

India is the most important state in a position to protest against all such projects, and, as I have shown, it has special reasons for doing so. The Indian Government might also initiate experiments designed to estimate the probable effects. The figures which I have given are conjectural. They may be too high by a factor of ten or even more. They may also be too low. The experiments on mice whose results have been so far published in the U.S.A. were not so designed as to estimate the risk. They showed that some genes in mice were much more easily caused to mutate than genes in *Drosophila*, but they gave no estimate of the number of genes at risk. And one cannot safely argue from mice to men. But the risk to mice could be determined experimen-

tally, and the effects of X-rays or gamma rays on human and mouse tissue cultures compared. The research could be done in India. I have worked out a scheme for the research on mice, but wish to discuss it with colleagues before publication.

I am quite aware that it is frequently stated that so many people die already from the effects of mutation that an increase by an extra few per cent. does not matter. Such an opinion does not coincide with my own ethical views. I venture to hope that these views are shared in India.

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1. *Nature*, 1955, 175, 873.

2. *Genetics*, 1955, 40, 597.

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### CONFLICT VS. CO-OPERATION AS FACTORS IN EVOLUTION\*

A SEGMENT of Acharya J. C. Bose's own philosophy of the "Unity of Life" forms the subject-matter of this Memorial Lecture. According to Bose, it is a misunderstanding of the Laws of Nature to regard conflict as the only factor in evolution; far more potent than competition is mutual aid and co-operation in the scheme of life. He had also pointed out that there must be unity of all human efforts and that in the realm of the mind there can be no boundaries and no separations. For, the evolutionary process has been active not only in morphological differentiation, that is, in the development of new forms, but also in physiological differentiation, that is, in the development of special mechanisms for performance of various vital functions. Thus every organ of a living being is an instrument subserving a particular function for the advantage of the organism.

The above views expressed by Bose as early as 1927 are not only very significant and important but prophetic when judged by the present-day urge for peace among the nations of the world through the adoption of the principles of *Panch Shila*. Modern development in the biological sciences would also tend to refute the Darwinian principles of evolution through random variations, competition, struggle for existence, natural selection and survival of the fittest, and lend support to evolution through the adjustment of organisms to the physical and biological factors in their respective environments. Thus the principle of co-existence, in spite of varied conditions of life, is biologically sound for all living organisms, including the human race. Biological principles would only appear to lend support to the philosophy of Acharya Bose that "far more potent than competition is mutual aid and co-operation in the scheme of life".

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\* Abstract of the Seventeenth Acharya Jagadish Chandra Bose Memorial Lecture by Sunder Lal Hora.

### INDIAN SCIENCE CONGRESS, FORTY-THIRD SESSION, AGRA

THE Forty-Third Session of the Indian Science Congress Association will be held at Agra during the week 2-8, January 1956, under the presidentship of Dr. M. S. Krishnan. The session will be inaugurated by the Prime Minister, Shri Jawaharlal Nehru.

Besides scientists from all parts of India, the following distinguished visitors from abroad are expected to attend the Congress: Prof.

Martin Eichler and Prof. C. L. Siegel (W. Germany), Prof. B. A. Houssay (Argentina), Prof. M. H. Stone, Dr. D. W. Bronk and Dr. Robert Oppenheimer (U.S.A.) and Dr. J. H. Burn (U.K.).

A number of symposia have been arranged and an exhibition of instruments, apparatus and equipment will also be organised during the session.