

Sister Nivedita's role in J. C. Bose's publications: a historical perspective

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The present work traces the long-standing claim of Sister Nivedita's help to J. C. Bose in preparing his books and journal papers. By unearthing new documents and hence new information, it throws light on Nivedita's education which is vital in discussing her possible role as an assistant or editor of Bose's publications during their association (1898–1911). It also brings to light various contrasting claims made by previous authors on this issue. After discussing the comments of different personalities, including the protagonists themselves and the biographers of both Bose and Nivedita on this issue, this work offers comments about what may be the underlying explanation behind the purported reasons of Bose's non-acknowledgement of Nivedita's help in his works.

The claim that Sister Nivedita (original name: Margaret Elizabeth Noble; 1867–1911) helped J. C. Bose (1858–1937) in preparing his scholarly research papers and books during their period of association (1898–1911) is a long-standing one. Bose does not mention it clearly in any of his writings. Nivedita (1982) talked about her work with Bose in her letters sent to various persons¹. But she is hardly clear about the capacity in which she was helping Bose, i.e. as a co-author, as a transcriber, as an editor, as an assistant, etc. Most of her biographers claim this. However, the same is not for Bose. Most of his biographers do not mention it at all^{2–6}. On the other hand, Dasgupta⁷ mentions it briefly and Devamata⁸ talks about Nivedita's assistance to Bose without going into any detail. Nobel laureate Rabindranath Thakur (Tagore)^{9,10}, a close friend of Bose does not mention it. Still, another set of authors quote other authors to bolster their claim, though somewhat jarringly^{11,12}.

Nivedita's education

Writing the manuscripts of research results of a scientist may call for trained knowledge in research areas of the scientist. However, assisting a scientist in preparing his manuscripts may call for, in general, expertise in the language used for scientific communication and editorial capabilities. This brings to light the importance of a discussion on Nivedita's education. There is confusion about where she received her education. Did she study in a school or in a college? As for Margaret's educational institution, Raymond mentioned both Halifax Col-

lege¹³ and a school at Halifax¹⁴. Mukti-prana^{15,16} did the same. Atmaprana¹⁷ mentioned that she studied at Halifax College. On the other hand, Foxe¹⁸ and Beckerlegge¹⁹ mentioned that she, along with her sister Louisa studied at Congregationalist college at Halifax. Basu²⁰ himself did not say anything about where she studied. However, he provided an oral narration of her sister, where she mentioned as the school of Halifax as their place of study.

However, if we look at the 1881 census record²¹ of England and Wales of Sister Nivedita (then Margaret Noble), we shall immediately understand that she never studied in a college. It may be noted that the 1871 census records have information on her parents (Ref. RG10/3972-117-49), but not on her. Possibly, she was with her relative in Ireland during this time. And in contrast to previous authors' claims, it may be noted that she rather studied in a school and it was an orphan school. She studied at The Crossley Orphan Home and School, Skircoat, Halifax, Yorkshire, England. By the time she attended school, she already lost her father. In case of admission to the Home, the school authority used to give preference to those orphans who lost both of their parents; parents of whom are 'in full communion with a Nonconformist Church' and some other categories of children²². From these conditions of getting admission to this Home, it is clear that though both the sisters did not lose both of their parents, they got the admission to this home because of their departed father's association to the Nonconformist Church. Her father was a Nonconformist minister.

It may be noted here that though by name it was an orphan home and school, each child was required to pay for his/her education. From the School Report (1878), we come to know that with some exception, each family was required to pay ten pounds per year for each child admitted in the school²². Today's Crossley Heath School is steeped into more than four hundred years of a chequered history. It was established by three Crossley brothers, namely Francis, John and Joseph in 1585. The original plan was to establish a 'college' rather than a school and perhaps this explains why most of Nivedita's biographers have mentioned about her attending a college rather than a school²³.

According to the school's admission register (Figure 1) both Margaret and her sister Louisa took admission to the school on the same day, 5 October 1877, when they completed their ninth and eighth birthdays respectively. Their roll numbers in the school were 194 and 195 respectively. At the time of their admission, for both of them, their mother 'Mrs Noble' was shown as their guardian with the address being given as Torrington Devon, Livingstone Terrace, Fleetwood. However, later on, after her marriage, the school register for her sister was overwritten with new information. Under Louisa's name, the word 'married' is added in red colour. In the place for her guardian's name, it was changed to Mr Wilson. Her address was also changed possibly twice: first at 7 Highfield Place, Manningham, Bradford and later at 42 Airville Road, Frizinghall. The school leaving register (Figures 2 and 3) mentions that Margaret left the school on 21

194.	Margaretta E. Noble.	9. Oct. 1876. Oct. 5 th 77.	Mrs Noble.	Livingstone Terrace, Fleetwood.	Livingstone, Devon.	Mother.
195.	Louisa E. Noble. <i>married</i>	8. Aug 8 th 76. Oct. 5 th 77.	Mrs. Wilson 42 Aireville Rd. Highfield Place Horsburghall Bradford			

Figure 1. School admission register page of the Nobles.

194	Noble, Margaretta E.	June 21, 1874	6 3/4 yrs	Excellent abilities, her powers of Composition being extraordinary good. Conduct very good, very truthful & high principled, but somewhat heady & unmethodical. Spent 6 wks in school during last year.	Home address: 47 St. Mary St. Liverpool	Junior Grammar School at Redwick.	Science Certificate: - Botany 2 nd E. Physiology - 2 nd & 1 st Adv. Adv. Phys. Geography - 1 st Elementary. Drawing - 3 rd Grade Certificate. Model being Excellent. Cambridge: Junior (82) III Honors.
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Figure 2. Nivedita's academic record from the school-leaving register.

195	Noble, Minnie Louisa	Dec 22, 1885	8 1/4 yrs	Very truthful and trustworthy girl - much liked by little ones. Very good abilities, Head of School during last 3 months - rather lacking in application	47 St. Mary St. Liverpool	At home.	Science 2 nd E. Botany, 2 nd E. Physiology - 1 st Adv. Physiology, 1 st E. Phys. Geography, 2 nd Adv. Physiology. Cambridge Term: Sat. Div. in R. W. Senior Passed. Drawing - 3 rd Grade.
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Figure 3. Nivedita's sister's academic record from the school-leaving register.

June 1884, and Louisa on 22 December 1885 (ref. 24).

Regarding her school life, we get different comments from Nivedita's biographers. In this regard, perhaps, her sister was most terse in her remarks about Margaret's school days' experiences. At one place, she said that it was a big mistake to send her sister to Halifax school. At another place, she compares her sister's school days with throwing a child in front of a raised dagger of a killing field^{20,25}. However, it may be noted that she was not only a student of this school along with her sister, but also served it later as a teacher as well²⁶.

However, the School Reports (1878, 1884) and recollections by an old student published in the School magazine (1923) tell quite a different tale. The School Report of 1878 mentioned, 'It will doubtless afford genuine satisfaction to the friends of the Institution to learn that many who have been trained within its walls are a joy and comfort to those nearest and dearest to them and give

promise of becoming useful and honoured members of society. Numerous are the letters addressed to the Governors by grateful mothers²⁷. The School Report of 1884 also praised students for their excellent results²⁸. E. R. Wilkinson, a student (1879-88) recounted her experience in the *C. P. S. Magazine* (the school's magazine) in a positive manner²⁹. It may be noted here that this girl studied under both Miss Larratt³⁰ (Reymond mentioned the spelling as Larrett) and Miss Collins³¹ under whom Sister Nivedita also studied.

Reymond did not mention clearly about the subjects Nivedita studied at the school. At one place, she said that in the second year of Margaret's study at the school, the then headmistress Miss Collins used to teach botany, physics and some basic ideas of mechanics, but Margaret was very interested in literature³⁰. Regarding her education, Atmaprana³² mentioned that in the school she 'developed an interest in music, art, and the natural sciences'. Muktiprana³³ writes

that during her school days, she developed an interest in music and arts along with literature. She adds that Margaret also took a deep interest in physics and botany. On the other hand, both Foxe (1975) and Basu (1990) do not mention anything in this regard.

About the subjects taught at that time to the students, the School Report of 1878 mentions that 'In addition to usual branches of an English Education, those children who show capacity for such studies are taught Latin, French, Book-keeping, Composition, Animal Physiology, Physical Geography, Drawing, English Literature, Mensuration, Algebra, and Euclid. The Girls are also taught Needlework and such departments of household services as are likely to prove useful to them in after life²².

Margaret and her sister Louisa spent 6 3/4 and 8 1/4 years in the school respectively. Her record in the school leaving register (Figure 2) gives us detailed information about the subjects she studied there along with her results. Among

science certificates, she studied botany, physiology and physiography. She also learnt drawing. She received the second elementary course in botany, a first and second advanced course in physiology and first elementary course in physiography. In drawing, she received three first-grade certificates. Her models in drawing were 'excellent'. She also cleared junior Cambridge examination (1882) with III honours.

On the other hand, from the school leaving register of her sister (Figure 3), we come to know that she also studied botany, physiology and physiography. However, Louisa also studied advanced physiography, which her more illustrious sister did not. She also received the same grade certificates in drawing like her sister. Another difference is that while Margaret cleared only junior Cambridge examination, Louisa passed the Senior examination as well.

The school leaving registers for both the sisters also described their characteristic traits. About Margaret (Figure 2), it says: 'Excellent abilities, her power of composition being extraordinarily good. Conduct very good, very truthful and high principled, but somewhat untidy and unmethodical, Second girl in school during last year.'

About Louisa it notes (Figure 3): 'Very truthful and trustworthy girl – much liked by little ones. Very good abilities, "Head of school" during last 3 months – rather wanting in application' (i.e. she did not get on things).

Bose's publications

Bose's publications may be divided into three distinct phases: 1895–1901, 1901–1902 and 1902–1927. Bose's first research paper was published in 1895 in the *Journal of the Asiatic Society of Bengal*. It discussed his experiment of producing small (wavelength of 5 mm) electromagnetic waves. In that year, he published three more papers. Amongst these, one article was published in *Proceedings of the Royal Society A*, and the rest two were published in *The Electrician*. These two articles reported results following his earlier line of research. In 1897, among others, between January and November, Bose published three crucial research papers. In the first paper ('On the selective conductivity exhibited by certain polarising substances'), Bose

discussed selective conductivity of crystals like tourmaline. It was published in the *Proceedings of the Royal Society A*. The next two papers were also published in the same journal. The second paper was on the determination of refraction index of glass. Through the experiment described in the third paper, Bose opened a new way of determining the refraction index and wavelength. It may be noted here that he did not discuss the theoretical underpinnings of this experiment, though there was scope for it here. He only described the procedure of the experiment and the subsequent results of it. In the next few papers, Bose focused on the similarities in the characteristics of the wavelength of visible light and invisible electromagnetic waves.

Sometime before 1900, Bose shifted his attention to new research areas. During this time, he conducted several experiments to understand the atomic and physical changes in matter due to the transportation of electromagnetic waves through it. In 1900, he published a paper on this in *Proceedings of the Royal Society A*. We may say this paper bears the testimony of the change in his direction of research.

Bose published seven research papers during 1900–1901. Except for the paper presented at the Science of Congress (1900) held at Paris, the other six papers were on experimental physics. This period may be called the transition period of Bose's research. In May 1901, he presented a paper entitled 'The response of inorganic matter to mechanical and electrical stimulus' at the Royal Institution. The topic of this paper shows the direction of change in his research.

Between 1902 and 1925, Bose published nine papers. Amongst these, barring one, all the other papers dealt with the physiological aspects of plants and animals, specially plants. Some of these papers discussed the growth of plants. Few of them discussed instruments he developed to measure the response of plants towards external stimulation. In the true sense of the term, these papers do not deal with physical science. He wrote 12 books between 1902 and 1931; these included *Life Movements in Plants* (in five volumes). Except, *Collected Physical Papers* (1928), all the other 11 books dealt with the physiological aspects of plants.

We already mentioned that in the third and final phase (1902–1927) Bose main-

ly wrote on physiological aspects of plants in his research papers. He did not publish any research papers from 1902 till 1912. During this period, he wrote two books: *Plant Response as a Means of Physiological Investigation*, and *Comparative Electro-physiology: A Physico-physiological Study*. Perhaps these two books made him the first of our country and one of the forerunner biophysicists of the world. He tried to measure the biological processes taking the cue from his other self as a physicist.

His last paper in an international journal was published in the *Proceedings of the Royal Society B* (1925). We notice, from 1918, he started to publish most of his research papers in his Bose Institute publication: *Transactions of the Bose Research Institute*. Between 1918 and 1921, he published *Life Movements in Plants* in five volumes. In 1923, he published *Physiology of the Ascent of Sap*. Then he published *The Physiology of Photosynthesis* (1924), *The Nervous Mechanisms of Plants* (1926) and others. *Growth and Tropic Movements of Plants* (1929) was his last published book³⁴.

Nivedita's remarks

Nivedita met Bose in 1898 (letter to Tagore on 18 April 1903). The primary source of Nivedita's comments on her help to Bose in his writings is her letters written to several personalities¹. Nivedita mentions about her help or assistance or association with Bose's works in about 29 letters she wrote to various persons. Amongst these, maximum letters were written to Miss J. MacLeod, 14 in number. Mrs Ole Bull received 12 letters. In two letters, we do not find the recipient's name. Another letter was sent to Miss. Alice M. Longfellow, daughter of the famous American poet Henry Wadsworth Longfellow (1807–1882). Miss Longfellow was Mrs Bull's sister-in-law.

Nivedita wrote the first letter in this regard on 3 October 1900 to Mrs Ole Bull (Letter Number 790, part of Addendum). In this letter, she talks about noting down the chain of thoughts that came to Bose's mind so that they do not get lost. She claimed that she did because Bose was afraid of losing those chains of thoughts. She also talked about making a list of six new papers. She is sure that these papers are going to verify 'the Vedanta doctrine of Unity for many

departments of Physical science – one of the greatest generalisations of the century.’ She adds that they have worked out the ‘headings’ of one of the paper.

On 17 December 1903 (Letter Number 260), she expressed her jubilation to Mrs Ole Bull about Bose’s ideas for a new book. However, she added that for the time being though they are engaged in completing some other paper. Letter Number 273 was also sent to Mrs Ole Bull. Nivedita wrote this letter on 10 February 1904. While calling Bose’s way of thinking as ‘appalling white heat of thought’, Nivedita claims that Bose had given her ‘four sheets of notes’ in a hurry and instructed her to write papers based on them from tomorrow.

Letter Number 279 is an important letter. Nivedita wrote this letter on 17 March 1904. It is crucial in the sense that, perhaps only in this letter, Nivedita mentions her work with Bose is ‘scientific secretarial work’. In her letter to Miss J. MacLeod on 21 July 1904, Nivedita expressed her joy at the acceptance of Bose’s paper by *Philosophical Transactions of the Royal Society*. However, it may be noted that none of Bose’s papers was published in this journal during this period. Bose had published a paper in this journal in 1914. She says that now they are eager to complete the book on botany so that they can return to physics soon.

The next letter that we find in this regard is of 28 July 1904 (Letter Number 299). In essence, this letter is a continuation of the previous letter. This letter was also sent to Miss J. MacLeod. While feeling very excited about the prospect of a publication in *Philosophical Transactions* which she calls *Vedas* for the English people, after researching for three years, she is also very hopeful about publication of a book of Bose by 1904. She says that it will complete the ‘vegetable detour – 3½ years of work to include a whole science in his synthesis of Fundamental Unity’. She finished by adding that now they are engaged in revising the whole thing and Miss MacLeod may laugh at the small handwriting of Nivedita.

In the letter written on 21 September 1904 (Letter Number 309) she claims that for the last one year they (She and Bose) were writing ‘bombshell’. She added that though they slowed down their writing lately, they will pick up speed again. She hoped that they would be able to complete a book in two years. It is important to note that throughout the

letter, she used the word ‘we’ for writer(s) of the books and journal articles. The next three letters (Letter Numbers 341, 351 and 352; date: mentioned as Thursday Easter Week for the first letter, but S. P. Basu mentions the date as 12 April 1905 in *Nivedita Lokmata* and 21 June 1905 for both the second and third letters) are on the same theme. She sent the first two letters to Miss J. MacLeod and the last one to Mrs Ole Bull. In these letters, she talked about their work on a book on botany that ‘ought to be very astonishing to the scientific world’.

The letter she wrote on 20 July 1905 (Letter Number 357; recipient unknown) is also essential to understand their relationship in terms of Nivedita’s help to Bose in his writings. Here she acknowledges that her task is to do her job and ‘not to scrutinise the why and wherefore and hereafter’. However, she did not mention her exact role. In the next series of letters (five in total; letter numbers 363, 364, 371, 375 and 378) she informed Mrs Ole Bull (three letters; on 17 August 1905, 24 August 1905 and 31 October 1905 respectively) and Miss J. MacLeod (two letters; on 22 November 1905 and 06 December 1905 respectively) about ‘their’ work in writing a book on botany. However, interestingly, in Letter Number 371 (31 October 1905), she wrote that Bose ‘thinks that between May and October next he will write another book-on the Electro-Physiology of Plants’ [sic].

Letter Number 401 is an interesting one. Nivedita wrote this letter to Mrs Bull on 2 May 1906. Here she informed Mrs Bull that Bose ‘exiled’ her to prepare himself to start writing his new book. There is a long-standing criticism of Bose about his reluctance to cite previous authors. Nivedita touched upon this issue in her letter written on 17 May 1906 (Letter Number 403; recipient unknown). From her letter, it is clear that they were well aware of the fact that there will be an outcry because of non-citation of previous authors. But, Nivedita mentioned here that ‘we decided on that deliberately’. From the letter, it also comes to light that Nivedita may have given her suggestion favouring this (non-citation) to Bose. She adds that Bose ‘says he is just a single handed worker’. Here Nivedita also mentioned about Vines’ (1849–1934) criticism of Bose’s book. She said that ‘they’ shall have to answer the criticisms made by Vines.

On 29 August 1906, Nivedita wrote another letter (Letter Number 419) to Miss MacLeod to inform her that ‘they’ are currently busy in writing the book *Plant Response as a Means of Physiological Investigation*. She adds that she feels suffocated to do her share in this job. Her next three letters (Letter numbers 441, 451 and 452) to Miss MacLeod (first two) and Mrs Bull (on 27 February 1907, 24 April 1907 and 24 April 1907 respectively) talked about preparation and publication of Bose’s next book (*Comparative Electro-physiology: A Physico-physiological Study*). In Letter Number 441, she mentioned that Bose wanted to complete this book before May of the year, so that it may be published in 12 years from his first publication. However, in the next two letters (Letter numbers 451 and 452), she said that ‘we’ are working on finishing the book. She added that what Bose sees as a contribution on ‘Molecular theory’, she found an ‘aspect of the Divinity appearing in triumphant incarnation as a great Physicist’ in it.

Nivedita mentioned about her association with Bose about helping him in his works in another three letters. These were written on 4 July 1911 (Letter Number 757), 16 August 1911 (Letter Number 766) and 5 September 1911 (Letter Number 772) respectively. The first two letters were written to Miss MacLeod and the last one to Miss Alice M. Longfellow. In the first letter, she mentioned that ‘we did 12 chapters of a new book’ at Mayavati which is ‘the stiffest he has yet written’. She hastened to add that she was not sure whether her writing for this book is ‘heroic’ or not. She wished that it may be so. In the next letter, she informed Miss MacLeod that she wanted ‘the Bairns to help through one more phase in science’. In the next letter to Miss Longfellow, she told her that she and Bose are ‘working on a new book on science’. She adds that the book is full of ‘highly technical and world-shaking chapters’.

Bose’s remarks

In contrast to Nivedita’s comments on her help to Bose in preparing his works, Bose’s remarks in this regard are very few and far between. In his letter to Mrs Bull (Letter Number 48, Appendix 1905; 21 June 1905?), Bose informed her that

'We have done $\frac{3}{4}$ th of the work'. In another letter (Letter Number 52 on 16 October 1905) to Mrs Bull, he told her that Nivedita is packing the manuscript. In a letter to Thakur³⁵ (20 July 1901), Bose informed him that he has 'an English Assistant'. He added that she came as a novice. But now she has a glowing face with interest. Evidently, Bose mentioned all these about Nivedita. We find another two letters written to Thakur where Bose mentioned about his books (dates: 18 July 1902 and 7 July 1907). But he did not mention anything about Nivedita in these letters.

On the contrary, in both these letters, he mentioned he is busy with either proofreading his books or writing his books along with proofreading his books. So the confusion remains. On the one hand, as mentioned above, Nivedita is claiming to be 'writing' or 'working' with Bose's book(s), on the other Bose himself is proclaiming about writing his books. Perhaps the only letter where Bose mentioned about Nivedita's help in his writing was written by him on 2 November 1911 (Letter Number 79; Appendix 1911). Basu published this letter in his book. Bose wrote this letter to Nivedita's sister, Mrs Wilson after her demise in Darjeeling. Bose noted '... And then the book which she was helping me to write is staring me in the face. I have not at present the strength to do anything with it.'

Rabindranath's comments

Thakur and Bose were close friends. Their friendship existed until the demise of Bose in 1937. Apart from the missing ones, we found the existence of 124 letters which were exchanged between them. Amongst them, Bose wrote 88 and Thakur wrote 36 letters to each other. However, we do not find any explicit mention of Nivedita's help in Bose's writings in any of Thakur's letters. Only in his obituary on Bose, Thakur mentioned Nivedita as 'inspiress' in Bose's life and works. He added that Nivedita should be remembered with reverence while discussing Bose's life¹⁰. However, interestingly, while writing Nivedita's obituary, Thakur, did not mention her relationship with Bose at all⁹. Arguably, two of the best biographies of Thakur were written by Mukhopadhyay³⁶ and Pal³⁷. Mukhopadhyay dealt with both Bose and Nivedita at length in his four-

volume book. He did not mention anything about Nivedita's help to J. C. Bose in writing his manuscripts. He has only one line to offer in this regard: Everyone aware of the life and works of Jagadishchandra, knows that he was very much grateful to Nivedita³⁸. On the other hand, without providing any specific reference, Pal mentioned about Nivedita's help in a single line: During 1901–1902, Nivedita started to help Bose in writing his scientific articles³⁹. On the other hand, Rathindranath Thakur (1888–1961), eldest son of Rabindranath, was a witness to the close relationship between his father and Bose. He discussed this relation in his memoir *Pitrismruti* (= In Memory of My Father). While he was a student at the University of Illinois, USA (1908), he organized and assisted Bose in delivering a lecture in his University. However, he did not mention the relation between Bose and Nivedita in this book⁴⁰.

Others' comments

We also find that many persons like Mrs Bull, Sister Christine, etc. who were in some way or the other attached to either to Bose and Nivedita or both also commented on this issue in their letters to others¹. Mrs Bull wrote the first of this kind of letter that we find to Nivedita on 12 June 1905. This letter (Letter Number 45) is included in the Appendix of 1905 in the collection of Nivedita's letters. Here Mrs Bull calls Nivedita as the 'Secretary' of Bose and tells her that she brings her 'trained efficiency' while helping Bose in his works. Mrs Bull wrote a vital letter to Bose also on the same day (Letter Number 46, Appendix 1905). Here she mentioned that the 'secretary [Sister Nivedita] is fortunate to follow all without the laboratory work'. So she agreed that Nivedita did not have any role in the experiments done by Bose. Then she talked about safeguarding Bose's papers if he accidentally dies. She is sure that as the 'Secretary' has gone over his papers already, then she will be able to understand those in that situation as well. She also advises him to make her as the 'literary executor' in case of any untoward accident in his life. In this letter, she even goaded him to acknowledge her as his 'co-worker'. She also added that Nivedita should have the opportunity to earn in case of 'actual manual work'.

In her letter on 31 July 1907 (Letter Number 63, Appendix 1907), Sister Christine informed Gokhale (1866–1915) that the 'two literary ones' (Bose and Nivedita) 'are finishing their books'. However, from this statement, it is not easy to comment whether Christine wanted to mean that Nivedita was assisting Bose in writing his book or not. Both of them published books during this time. Bose and Nivedita published their books *Comparative Electro-physiology: A Physico-physiological Study* and *Cradle Tales of Hinduism* in 1907 respectively.

Sister Christine wrote another letter that we found in this respect to Miss MacLeod on 21 March 1913. Here she informed Miss. MacLeod that Nivedita was the person who understood Bose completely, helped in his work, and inspired him in his life. She felt that Nivedita's death had created a void in Bose's life. Interestingly, in the letter that Nivedita wrote to Thakur (Tagore) on 18 April 1903, she mentioned about her meeting with Bose 'in the end of the year 1898', but she did not utter a single word about their joint effort in preparing the scientific output of Bose. However, it is interesting to note that her brother did not mention this aspect of his sister's life in his obituary published in *Modern Review*⁴¹. Sen⁴² (1994), while commenting on Bose's letter to Thakur (Tagore) on 18 April 1900, called Nivedita as an inspirer of Bose in his works.

Nivedita's Biographers' comments

Lizelle Reymond (1899–1994) wrote the first biography of Nivedita, *Fille de l'Inde* in 1946 (ref. 43). It was originally published in French. The publisher, Victor Attinger published it from both Paris and Neuchâtel. The preface was written by Visvabandhu Sastri (1897–1973). The English translation of this book was published in 1953. This was published by The John Day Company from New York, USA. There is no explicit mention of the translator's name in the English version. The verso of the title page carries the following information only: 'Translated from the French. The author acknowledges gratefully the aid of Katherine Woods in revising and preparing this book for American publication'¹³. Jean Herbert (1897–1980) wrote the preface of this version. It may be noted that by

birth Herbert was a French national and he was one of the first interpreters at the United Nations⁴⁴. Umachal Prakashani, Kolkata published the Bengali translation of this book in 1362 (B.S.) (=1955). Narayani Devi translated it into Bengali. Srimat Anirban wrote the preface of this version. From the translator's forward, we come to know that Reymond requested her to translate the book in Bengali⁴⁵.

It may be noted the chapters in the original French version were not numbered. But the chapters are numbered both in English and Bengali versions. Translators had taken their freedom in translating the titles from original French to both English and Bengali. Though previously in three chapters (English version) the author obliquely touched upon the issue of Nivedita's help towards Bose, it is Chapter 40 which discussed it in detail. In Chapter 21 under the title Brahmo-Samaj Friendships (English version), the author quoted Nivedita (without reference) that she is very eager to help Bose in writing down his ideas which the author fails to note down by saying 'How do you expect me to seize on the idea that passes like a flash? It eludes me'⁴⁶. In Chapters 33 and 36 (English version) the author informed that Nivedita granted Bose 'a large place in her active existence'⁴⁷ and 'given a good deal of her time'⁴⁸. The author made these comments basing on the incidents in Bose's life in 1903.

However, the Chapters Vie intérieure (French version), Interlude (Chapter 40, English version) and (Chapter Biskambhak = incidents behind the scene, Bengali version) discuss this aspect in detail. The intriguing fact is that there are a lot of differences amongst these three available versions of the same title. We need to remember here that the English and Bengali versions were translations of the original version written in French. But we find many sentences in the both English and Bengali versions which were not there in the original French version at all. The Bengali version carries this sentence, 'Jagadish Chandra tanr maner bhabgular khasra ekta kagaje likhe rekhe jeten. Paradin ese dekhten segulo jahajatha lipibaddha haye rayechhe' (=Jagadishchandra used to note down his thoughts in a piece of paper. Next day he used to find his ideas expressed with right words)⁴⁹. However, interestingly, we do not see this sentence either in the original French or in the English version.

In another instance, we find that the translator(s) were not true to the original writing in French.

French version: 'Dès que les vacances arrivaient, c'était la fuite vers la montagne, à Darjeeling ou Mayavati pour travailler à un rythme accéléré. Nivedita l'accompagnait. Les comptes rendus des expériences positives étaient triés, analysés. Nivedita les rédigeait. L'œuvre magistrale prenait forme. Bose s'absorbait dans ses recherches cinq, six heures par jour, puis fatigué s'épanchait volontiers en d'épiques querelles avec Nivedita'. (=As soon as the holidays arrived, it was the flight to the mountains, Darjeeling or Mayavati to work at an accelerated pace. Nivedita was with him. Reports of positive experiences were sorted and analysed. Nivedita wrote them. The masterpiece took shape. Bose was absorbed in his research works for five to six hours a day and then got tired after free flowing epic quarrels with Nivedita)⁵⁰.

English version: No such sentences are available.

Bengali version: 'Erpar chhutite dujane Mayavati giye panch-chhay ghanta khatte suru karlen' (=Then both of them went to Mayavati and started to work for five-six hours a day)⁴⁹.

Still in another instance in this chapter, we find that some sentences are not available in the English version, while the Bengali translator selectively skipped some in-between sentences which were in the original French version.

French version: '...Je déchire le chapitre que vous venez d'écrire, il trahit ma pensée, lui disait-il.

– Si vous le faites, je m'en vais ! J'ai ramené votre pensée au squelette de l'idée. Vous avez peur des mots!

– Donnez-moi les mots corrects, oui, mais rien que les mots! Laissez-moi l'idée. Je la revendique!⁵¹

(= '... I rip the chapter you just wrote. It betrays my thoughts, he said.

– If you do, I go! I brought your thinking to the skeleton of the idea. You're afraid of words!

– Give me the right words, yes, but only the words! Leave me the idea. I claim!)

English version: No such sentences are available

Bengali version: 'Je adhyayta likhechen ota chhinre phelba ami. Amar bhabanar dhara orakam noy'. (=I will tear down the chapter you wrote. It is not

going correctly with my way of thinking).

'Ta jodi karo to ami challam. Ami kebal tomari chintagulo jathasambhab sahaj kathay bibrita karechhi. Kathakei tomar bhay.' (=I will leave, if you do that. I always try to write down your thoughts in simplest possible language. You are afraid of words!)

'Jutsoi katha chai, ekebare thik lagsai ... ar kichhu na.' (=I require proper words, just exact words ... only that)⁵².

If we take a critical look at the above quotations, we shall find that the Bengali translator has translated the third sentence selectively. From the original French version we can see that Bose is asking Nivedita, almost beratingly that she needs to help him only by providing the 'right words' but she should keep herself away from the 'ideas'. The Bengali translator skipped this important part. The reason for doing this is not clear, though. From this, it may be noted (according to Reymond) that Bose was having some reservations about the way Nivedita was helping him in writing his manuscripts. It may also be noted here that in her letters she often mentioned about 'verifying the Vedanta doctrine of Unity for many departments of Physical Science – one of the greatest generalisations of the century' (Letter Number 790 Addendum; date: 3 October 1900; to Mrs Bull); 'whole science in his synthesis of Fundamental Unity' (Letter Number 299; Date: 28 July 1904; to Miss MacLeod); 'Science of Botany was revolutionised by a Hindu!' (Letter Number 375; date: 22 November 1905; to Miss MacLeod), 'the whole thing awes me with its aspect of the Divinity appearing in triumphant incarnation as a great Physicist' (Letter Number 452; date: 24 April 1907; to Mrs Bull). Was this the reason for which Bose 'exiled' Nivedita for 'thinking long' to prepare himself for a new book? (Nivedita's letter to Mrs Bull; Letter Number 401; date: 2 May 1906).

However, from the above quotations, it may seem that the Bengali translator has tried to translate from the original French version. However, interesting it may seem, but the fact is there are instances where we find some lines in the Bengali version which are not available in the original French version but available in the English version.

English version: 'They had actually written the book, Plant Response, together.'⁵³

Bengali version: Bengali translated version of the above English sentence is available⁴⁹.

French version: Not available.

It brings confusions and questions. It begs the question about which version did the Bengali translator follow for translating it into Bengali. The Bengali translator claimed that she did it from the original French⁵⁴. She also claimed that Srimat Anirban who wrote the preface of the Bengali translated version checked the Bengali translated version with the original French version. It may also be noted she also changed the titles of some chapters. It is not a question of a mere change in the title with keeping the underlying meaning the same. It is a change in the title whereby the primary essence of the chapter has been changed. The title of Chapter 33 was 'The New Life'. The Bengali translator turned it into 'Khoka o Christin' (=Bose and Christin). Likewise, the title of Chapter 36 was 'Dynamic Religion and United India' in the English version. However, in the Bengali version, it became 'Vidyalye' (=In School). Another level of change is found in missing paragraphs. This happened for both the English and French versions. The first paragraph of the English version of Chapter 33 is missing in the Bengali version. Several paragraphs of the original French version are missing from the Bengali translation. This is concerning the Chapter 'Vie intérieure' (French version) and its equivalent chapter 40 of the Bengali version. Still another level of change is in numbering of the paragraphs. Until Chapter 38, the Bengali translator almost followed the same pattern (barring changes as mentioned earlier) of the English translation. However, from Chapter 39, this did not remain same. Chapter 40 of the English version has become Chapter 39 (Biskambhak = incidents behind the scene) in the Bengali version. However, it is clear that the biographer mentioned about Nivedita's help in preparing the manuscripts of Bose's book in this chapter.

The second book where we find mention of Nivedita's help towards Bose in preparing his book is *Days in an Indian Monastery* by Sister Devamata. She mentioned 'Literary work absorbed Sister Nivedita too profoundly to enable her to take part to any extent in teaching. She was occupied also in assisting the famous botanist, Dr J. C. Bose, in preparing

a new book on plant life. He spent several hours every day at the school and sometimes launched there, so, I had a delightful opportunity to know him.'⁵⁸

Pravrajika Mukti-prana wrote Nivedita's biography in Bengali. According to her, after Nivedita understood that the rule of the English in India would certainly work as the stumbling block in Bose's research, she took it as her personal duty to help Bose in his research and help him to get a proper footing in the scientific community of the world⁵⁵. According to Mukti-prana, Nivedita performed it throughout her life. The author mentioned that immediately after Bose's return to India in the October 1902 until 1911, Nivedita was engaged in helping him wholeheartedly in his research. She claimed Bose's famous book *Plant Response* and other later books do carry Nivedita's 'writing style' (=lipichaturya)⁵⁶. She noted that during July 1905, she was engaged in writing Bose's book *Plant Response as a Means of Physiological Investigation* (1906)⁵⁷.

Contrary to what Mukti-prana says earlier, at another place, the author mentioned that Nivedita started to help Bose in his research from 1901 when he was staying in England⁵⁵. The author claimed that Nivedita edited *Response in the Living and Non-living* (1902), *Plant Response as a Means of Physiological Investigation* (1906), *Comparative Electrophysiology* (1907), *Researches on Irritability of Plants* (1913) and many other articles of Bose that were later published in the *Philosophical Transactions of the Royal Society*. She adds that it was not enough to say that she just edited his books and articles⁵⁸. Instead, the author claimed that Nivedita's excellent command over the English language helped her to 'write' (=pranayane) these books and articles⁵⁹. She mentioned that 40 chapters of *Comparative Electrophysiology* (1907) were written within only ten months⁶⁰. While quoting Devamata (1975), Mukti-prana wrote, 'it took lot of time for Nivedita to help Bose to write his book'⁵⁹. However, this part is missing in the original writing by Devamata. To buttress her point, the author quoted Thakur's (Tagore) obituary on Bose (Thakur 1937; 1344 B. S.): '...Nivedita was an inspireress in his work and writings. She needs to receive an important position in his biography'⁶¹. The author quoted Sister Christine's letter (mentioned earlier) to Miss J. MacLeod on 21

March 1913 to reiterate her claim that she helped Bose in his work. She quoted from Nivedita's diary (31 December 1907): 'What a wonderful year! It all started at Dum Dum – ends at London. Two book have come out – *Comparative Electrophysiology* and *Cradle Tales of Hinduism*. Work is on for other books – ... *Modern Review* and *Prabuddha Bharat* – an incredible year it is! Mother! Mother! Mother! Let Swamiji receives it'⁶².

Pravrajika Atmaprana's⁶³ biography of Nivedita was first published in 1961. According to her, Nivedita 'edited Dr J. C. Bose's book *The living and the Non-Living*' (*Response in the Living and Non-living*)⁶⁴. Without quoting any specific reference, she noted that 'On May 17, in Mayavati, Dr Bose began writing his famous book, *Plant Response*, and on June 23, they returned to Calcutta.'⁶⁵ She did not make any specific mention of Nivedita's help to write the book here. However, at another place, she mentioned that 'Nivedita had practically prepared the complete manuscript of his book *Plant Response*.' She also added that 'Since her return to India in 1902 till 1911 she was constantly helping Dr Bose in writing his research books.' She continued by saying that 'Dr Bose either came to 17 Bosepara Lane or Nivedita went to 93 Circular Road while they worked together on his books.'⁶⁶ According to her, Nivedita 'also helped Dr Bose in writing his book *Comparative electro-Physiology*.'⁶⁷ Like Mukti-prana, she also quoted the same lines from Nivedita's diary. However, there are some differences in their quotations. Both use quotation marks for it. Yet the terms '*Modern Review* and *Prabuddha Bharat*' are missing from Atmaprana's quotation. Atmaprana did not mention 'Let Swamiji receives it' with this quotation⁶⁸.

Without citing any specific reference, she asserted that 'From 1902 onwards Nivedita engaged herself in revising and editing Dr Bose's written work. From her personal notes and letters we come to know that between 1902 and 1907 she helped him in writing the following books: *Living and the Non-Living*, *Plant Response* and *Comparative Electro-Physiology*. She also helped him in his book *Irritability of Plants*, which was published later. Besides, she revised his miscellaneous papers regularly published in the *Philosophical Transaction*, a journal of the Royal Society.' She also added

that 'Dr Bose came to 17 Bosepara Lane every day and the writing work went on.'⁶⁹ She quoted Sister Devamata's comments on Nivedita's help to Bose to 'prepare' his book⁷⁰. Like Muktiprana, she also quoted Sister Christine's letter and Thakur's comments on Nivedita to underscore her point that Nivedita helped Bose in his works⁷⁰. According to her, in 1911, during their one month stay at Mawavati 'she helped Dr Bose with his new book.'⁷¹ The author's last comment about Nivedita's help to Bose (1911) in writing his books is: 'Anyhow, Nivedita returned to Calcutta from Mayavati in June. She found no respite from school work, her writings and Dr Bose's work.'⁷²

Foxe⁷³ followed Atmaprana in writing her biography of Nivedita. According to her, Nivedita 'edited Dr Bose's *The Living and Non-Living*' in November (1901)⁷⁴. At another place, she noted that Nivedita 'helped Dr Bose in writing his book *Comparative Electro-Physiology*'⁷⁵. Foxe goes on to add that 'Bose himself, ... turned to her with increasing trust for help in his work; ... and from the moment in 1902 when she came to believe that some British scientists were belittling him and ruining his work, she began to revise and edit his books with him and help him in every way possible. He came to Bosepara Lane frequently, and she worked there on his books with him. The results were seen in his books *Living and Non-Living*, *Comparative Electro-Physiology* and *Irritability of Plants*'⁷⁶. Like Muktiprana and Atmaprana, she also quoted the same part from Nivedita's diary (31 December 1907)⁷⁷.

Contrary to Basu, Nandy⁷⁸ and Sen Gupta¹² (we shall see later), Foxe mentioned that Nivedita 'did not claim to know very much' about science 'and so accepted Dr Bose's theories and research without too much query'⁷⁹. According to Foxe, Nivedita's 'devotion to science and scientists was tempered by an admission that she herself was no scientist'⁸⁰. At another place also she mentioned that Nivedita '...was no scientist, she did not attempt to control his scientific research'⁸¹. Foxe called Nivedita's help to Bose in his work as 'inestimable'. Without citing any specific source, Foxe wrote that Bose 'acknowledged it [her help] fully'. Foxe accepted the fact that 'it is impossible to judge' 'How far she influenced his thinking during her constant work with him on his books.' But she claimed, again without mentioning

any specific source that as a result of Nivedita's influence on him, Bose 'tended, as years passed, to move from pure physics to metaphysics, from pure botany to a Vedantic sense of the oneness of all life which has caused him to be accused by some of anthropomorphism. India and Kali became almost a cult in his approach to science'⁸⁰. She also added that 'in science, as in art, there was always the danger of a possible loss of objectivity in Nivedita's highly specialized nationalistic approach'⁸². She quoted Nivedita to support her claim - 'Art, like science, like education, like industry itself, must now be followed "for the remaking of the Motherland" and for no other aim.' Like her other biographers, she also mentioned that Nivedita helped Bose to write his book when they were at Mayavati and even at Calcutta (1911)⁸².

Sankari Prasad Basu's biography of Nivedita was published in 1990. It is in four volumes, and the volume one was divided into two parts. Primarily, part two of volume one discussed Bose's relation with Nivedita. According to him, Jagadishchandra did not acknowledge explicitly the help rendered by Nivedita in writing his second book (*Plant Response as a means of Physiological Investigation*) from his deep sense of gratitude towards her⁸³. Had he done that he would have been discredited like a liar. He added every page of this book bears the testimony of Nivedita's help in writing it. He claimed that this book is as much of Jagadish Chandra's as it is of Nivedita's, at least from sentiment.

Nivedita called this (and other books) book as 'our book'. He added that the discovery part is of Jagadishchandra's; but Nivedita played the role of an inspirer and writer. He added that she drew most of the figures of the book and took leading role in its publication. According to him, she also played a prominent role in publicising the book as well. According to Basu, she was engaged in many other activities during the preparation of this book. He also claimed that even if someone is having only minimal information regarding her vast array of activities, he will be able to understand that what a monumental work she did in ten years by taking the significant role in writing and preparing the drawings of Jagadishchandra's first four books and several papers along with her other works! He emphasised that to understand this, no one is required to calculate any

other data - the number of pages and figures of these four books are around 2500 and around 1000 respectively. Basu mentioned that a person like Nivedita who was always devoted to her duty was not in the nature of helping one and claiming credit for the same openly. Basu argued that in reality, this saved the Indian science from being ashamed in giving credit in the publication of Bose's books⁸⁴.

In the footnote, the author clarified that Nivedita's help is most visible in *Plant Response as a means of Physiological Investigation* and *Comparative Electro-Physiology*. But he did not mention any source to support his claim⁸³. Another important point is about drawing the figures in Bose's books. Basu said that Nivedita drew around 1000 figures in Bose's different books. However, he published a letter in this book where Bose noted that 'The great difficulty is in having illustrations as I can't get anyone who can do the illustrations. I have to get these down slowly by some of my artist friends' (Letter to Mrs Bull; Date: 13 April 1904). From this, it is not clear whether Bose considered Nivedita as an artist friend. Basu presented the Bengali translation of Abala Bose's write up on Sister Nivedita published in *Modern Review*. However, nowhere in this writing, did she ever mention of Nivedita's help in her husband's works. At one place in this write-up, she said that she was privy to how the famous philosophers, religious leaders, politicians, social workers, etc. praised and showed their respect to her for her clear thinking, intelligence, personality. Taking a cue from this comment, Basu conjectured that as Nivedita was involved in Bose's research and as she took prime responsibility to write his discoveries in books, Nivedita must have developed some connections with the scientific community. He adds that Nivedita also fought vigorously for proper recognition of Bose's findings. He also claims that had Nivedita not been endowed with a sharp scientific bent of mind, it would not have been possible for her to write down Bose's thoughts and discoveries⁸⁵.

In volume two of the same book, Basu claimed that many people who tend to bracket Nivedita only as a religious worker or also someone who was also interested in India's national movements, intentionally or unintentionally tend to forget that Nivedita played the foremost

role in Bose's scientific researches⁸⁶. In this volume, at another place, he mentioned that Nivedita helped Bose in writing his books. Now, the fact is, there are a lot of differences between writing Bose's books and helping Bose to write books. We find that kind of reference for Radhakumud Mukhopadhyay. Basu mentioned that Nivedita 'revised the total manuscript' of Mukhopadhyay's book *Indian Shipping*⁸⁷. Still at another place, without providing specific reference(s), Basu mentioned that Ramananda Chattopadhyay (1865–1943) rued the fact that people are becoming oblivious about Nivedita's key role in Bose's scientific researches and he tried to remind everyone about that repeatedly⁸⁸.

Bose's biographers' comments

In stark contrast to Nivedita's biographers, most of Bose's biographers did not give much importance to it. Geddes² was the first and authorized biographer of Bose. He did not mention it at all. Home⁴ also did not offer any comment on this. Bhattacharyya and Engineer⁶ have nothing to say in this regard. Arguably, one of the best biographies on Bose⁵ also did not mention it. One of the recent-day biographies of Bose mentioned her as his 'editorial assistant'⁸⁹. Dasgupta was not sure about the adequacy of her scientific background to understand Bose's research. Instead, the author directly blamed her for feeding wrong information to Thakur on Bose's research⁹⁰. However, Dasgupta also blamed Bose for not acknowledging 'Nivedita's role as his secretarial and editorial assistant'⁹¹.

On the other hand, Nandy¹¹ is very much vocal on this issue. He claims that Nivedita started editing Bose's works as soon as she came to know him. According to him, anyone with basic training in science could have understood Bose's areas of works. He added that as 'Nivedita's basic training was in science', 'She was not, therefore, shouldering an impossible task.' These comments are in direct contrast with Dasgupta's (1999). However, he did not cite any source for making these claims. Nandy (1995) asserted that the credit for 'elegant style as well as structure' of Bose's book *Responses in the Living and Non-Living* goes to Nivedita. According to Nandy (1995), the 'collaboration' between Bose and Nivedita continued till her death.

Calling Bose's works as 'Indianised science', he claimed that the 'articulation' of it 'was in the language of a western woman.'¹¹

In the footnote, Nandy goes on to add that 'The editing was so heavy that Nivedita could legitimately be considered a junior author of some of Bose's work'⁹². He quoted Basu's calculation of page numbers and number of charts and diagrams that Nivedita edited and prepared to reinforce his claim. According to him, 'This is apart from the work she put in on his large number of papers'⁹². However, it may be noted here that he did not offer his comments based on any new source(s). Instead, his explanations are entirely based on Basu's arguments. Chakraborty⁹³ also commented on Nivedita's thoughts and ideas about science.

Perhaps, Sengupta¹² is the latest author to discuss the relation between Bose and Nivedita. He devoted a whole volume to throw light on this much-discussed topic. He is convinced, like Basu, that Nivedita played a pivotal role in the writing, editing, etc. of Bose's publications. He called Nivedita a 'Science Writer'. He added that Nivedita gained elevated confidence while working on Bose's books and papers and transmitted that into Bose as well⁹⁴. At another place, he went one step ahead of Basu and commented: (1) Nivedita was not just the editor or language-checker of Bose's writings, instead, she was, honestly speaking, his 'literary executor'; (2) Bose is not at all interested in recognising her role in his works⁹⁵.

However, it may be noted, apart from adding some comments, Sengupta did not produce any new evidence or documents to bolster his claims. He used the documents we already discussed above. It is interesting to note that he along with Nivedita's other biographers did not consult the original French version of Reymond, possibly. Looking at the references mentioned in his book, it may be said that he did not consult the English translation of Reymond's book also. Throughout the book, he always referred to the Bengali translation of Reymond's biography of Nivedita.

Conclusion

From the above discussion, it is clear that Sister Nivedita may have played a role in preparing the writings of Bose during

their long period of association (1898–1911). Recent work by Jana⁹⁶ also reiterates this fact. It shows that she may have played a significant role in revising and rewriting his texts or certain parts of his manuscripts. Her influence was visible in the use of function words, punctuation marks and in introducing new non-scientific terms. It was also noticed that Bose carried these influences even sometime after Nivedita's death (1911). It is very much probable that being a native of the English language, Nivedita had a better flair for writing English than Bose. So, she may have brought her expertise or command over the English language to play a role to edit or revise Bose's papers and books. It may be added here that from her school leaving register we come to know that 'her composition being extraordinarily good.' From this perspective, what Bose called her ('assistant') is perhaps the most apt title to describe Nivedita's role in this work. This was also reiterated by Mrs Bull (called Nivedita as the 'Secretary' of Bose), who had a very close relationship with him. Recently, Dasgupta also reaffirmed her role as a 'secretarial and editorial assistant' of Bose. It may also be noted that Nivedita herself called her work with Bose as 'scientific secretarial work' in one of her letters written on 17 March 1904. And as stated earlier, if Reymond (French version) is to be believed, Bose asked for her assistance for right 'words' and not the 'ideas'.

It may be noted here that Basu's claims about Nivedita's authorship in Bose's writings are baffling. Once he said that Nivedita was the writer of the documents and again at another place, he said that she was the writer at least from a sentimental point of view. His another claim that Bose did not acknowledge her from a sense of thankfulness towards her is perhaps confusing. In scholarly communication of science, authors in general, acknowledge the help they receive from different quarters either under 'acknowledgement' section or in the 'preface' of a book. Bose also did that in his books like in *Comparative Electrophysiology*⁹⁷. But it is also a fact that he was economical about acknowledging previous works or the works which helped him to find new frontiers of research. From that perspective, Dasgupta's criticism of Bose may be a valid one. But, as it was noted earlier, Nivedita was privy to Bose's non-citation of other's

works. And she supported that in her letter to an unknown recipient on 17 May 1906.

However, we learnt from her school leaving register that Nivedita's education on science subjects was limited and that too confined to what she learnt in her schooldays. Hence, Nandy's assertion that she had 'basic training' in 'science' is possibly a farfetched claim. This is also true for Sengupta calling her 'Bijnan lekhika' (=science writer). Rather, Foxe in this regard, perhaps presented a true picture by clearly mentioning that Nivedita accepted the fact she was no scientist herself.

It may be true that there is no clear and established rule for giving credit to persons who help in scientific work. Scientific work and that too experimental research which Bose carried out is a collaborative activity. Many people contribute to complete the whole process from setting up the laboratory to the final scholarly publications. Everyone may not be the co-author, but may be mentioned in the acknowledgement section of the paper or in the preface of the book. But Bose did not mention Nivedita anywhere. Possibly, he was carrying a legacy of the genre of 'invisible technician'⁹⁸. Later Gay⁹⁹ also threw light on this phenomenon. In this case, Nivedita may have played the role of an 'invisible editor' of Bose's writings. At the same time, it may be pointed out that foreign English scientific publishers, in general, offer the services of technical editors or language polishers to the authors for whom English is not the first language to spruce up their manuscripts with better English, in return of a fee. Some publishers mention this in their guide to the authors about how to prepare their papers for their journals. In the case of science monographs, people may notice about the presence of these editor(s) on the verso of the title page, but in case of journal articles, they remain mostly invisible, indeed. And Nivedita offered her help to Bose with no visible gain for herself, and she did it for free. Instead, she took it as her duty to help Bose to gain a respectable footing in the world science and thereby to help India to leapfrog in the world of science research globally. At tough times, she was his inspirer and offered him mental solace. Therefore, Bose could have acknowledged her either in the acknowledgement section of his papers or in the preface of his books.

But he did not do that. He, later, though acknowledged his 'assistants for their efficient help' in his 'researches'¹⁰⁰.

It is said that P. C. Ray complained to Bose about his reluctance to acknowledge others who helped in many ways in his researches¹⁰¹ in his papers. And possibly after that, Bose started to name his assistants in his papers, but not as authors but as 'assisted by'. It is also claimed that Bose acknowledged his debt to Nivedita when he said 'even when many people were in doubt about my scientific achievements, few persons were there who reposed their unflinching faith in my capabilities. Today they are no more'. Bose uttered these words while delivering the foundation ceremony lecture of Bose Institute on 30 November 1917 (ref. 102). It may be noted that here also he failed to mention Nivedita's name explicitly.

It is also possible that the real reason behind not-acknowledging Nivedita openly in his works may lie elsewhere, perhaps. As has been mentioned earlier, Bose was afraid of mixing the ideas of Nivedita with his thoughts in his works. So, he asked for only the words from Nivedita. He requested Nivedita to leave the ideas to him. It was possible that Bose was wary of reflecting Nivedita's spiritual idealism (like mixing Vedanta doctrine of unity with areas of physical sciences) in his scientific works. Had that been the case, it would have attracted more criticism for him from the fellow scientists. It would have created a more troublesome situation for him after the criticisms he faced for certain mysticism in his works. From that perspective, it was possible that he decided not to acknowledge her help openly in his works. And he may have conveyed that decision to her, privately. Given the fact that Nivedita was ever ready to help him to excel in his researches without any self-gain, she may have agreed to his proposals whole-heartedly.

In this regard, it may also be added that access to Nivedita's diaries would have helped to shed more light on this issue. Raymond¹⁰³ noted Nivedita was careful about her diaries. These contained 'block-notes' about various socio-political happenings of that time as well as notes on her work with Bose. It is learnt that Ramakrishna Mission and Bangiya Sahitya Parishad have her diaries in their collection. But, these are not accessible to general readers.

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ACKNOWLEDGEMENTS. I thank Subir K. Sen (since deceased), formerly with the Department of Library and Information Science, University of Calcutta; Prof. B. K. Sen, formerly with the University of Malaya, Malaysia, Sri Ranatosh Chakraborty and Dr H. P. Sharma, Bengal Engineering and Science University, Shibpur. I acknowledge the help received from Rose Taylor, former LRC Manager of the Crossley Heath School (earlier Crossley Orphan Home and School), Julia Gelfand, Applied Sciences and Engineering Librarian, University of California, Irvine Libraries and the University of Chicago Library for supplying some crucial documents and information. I also thank Sanku Bilas Roy, Gobardanga Hindu College, North 24 Parganas, an anonymous person who first helped the author in searching for information on Nivedita's school and education in an online forum and the anonymous referee for his valuable suggestions to improve the manuscript.

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