} \sigma^2_w \quad \text{……..(8)}$$

Because $V(g)$ in the same individual will be zero and $V(e)$ will tend to be small as $n$ increases.

We have here a case much like that reported by Jacob and Manod on E-coli. This organism had a
battery of three genes which are ordinarily inactive, but are known to code for proteins when it uses galactosides to meet its energy needs. In other words, the organism is known to switch its genes into action to code for enzymes it needs whenever it is confronted with a sustained change in its environment. This is precisely what enables a man to indulge in food under conditions of affluence, what being overweight. Experiments in our laboratory confirm that such men dissipate heat when the body is overheated, as long as the excess intake is within limits of the homeostatic range. The same plasticity serves the poor in protecting them against reduction of work output and body mass over a sizeable range. Thus in regard to food, intake is not determined by appetite alone but also by the ability to digest the food and ability to convert the absorbed nutrients into energy for the purpose of the activity in which an individual is engaged. The more one eats above the lower limit of the range of homeostasis, the more would undoubtedly be the nutrient intake, but more would also the chance that he would impair his digestive efficiency; it is even possible that some of the absorbed nutrients may find their way not for storage of energy for muscular work or for deposition of fat. We cannot therefore consider a person undernourished unless he eats outside the limit of the homeostatic range. And even outside the homeostatic range he need not necessarily be under energy stress as judged by intake per kg of body weight, even though his body weight and intake may be smaller than those of the reference individual, indicating effect of long term genetic adaptation. In practice however given adequate incentive, he is more than found to make up for it by working for longer hours. He would not survive if he did otherwise.

If we do not interpret variation over time in behaviours traits in this way, it would be tantamount to assuming that the variance of the observed trait, say P, is the simple sum of the variances of the genotypic and environmental components

$$V(P) = V(g) + V(e)$$

When in actual fact g and e synergistically interact, as we saw above, to account for the observed variability. To assume that V(e) is negligible relative to V(p) as was implied in the writing of Wilson and his colleagues in the fifties, is to overstate the influence of genetic determinism. Equally, at the other extreme it means overstating the influence of environment and culture in shaping the behavior of man as Pavlov’s work appeared to suggest.

**Feedback Capacity and Regulation**

We have seen that the covariance between g and e can be written as

$$\sigma_{gw}$$

where \( \sigma \) represents the extent to which the genotypic and the environmental components interact within an individual. The covariance in this form can be said to represent the amount of information that a message carries between one’s mind and brain when past experience or an intended change in environment is considered as the input. It is this information that gives man the feedback capacity of controlling his system by creating order.

The merit of the synergistic variation lies in the fact that it has a non random structure implies stability in the pattern of variance over time. Its properties are stationary variance and variance. This variation is not prefigured in the genes but is brought about by a synergistic interaction
between mind and brain under a sustained change in environment. The function of Adhyatma is to encourage this interaction in a student and to improve through it the capacity of individual organs of the body to function.

The coefficient of correlation $\bar{r}$ is ordinarily small. This is to be expected, since a message is almost, by definition, jammed with noise to ensure that it does not fall in the hands of other and yet can reach those 'to whom it may concern'. In fact a message without noise in the background has little meaning in practical life as our experience on the telephone indicates. It is neither the size of the range nor the amount of information that counts but the amount that is filtered through noise which accounts for the small value of $\bar{r}$. Again ordinarily, information must lose its effectiveness with time unless it is reinforced. For this reason, the contribution of $\bar{r}$ appears in the form of non random components of variation and remains stable even when the behavior is averaged over several days.

This means first, that a behavioural trait is a homeostatic process and that man has the power within him to regulate it through negative feedback whenever the process is disturbed. Consequently, an individual who behaves in one way under a given situation at time $t$, will be influenced in his behavior by his earlier experience at time $t-1$ and before over a range. In other words, man’s plasticity in behavior will not be unlimited nor clearly predictable as postulated in the fifties, but limited within a range determined by the pattern of homeostasis.

**Patterns that perpetuate**

Our body is of course made of what we eat, breathe and consequently, the atoms and molecules of which our tissues are made change; this is metabolism. We are not therefore the ‘stuff that abides, ‘but patterns of homeostasis that perpetuate themselves. We do not know the range or the nature of the pattern ourselves, but we do know that these patterns work in individuals who are healthy in body and mind. These patterns have the property of stationer variance and covariance. We can therefore broadly say that when Adhyatma forms the core of education process, we may be sure that the range determined by homeostasis can serve to give an idea of the hard edges of the extent to which man’s character can be moulded through education. The non random nature of observed variation ensures that the pattern is controlled by adjustment of endogenous variation e.g. BMR and hence the regulation is costless and automatic.

One might think that the absolute magnitude of $\bar{r} \sigma^2_w$ will ordinarily be small. This is true but the whole phenomenon had in it the property to secure a much larger effect. It is a case much like that of a thermostat with a thermometer recording the temperature and the electric signal to which it is attached calling for release of energy enough to heat the house.

In plants and animals, an individual genotype can be replicated and its development studied over a range of environmental conditions to evolve high yielding varieties and animals using selection and culling. However, this approach is neither moral nor feasible in man, nor even necessary, because, by nature, man is an outbreeding individual, creating individual variability which is empirically found to be wider, more flexible and more vigorous than that of hybrids. Consequently, the notion that the subject of evolution applied only to
population and not to individuals is not true for studying behavioural traits, at least in the case of man. This aspect of individual human variance is similar to genetic variability, except that whereas the latter is a product of a single genetic segregation of the chromosomes inherited from the parents, the mutable expression of the variable potential of the individual, within the limits set by genetic inheritance, is developed from multiple interactions between genetic and environment components with in the same individual.

It is through the control of these interactions by education in its broadest sense, as the culmination of racial history and social experience, that man owes his supremacy among the animals. It follows that given a determined conscious effort, as in Yoga, the covariance $r \sigma^2_w$ can be exploited by man to regulate and control one’s conduct, character and behavior. In many ways this idea underlay the entire Gandhian belief in human perfectability. However, what is both new and exciting is a rapidly growing core of hard scientific data demonstrating an immense range of short term intra-individual variability, almost as great in scope as the well known inter-individual variation which is also being proved to be wider than we had once thought.

Central Evolution

It will be only fair if, at this stage, I refer to the work of the great philosopher Herbert Spencer on Education. It is reported that his work on education had sold more than 50,000 copies during his life. I refer to his work because Spencer was, to my mind, the first systems philosopher to express the views somewhat similar to those in the preceding paragraphs. Unfortunately Spencer mixed up development with evolution regardless of whether the trait was a behavioural trait or not. He wad led into mixing up the tow because o the faulty argument which he used in tracing the evolution to the law of conservation of energy in the universe. What he apparently meant wad that an individual develops in the Darwinian sense through the unfolding of repetitive instructions, but evolves in the sense that genotype interacts with the environment to influence individual behavior within a single generation.

Spencer’s handicap was that he did not have the evidence of the within variation stability that we have today but he was right in associating evolution with the attribute of a hierarchically organized structure that society, man and organs are, with ultimate units enjoying a measure of autonomy. Implicit in this structure are the revolutionary advances in the conceptions of science and attitude to life that were made in the beginning of this century. As Medawar observes, it is with its help that we can understand why men lose capacity for work or die even before their organs cease to function, making transplants feasible. Again, the fact that a nation distintegrates, even before the society or states within it do, appears to be result of the same property.

A question arises here. If Yoga in education is a vital element in improving human quality, why does our noble constitutional goal of compulsory fee education for all upto the age of 14 does not take note of it? The answer is that we like to copy what the Westerners do with the result that our present highly materialistic and theoretical primary school syllabus is totally inappropriate for our people who depend directly on the life of the land for their subsistence and in part our educationists are unaware of the role of Adhyatma in education.
What is needed is a practical core syllabus around a social action relevant to the village environment which concentrated both on practical skill development and on development of a community character with boys and girls working as equals to improve rural life.

It is clear that if primary schooling it must have a rural bias and realistically reflect the society in which the child is most likely to remain. In which the child is most likely to remain. In India this society needs a syllabus which gives particular emphasis to aspects of agriculture, health and nutrition and especially moral and communal planning where Adhyatma and the belief in individual perfectability form the core of philosophy. A child cannot possibly develop a feeling of unity with society and country unless he converse with his own mind on the right and wrong that are involve din moral and social philosophy and is thus able to distinguish between need and greed.

We have in India examples of such schools in Jnana Prabodhini (JP), Pune, where Adhyatma forms the core of teaching, and yet the standard of education in science and technology is so high that JP boys and girls have always been among the top at all-India examinations. Jnana Prabodhini also had an agricultural school in the rural area to ensure that villagers are served in their desire to raise agricultural productivity with a minimum input that can give them capacity to earn equal, if not superior to what they are likely to have under urban conditions. Further discussion is beyond the scope of this paper.

**SELECTED BIBLIOGRAPHY**

Ministry of Education, Government of India, Challenge of Education (1985).

Manod, J. Chance and Necessity, Collins, London (1962).

Roche, A.F and Himes, J.H Incrementa Growth charts, Am. J. Clin. Nutr 33, 2041 (1980).

Sukhatme, P.V and Narain, P. Genetic components in Man and Environ-Nutrition and their Implications for Policy published by MACS Research Institute, Pune, ed. Dr. P.V sukhatme, (1982).