

## M. N. SAHA – THE SOCIAL SCIENTIST

VASANT NATARAJAN\*

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*This article covers the social contributions of M. N. Saha. Among other things, it covers his contributions to calendar reform and flood management. Many of these articles have appeared in this journal when he was heading it.*

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**M**eghnad Saha was an unusual scientist of the last century. Not only was his scientific work of the highest caliber, but he was also highly socially conscious and wanted to use the advances in science and technology to improve the quality of life of his fellow citizens. Specifically, he wanted to contribute towards education, industrialization, health care, and river valley development, in modern newly-independent India. In order to achieve this, he got elected—with a thumping majority—as an MP from a Lok Sabha constituency in Calcutta in 1951. He was elected from the relatively unknown “Revolutionary Socialist Party”. This is because he was not a member of the ruling Indian National Congress, where he did not see eye-to-eye with Mahatma Gandhi about the way for progress in modern India—Saha believed in heavy industrialization while Gandhi believed in the pre-industrial-revolution *Charkha* and *Khadi*.

One of his greatest contributions was as the head of the “Calendar Reform Committee”. The task of the committee, constituted by the Council of Scientific and Industrial Research (CSIR), was to prepare a calendar based on scientific ideas, and one that could be adopted uniformly across the country to replace the thirty-odd “religious” calendars used in the country at that time. Jawharalal Nehru, the first PM of independent India, wrote a preface to the report of the committee. Nehru wanted to inculcate scientific temper among the members of the society at large. He realized that the existing calendars represented past

socio-political divisions in the country and the religion of the local King, and a new scientific calendar was needed for a unified “secular” India. The committee recommended the adoption of the solar-based Saka calendar, which was the most scientific calendar in use at that time. Usage of the new calendar started officially on 1 Chaitra 1879 (date according to the Saka calendar) or 22 March 1957 (date according to the Western calendar).

Despite knowing that a solar-based scientific calendar exists, most Hindus use the lunar-based *panchangam* as their calendar. It has *tithis* for all Hindu festivals, and the date can change depending on the phase of the moon. It also prescribes an inauspicious time everyday—*Rahu kalam*—when no official function can be performed. It also gives the *nakshathram*, the star under which a child is born. Since the horoscope depends on the *nakshathram*, and horoscopes have to be matched before a wedding can be arranged, parents want a favorable *nakshathram* for their child (male of course, because nobody wants a female!). It is ironic that mothers are given a choice for the date of an elective C-section by their gynecologist for the surgery, so that the child can be born with the correct *nakshathram*. Only in India can the modern medical procedure of C-section coexist with the ancient belief in *nakshathrams*.

In the modern inter-connected world, it is necessary to have a common calendar that everyone accepts. This is because we learn in school about the history of different parts of the world, and the dates would not make sense unless we had a common calendar. The currently accepted one is the Gregorian calendar, with an arbitrary (and

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\* Department of Physics, Indian Institute of Science, Bangalore-560012, India, e-mail : [vasant@physics.iisc.ernet.in](mailto:vasant@physics.iisc.ernet.in)

religious) starting point defined by the birth of Jesus Christ. Thus, any year before that is labeled by a number and the letters BC (before christ); any year after that is labeled by a number and the letters AD (*anno domini*, which means *in the year of the Lord*). It is traditional to have BC after the number and AD before the number; thus, the current year is AD 2018. The calendar is also designed not to have a year zero, i.e. the year AD 1 immediately follows the year 1 BC. A terminology that is more neutral and inclusive of non-Christian believers is to label AD as CE (standing for current or common era) and BC as BCE (standing for before the common or current era). In this system, the year numbers are the same, but there is no reference to Christianity.

It is well known from ancient times that the duration of one solar year is slightly more than 365 days. The difference is about one quarter of a day. In order to compensate for this, and bring the year back to the solar cycle, a leap “something” is added to the calendar. In Indian calendars, this is achieved by adding a 13th leap month every 5 years, while the 12 normal months have a duration of 30 days each. In the Gregorian calendar, this is done by having a “leap year” every 4 years. In the leap year, the month of February has 29 days instead of the normal 28 days. This is still a slight over-compensation of the difference, and a correction is applied in the Gregorian calendar for every century year, i.e. year numbers ending in 00. Leap years for the century years are there only if the number is divisible by 400. Thus, 2000 was a leap year but the next one (for the century years) will be in 2400.

The recent statements made by the ruling BJP party reflect a chauvinistic feeling that Hinduism is the greatest religion, and all scientific facts are contained in the *Vedas*. Incorrect statements such as knowledge of plastic surgery was known to ancient *Rishis*, or that Internet and satellites existed at the time of the *Mahabharata* war, or that Stephen Hawking said that the *Vedas* had a theory that is superior to Einstein’s  $E = mc^2$ , start from the PM and percolate downwards. One may be tempted to think that it is a sign-of-the-times, a kind of Modi-effect because BJP is in power. However, a similar feeling that the *Vedas* were infallible was articulated way back in the year 1938 in response to a lecture given by Saha on modern science.

The lecture was an *impromptu* one given to students at Santiniketan at the request of the poet Rabindranath Tagore. It was titled “A new philosophy of life”, and one where Saha showed that equal use of the hand and brain

are needed in the modern age. In fact, he said that the Hindus have lacked innovativeness because of the disconnect between the hands and brain in caste-driven Hindu society—the highest caste was the priestly class of *Brahmins* and one was a *Brahmin* by virtue of being born into a *Brahmin* family independent of any aptitude for priesthood, while artists and craftsmen (people who used their hands) were relegated to lower castes and to which they were consigned by birth. He also took a dig at the *Vedas* by showing that *Vedic* culture was not the most superior compared to other cultures prevalent at that time. The last part irked a lot of Hindus, and their irritation was voiced by Anilbaran Roy—a *Vedic* scholar and philosopher. The criticism was written as a rejoinder to the lecture, and said that Saha was ignorant of the Hindu scriptures and was relying on second-hand sources. Saha’s response was given as a rejoinder to the rejoinder, in which he showed not only that he had read all the *Vedic* texts but also that they were scientifically wrong. For example, the theory of reincarnations of *Vishnu* is inconsistent with Darwin’s theory of evolution. The lecture and the rejoinders are in Bengali, but have been helpfully translated into English by Santimay Chatterjee for the book *Meghnād Rachanā Sankalan* (edited by Santimay Chatterjee, first edition, 1965; second enlarged edition, published by Orient Longman, Calcutta, in 1986, pp. 113–190) under the title “Modern Science and Hindu Religion”.

Saha was deeply concerned with the devastating effect of floods in Indian rivers. He was perhaps influenced by his childhood experience when his native village used to be submerged under the river *Brahmaputra* for a few months every year. He was particularly interested in the *Damodar* river, which used to overflow its banks and flood large areas. He was a member of the Damodar Flood Enquiry Committee, set up by the British government in 1943 to tackle the issue of floods. He suggested the construction of many dams—which could be used for flood control, farm irrigation, and generation of hydroelectric power. This is why Nehru called dams as the “temples of modern India”. His suggestion was to control the fury of the river in a manner similar to the Tennessee Valley Authority in the US. Based on his suggestion, the Damodar Valley Corporation was created in 1948 as the first multi-purpose river-valley project of independent India.

One of Saha’s greatest contributions in influencing science policy in the country was in starting the journal *Science and Culture*, as an Indian equivalent of the British journal *Nature*. He realized that politicians need to listen to scientist’s views, because otherwise they have too much

of a vested interest in getting re-elected. Through articles and editorials in the journal, he expressed his views for the development of the country. He was also involved in the Science Congress, which meets once a year with politicians with the express goal of “advancing and promoting the cause of science in India”. It was founded in the year 1914: a full 20 years before Saha became its president and addressed the gathering. But its importance in modern times has diminished to the point where no

respectable scientist is a part of it, because it has sessions devoted to ridiculous things like “Vedic Science”.

Saha will always be remembered in scientific circles as a person who made seminal contributions to the field of Astrophysics. But he will also be remembered for his tireless efforts at the upliftment of the downtrodden. Saha’s efforts were different from the other scientists of that era, because one normally expects a scientist to do esoteric research in an “ivory tower”. □