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## BOOK REVIEW

Brij Bhusan Vij. *Towards a Unified Technology*. pp xvi+270. 1982. Soni Book Agency (India), New Delhi. Rs. 100.00

This book though entitled 'Towards a unified Technology', deals mainly with the units of physical measurement. It starts with a little history of the efforts to introduce metric system of measurement in India during the British rule and then its adoption after independence.

In Chapter III the author expounds his main idea that "measurement of time and angular dimensions remain the only areas which have not come under the fold of metrication or decimalization". He suggests that instead of taking 60 seconds equal to a minute and 60 minutes equal to an hour, and 24 hours in a day, we should have 100 seconds (to be called metric second) equal to a minute (metric minute) and 100 minutes equal to an hour (metric hour) and 10 hours (metric hour) to the day or night period. Thus instead of $60\times 60\times 24$ seconds for the days duration it should be $100\times 100\times 20$ metric seconds. Taking 365 metric days *exactly* as the time taken by the earth to revolve round the sun (p. 205) we will have $365\times 20\times 100\times 100=73\times 10^6$ seconds in the year in place of 315 569525.9787 seconds for the mean tropical year. Thus he defines one second (metric) as the fraction $\frac{1}{73\times 10^6}$ of the mean tropical year (ephemeris time) which correspond to 39 73 85 20 59 period of radiations of Caesium 133 atom (p. 54). Accordingly the duration of his new metric second will be 0.432866572 second of the existing time scale.

In plane and solid geometry also each degree will have 100 minutes and each minute 100 seconds instead of the present degree of 60 minutes and each minute of 60 seconds. Also each quarter of the circle will have 100 degrees instead of 90 so that the sum of angles subtended at the centre of a circle is equal to 400 degrees. All this is simple enough and tables for sines, cosines, tangents etc. have been compiled.

However, this change of duration of interval of time, second, will mean a change in the magnitude of the fundamental constant, Planck's Constant.

The author then takes to redefine other S.I. units (p. 94). Thus for defining the unit of length, metre, he starts with the known value of velocity of light as $2.99792\,456\times 10^{10}$ cm/sec. on the existing time scale, and deduces this value equal to $1.295662715\times 10^{10}$ cm/metric sec. Accordingly metre is the length represented by a time interval of 77.1627095 pico metric seconds at the velocity of light. He also introduces new metre 1.000227415/2 times the present metre (p. 223) to give the earth a mean radius equal to 6366200 metres. It is interesting to note that internationally

also the new S.I. definition for metre is in terms of velocity of light instead of the number of wavelength of a given source.

The Unit mass, Kilogram, is defined as $2730112559 \times 10^{41}$ particles of Caesium 133 atom. In the definition of ampere for measuring the force per metre length of the current carrying infinite parallel conductors, the length of his new metre is employed leading to a new value of ampere.

For temperature measurement he proposes to choose the steam point instead of the thermodynamically stable triple point of water (0.16 K in the S.I. definition) because of his fascination for its value as 100° on centigrade scale. Then taking steam point as 273·16+100=373.16 he proposes to divide the interval between absolute zero and this so called 373·16 into 100 divisions so that each graduation on his "universal temperature scale" will be equal to 3·7316K. Ice point is quoted (p. 88) as 273·16 and not the triple point of water as on IPTS scale.

He gives a definition for his new Candela in terms of the temperature of freezing platinum as 548·211 UT and his new defined metre.

He goes on further to discuss the reform of the calendar and discusses his Metric Calendar Year and brings information of ancient Hindu Calendars and from Mohenjodaro. Reform of Calendar is a big task and has engaged the attention of several persons, in the past and can hardly be achieved here.

In conclusion starting with the simple idea that in a day instead of $24 \times 60 \times 60$ seconds, it would be better to have $20 \times 100 \times 100$ seconds from the point of "metrication or decimalization", the author has taken upon himself the burden of redefining all the quantities which are defined in International System of Units (S.I.) and are internationally accepted. Added to this is the reform of calendar.

And now a word about the title of the book "Towards a Unified Technology". The book hardly deals with technology and its aspects. It is felt by the author that once the basic units are established the "unified technology" can be built up on them.

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Ahsan Jan Qaisar. *The Indian Response to European Technology and Culture (A.D. 1498-1707)*. pp. XII+225 Plates 20+4, Oxford University Press, Delhi 1982, Rs. 140.00

The book besides Introduction has five chapters, including a Prologue (Chapter I) and an Epilogue. The prologue deals with contact of Europeans in India regionwise,

its pattern nature of response and communicativeness. Second Chapter deals with shipbuilding, Land Transport, Military Technology, Printing Press, Mechanical Clocks, Glass Technology, Mining and Textile Technology. Third Chapter deals with Painting, Architecture and Music. Fourth Chapter discusses social and cultural responses, covering language, food, dress, manners and etiquette. It has a few (24) reproductions of painting covering different technologies mentioned in the text.

The book has been prepared as a result of extensive study, has considerable number of references, additional notes and a good bibliography and provides a fairly interesting list of paintings dealing with the subject. It is an interesting work which is of some use in the context of information as is able and is put into one place.

However, there are two major weaknesses of the book which require some comments.

Firstly, the book relies on developing the theme from European and English Sources, with regard to the reaction of Indians. This leads to a one-sided impression in view of the interests of the British, their prejudices and their overall trade, economic and political objectives. It would have been desirable to look at various Indian sources, as to what sort of reactions Indian had. This is extensively available in the writings of Iswar Chander Vidyasagar in Bengal and Sir Syed, Ghalib and Hali in North India. A few studies by Dr. Ranade bring out the impact as seen from Marathi literature. The *Zamima* of Hali's *Musaddas* speaks eloquently of the reaction of Indians to European science and technology. The earlier literature, if scanned, may bring out a different picture than what has been painted.

Secondly, reading the book one gets an impression of outdated concept of technology and a mechanical approach with regard to the dissemination of different techniques evolved at different times. Historians of science no longer believe in the linear evolution of technology,—that every new (or different way of doing) thing is an advance. Technological innovations are made to meet a set of demands. The latter can be cultural, industrial, economic or purely to give an advantage over a competitor or to meet a fashion. England and India were culturally different, the need of the former culture were different from those of India. The changes made in one may not be needed in other. Consequently, looking into individual items and response to them may lead to a misleading picture. It may be worthwhile to look into two areas to illustrate the point.

$$\text{Solar} \rightarrow \text{wood} \rightarrow \begin{matrix}\text{charcoal}\\ \text{dung}\end{matrix} \rightarrow \text{coal} \rightarrow \begin{matrix}\text{hydro}\\ \text{thermal}\end{matrix} \rightarrow \text{electricity} \rightarrow \text{petroleum} \rightarrow \begin{matrix}\text{nuclear}\\ \text{energy}\end{matrix}$$

This linear scheme can no longer be sustained, in view of new emphasis on such areas as solar, biogas, wind and other non-conventional areas. In other words one can use a source of energy, based on requirements nature of various consideration such as those of environments, non-renewability of resources and nature of pro-

duction system. And the adoption of one source in preference to the other may not be considered as advance. In the case of drug industry the point becomes more forceful.

The evolution of European system of medicine has been spectacular both in terms of knowledge of diseases, production of drugs as well as the health care. The development of synthetic drugs made the herbal drugs look outdated and the elaborate hospitalisation system such as sanatoria made the home-stay of appear primitive. However, recent studies in the after-effects, residual effects of drugs has now lead to going back to herbal system and it is now found that in the case of many diseases home-care is adequate. Increasingly it is being realised that European system is based on mechanical philosophy now discarded in science, and its basic motivation is profit rather than helping those who are in need of help. Non-adoption of European system may not be due to conservatism or backwardness.

Incidentally areas chosen, to reflect Indian reaction to European technology and culture also reflect a bias, in so far as these are the areas which are of particular need of European culture of the period– navigation, Press, mechanical clock, glass technology. In the case of military technology dealing with land warfare, the strength of Indian technology is revealed, in so far as its adoptiveness and development are concerned.

This brings to surface the need to look into responses in those technical areas which were part of the Indian cultural and technological tradition such as textile, metallurgy, use of agricultural and forest material and residues, food technology, cosmetics etc.

The above example should not be taken to mean that everything was right with Indian culture and tradition. What it aims to point out is that in dealing with technology and its impact on society or its dissemination in other culture area one needs to have a proper conceptual framework.

The theory that Indian response was positive where Indian interests were threatened is at best a very superficial way out of dealing with the complexity of technology and its impact on society and the same can be said for demonstration effect theory. The question of lack of interest in Press and the clock can not be washed away by such comments as "A matter of taste perhaps"? It requires greater study as both are part of cultural features, political and social set up of society and closely linked to the productive system built by society.

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