Science as an Aid towards Value Education

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My presentation will consist of two parts. In the first part, I will begin by defining, what I mean by 'value education'. I will then consider, why science is relevant to our aim at providing value education. In the second part, I will suggest some ways in which science can play a useful role in providing value education.In this way, I shall have dealt with the different components represented in the title of this talk.

What is value education?

It is generally assumed that, education provides value-addition. Just as a piece of raw material acquires added value, when it is converted to a finished product in a factory, one can say that, the process of undergoing education should make a person into a better person. Normally, it is also assumed that the proverbial "three R's" do this job. But, the question that we are asking in this meeting is, whether our present system of providing the three R's does indeed lead to value addition.

I see 'value education' as providing in the first place, good moral values, that make the person into a better

person, both individually and as a member of the society he lives in. The person should feel the urge to bring about spiritual and material improvement, not only in his or her own state, but also in the state of the society. Likewise, he or she should be aware of the threats to the society and suggest actions for countering them. Our old saying "Satyam vada, dharmam chara, swadhyayad ma pramadah..." aptly summarizes this view.

If the educational system does not produce such individuals, then it is merely a medium of imparting information and comprehension to the students. The need to convene this discussion meeting indicates quite clearly that, we all feel that our present system fails to provide the necessary value addition.

There have been views expressed in this meeting that we are aware of these failings: what we need is some way of removing them. So, here I will discuss some possible ways of bringing real value addition to our present educational system.

The appreciation of science as a driving force

Science is the key to this process. Taking a historical view, it is clear that, in recent times science has become a dominant force in the social dynamics. Unlike up to two centuries ago, even a century ago, the influence of science is no longer confined to the walls of the laboratory or to the few workers, who carry out scientific research and teaching. It has come out of those narrow confines and, through its technologies, developed into a dominant entity.

We all recognize the foundation building of science done by Isaac Newton. Yet, in Newton's time, science was

not a major social force. It had its excitements and controversies, but those were limited to the practising elite. When two centuries later, Michael Faraday showed his laboratory dynamo to Queen Victoria, she asked, what was its use. Faraday is supposed to have replied: " Your Majesty, we do not ask, what is the use of a new-born baby!" Sure enough, that particular baby grew to a stage, where it could provide electric power to huge cities and remote villages.

Today, if we examine our daily routine, we find that we are using numerous scientific inventions of very recent times. The cell phone, the internet, the computer automation, etc. are of less than a decade or two, in age. The atomic energy and space programmes did not exist before the middle of the last century. Even in the villages, the contributions of technology are able to reach and produce tangible effects.

I like to give the analogy of a buffet dinner, in which you are invited to sample various dishes. However, in this particular dinner, new dishes appear on the table with time, and with increasing rapidity. They are diverse and apparently very attractive. So you are tempted to try them as they come. However, your absorptive and digestive capacity being limited, you will naturally feel the ill-effects of succumbing to this temptation. In the same way, human societies are being presented with attractive looking technological inventions at a rate, far faster than they can be assimilated. So, the ill-effects start becoming apparent in a short while. Take the examples of the apparently beneficial inventions. Nuclear energy can provide us with our energy needs. Yet, it has the problem of how to dispose of the nuclear waste and also, how to protect against hazards of leaked radiation. Better living

standards are provided by many consumer products; but to make them, we have to take offensive action against nature, produce pollution and medical problems. Computers and automation certainly achieve a lot more than possible by manual efforts, and that too cleanly: but it leads to unemployment and idleness that breed criminal tendencies. Biotechnology helps in agriculture, but it also opens out possibilities of human cloning whose dangerous implications are not yet fully appreciated. So, someone has to decide how we control what science can give. And, that buck cannot be passed on to any one person. It has to be faced by the whole society. Which is why, when we are thinking of providing value education, we cannot afford to ignore science from our consideration. With this background, I now come to the second part, in which I discuss how science can provide aids to value education.

Science as a part of the curriculum

The crux of science lies in curiosity. The strides science made were based on finding answers to why, how, where and when. When the apple fell on Newton or, when James Watt saw the steam knock the lid off, they were curious to pursue the matter further. It is ironical therefore that today the system of our school education discourages students from asking questions. Nor does it provide them with opportunities to do experiments. Rather, science in the school curriculum is presented as a subject to be memorized and reproduced, word for word from the book.

I recall that my five year old daughter, in the first standard in Central School, was asked to write several times the sentence, "The sun rises in the east and sets in

the west." As she wrote line after line, she wondered how the sun, which disappeared in the west at the end of the day managed to reappear in the east, the next day. Yet, this question was not aired in the class. Surely, one could pause and worry about this question and thereby, discover a remarkable phenomenon of our solar system. I believe, science should be taught through questions and answers which are discussed, debated and experimented upon. This way, we nurture the quality of curiosity amongst the children, a quality that will make them more alert citizens.

It will also encourage them to develop the scientific temper, which a quality scientific study teaches us, but which extends well beyond science. Never accept a statement as true unless you have factual evidence for it. In this day and age, we are still riddled with superstitions and badly need the scientific temper to cut through their opaque curtain. So, in the last analysis, I would say that, even if it means cutting the syllabus to half its size, try to cultivate the spirit of curiosity amongst the school-children.

Science as a part of human culture

Textbook science merely tells us the laws of science and their applications, in cut and dried form. It rarely tells us the creative struggle that went behind their discovery. The path of science over the ages has by no means been straight and narrow. It had many turns and bumps along the way from the uneasy interaction with the society, whenever new facts threatened established tenets. Indeed, a course on history of science will be very desirable at the higher secondary school level. It will teach us to be more cautious in accepting new results, but at the same time,

make us feel receptive to new ideas, if they are backed with facts.

Indeed science may be objective but its practitioners are not, and they have the same human failings as their neighbours. It will teach the child to be more open in its attitude, if it learns of the way prejudices have hindered the progress of knowledge.

Science providing technological aids

The new technologies have given several easy means of communication, thus bridging the gaps between the teacher and the taught. That is how the phrase, 'distance education' is gaining popularity. I feel that with modern techniques, inspiring personalities could address school audiences, located far away and in remote places, on values in life. I can imagine how profound an influence we would all have had on us, if we had similarly listened to Swami Vivekananda or Dr S. Radhakrishnan.

Also, the use of search engines can be a great boon to students seeking important sources of information relating to their studies. They can also be encouraged to access articles by inspiring writers. Further, we can encourage question-answer sessions between scientists and students. I have a practice of asking autograph-hunting students to write a question on a postcard and send it to me for a reply. That way, they have to work for an autograph and, I have to work harder in replying to their questions!

Science and humanism

Although science and religion are sometimes said to

be confronting each other, there are commonalities between the two. Both are searching for the truth. In religions, seers have unique experience of revelation of knowledge that others cannot have. In science on the other hand, any result of an experiment done by scientist A, must be also obtained by any other scientist B, performing a similar experiment. Thus, the truth, in both cases, has different background. A scientist can, and usually does share the humanistic values, that all religions advocate. It will be useful to have some discussions in senior classes on what are the perceptions of famous scientists, like Einstein, on religion and what have famous religious personalities like Swami Vivekananda said, on science.

These, in short, are some thoughts that come to my mind, while participating in this very interesting seminar and I thank Swami Prabhanandaji for giving me the opportunity to air my thoughts.