ACHARYA PRAFULLA CHANDRA RAY — II

(*Continued from the issue of November 2013*)

THE year 2011 marked the 150th birth anniversary of two great stalwarts of the renaissance in India: Rabindranath Tagore and Prafulla Chandra Ray. The legacy of P. C. Ray as the Acharya, the revered teacher, is captured in a profound tribute by Tagore in 1932:

> The scientist unfolds the latent power in the material world. Acharya Prafulla Chandra has gone deeper; many are the young men in whose minds he has aroused the hidden unmanifested powers of perception, discernment and insight. The seeker of knowledge is not rare, but seldom does one come across a savant who can activate the minds of men by the force of his character.
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> It is recorded in the Upanishads that The Being that was One, declared: 'I shall be Many.' This urge for self-abnegation is at the root of Creation. Acharya Prafulla Chandra has followed the same creative principle. He has become many in his pupils, his mind has rejuvenated in the minds of many. This would not have been possible if he had not made a gift of himself unreservedly. This power of creation, based on self-sacrifice, is a divine power. The glory of this power in the Acharya will never fade. (Translated from the Bengali original in [7].)

The Acharya and His Pupils

Having obtained the D.Sc. degree from Edinburgh, P. C. Ray became known to his students and friends as "Dr. P. C. Ray", a name which was soon to become very dear to his countrymen. After P. C. Ray was knighted in 1919, people proudly referred to him as "Sir P. C. Ray". But they soon felt that "Sir P. C. Ray" did not quite convey their appreciation of their beloved leader. His countrymen conferred the title "Acharya" and referred to the revered savant as "Acharya Ray" or "Acharya-deva".

When P. C. Ray joined Presidency College (1889), Chemistry was not yet a popular subject. With his demonstrator Chandrabhusan Bhaduri, Ray began to produce exciting experiments which impressed the students so much that they used to invite friends from other colleges to witness the magical effects. Thanks to Dr. Ray's personality, his reputation as a brilliant expositor, and the interest generated by his spectacular laboratory demonstrations, Chemistry soon began to attract a large number of students at Presidency College. The enthusiasm soared further with the international recognition of Ray's work on mercurous nitrite. Thus, when the

Government of Bengal introduced research scholarships, generations of talented youngsters got motivated to carry out research under P. C. Ray after completing their M.Sc. in Chemistry. The nucleus of an Indian School of Chemistry was thus formed and it began to grow with the years. In the words of Prof. F. G. Donnan ([7], pp. 66-67):

> It was he who first devoted himself to a life of scientific research on chemical problems. By his teaching and his example he has produced a great school of chemical research in India.

Ray's former student J. N. Mukherjee observed in 1961 ([10], p. 14):

> Outweighing his achievements as a scientific worker, the creation and fostering of the Indian School of Chemistry will ever remain his conspicuous contributions towards national progress of Indians.

P. C. Ray's laboratory was described by Prof. Sylvain Lévi as "the nursery from which issue forth the young chemists of New India" ([5], p. 164). About the pupils of P. C. Ray, Prof. Donnan observed ([7], p. 67):

> They were infused by the spirit of their Master in India, and were determined to carry on the great work which he had begun. Nobly have they done so. India now ranks high amongst the nations of the world which contribute importantly to the advance of science. It would be difficult to overestimate the part which the work and influence of Sir P. C. Ray has played in this splendid development.

Among P. C. Ray's students at Presidency College who became world-famous chemists, Nilratan Dhar (1892-1986) originated Physical Chemistry research in India and was a pioneer in agricultural research in the country; Jnanendra Nath Mukherjee (1893-1983) was a pioneer in Colloidal Chemistry research in India and Jnan Chandra Ghosh (1894-1959) "excited the attention and admiration of the scientific world" by his theory of strong electrolytes and formulation of "Ghosh's Law". To give an idea of their stature, we mention here that N. R. Dhar served in the Nobel Committee (for Nobel Prize Award) in Chemistry in 1938, 1947 and 1952; J. N. Mukherjee became Director of the Indian Agricultural Research Institute; J. C. Ghosh succeeded C. V. Raman as the Director of IISc at Bangalore and then became the first Director of the first IIT established at Kharagpur. J. N. Mukherjee and J. C. Ghosh founded the Indian Chemical Society in May 1924 with the Acharya as its first President. *The Journal of the Indian Chemical Society* was founded in the same year.

While N. R. Dhar, J. C. Ghosh and J. N. Mukherjee were brilliant students at

Presidency College, P. C. Ray could also recognise in Jitendra Nath Rakshit, a student who failed in the B.Sc. degree examination from St. Xavier's College, a "worker of rare gifts". This precious "find" of P. C. Ray collaborated with him in the isolation of ammine nitrites (one of Ray's major research achievements) and contributed around 40 papers. Rakshit's method of estimation of morphine and codeine has been quoted at length in treatises on Analytical Chemistry.

Bires Chandra Guha (1904-62), who was a student of Acharya Ray at Calcutta University during 1923-26, is regarded as the Father of modern Biochemistry in India. Other students of P. C. Ray who made their mark in Chemistry include Priyada Ranjan Ray (1888-1982), Pulin Behari Sarkar (1894-1971), Rasik Lal Datta, Manik Lal Dey, Hemendra Kumar Sen, Biman Behari Dey, Panchanan Neogi, Prafulla Chandra Guha, Jnanendra Nath Ray, Jogendra Chandra Bardhan, Prafulla Kumar Bose, Gopal Chandra Chakravorty, Monomohan Sen, Susil Kumar Mitra. Jatindra Nath Sen, the first research scholar to work under P. C. Ray, collaborated with him in his investigations on mercurous nitrite.

While many of P. C. Ray's students were to become renowned chemical scientists, some became teachers in different colleges in India inculcating a love for Chemistry among students and some of his students went into manufacturing houses, especially chemical industries, under his guidance. As narrated by one of his pupils in 1924 ([6], p. 12):

> Sir P. C. Ray takes so much interest in the progress and future well-being of the students that he always attracts a large band of young enthusiastic workers around him and imparts to them his enthusiasm for the subject. He is the founder of a large school of chemists in India, his students are filling chairs of chemistry in every part of the country and he may be looked upon as the intellectual father of most young Indian chemists.

One of his students, Atul Chandra Ghosh, became a teacher in Dayal Singh College, Lahore. Among the students of the college to whom Atul Chandra Ghosh transmitted his master's enthusiasm for Chemistry was Shanti Swarup Bhatnagar (1894-1955) who was to become a stalwart of the Indian School of Chemistry. Like P. C. Ray, his grand-pupil S. S. Bhatnagar contributed extensively to both basic and applied research.[1] Acknowledging the impact of Ray, Bhatnagar had remarked in 1928 ([10], p. 15):

1. S. S. Bhatnagar also played a major role in building the Science and Technology infrastructure in independent India and formulating the national science policies. The highest Prize in India for research in Science and Technology, instituted in 1958, has been named after him.

If a census were to be taken of all the Indian Chemists who have published any original work and if they were asked to indicate the source of their inspiration, I believe the majority would ascribe the credit to Sir P. C. Ray.

P. C. Ray was also the teacher of many celebrated names like Upendra Nath Brahmachari (1875-1946), Meghnad Saha (1893-1956) and Satyendra Nath Bose (1894-1974) who made major contributions in other disciplines of science, each of them keeping up the promise "to count for something in the world's science" mentioned at the beginning of Part I. Dr. U. N. Brahmachari (1922) synthesised a series of antimonial compounds, most notably Urea Stibamine — a wonder drug that was mainly responsible for the eradication of the deadly disease kala-azar which was taking a heavy toll of lives in Assam and Bengal. M. N. Saha's work, which laid the foundation of the theory of thermal ionisation in the 1920s, is a cornerstone of modern Astrophysics; his Saha ionisation equation is used to describe the chemical and physical conditions of stars. The seminal 1924 paper of S. N. Bose laid the foundations of quantum statistics. Primarily a mathematical physicist, the interests of this versatile pupil of P. C. Ray included Chemistry.[2]

What made P. C. Ray's teaching so effective in infusing a strong chemistry culture among students? We list a few salient features that come out from the accounts of his former students and Ray's autobiography.

First, his excellence in performing chemical experiments which he planned and arranged so as to make his class-lectures more interesting and intelligible. As a Hope Prize scholar in Edinburgh, Ray had already gained a fair amount of experience of laboratory work while assisting his Professor in conducting practical classes. After joining Presidency, he "went through repeated rehearsals of class-experiments requiring dexterity". Never allowing pride to come in the way of learning even from a subordinate, Ray did not hesitate to take the aid of the experienced demonstrator Bhaduri in order to perfect his experimental skills; sometimes he also consulted Prof. Pedler, his former teacher.

Second, his careful preparation of class lectures. The lectures, supplemented by experimental demonstrations, were designed to help students attain a grasp of principles and a clarity in their ideas. Again, without trusting himself to "mere extempore delivery", Ray often used to "write the substance of his lectures beforehand". N. R. Dhar reminisces ([8], p. 161) that Acharya Ray "took great pains and often corrected the lecture notes taken down by his pupils". B. N. De mentions ([8], p. 151) that in the event of an appreciable number of students not following his

2. Satyen Bose had set up laboratories in organic chemistry at the universities of Dhaka and Calcutta and interacted with chemists. Bose's collaborators include the noted chemist Dr. Asima Chatterjee who worked with him since 1946 on the structure and stereo chemistry of several alkaloids and other organic substances. Bose guided important experimental works on crystallography, fluorescence and thermoluminescence. Work on inorganic complex salts and clay minerals was another major contribution of S. N. Bose.

lectures or his experiments, he would readily repeat them for the benefit of the whole class. His simple and lucid teaching would kindle an interest among students to acquire more knowledge of the subject.

Third, his passion for teaching — it was "with relish and zest" that he performed his teaching duties. An anonymous pupil records ([6], p. 8):

> That he has been able to transmit to his pupils the love he feels for chemistry is chiefly owing to his putting his whole heart into the matter when he was engaged with them in the laboratory or the classroom.

When P. C. Ray joined Presidency, Prof. Pedler went home on 3 months' leave and the young inexperienced Prafulla Chandra was left in charge of the entire department. Sometimes Ray had to lecture to three classes in succession. His attitude towards teaching can be seen from the effect that the heavy workload had on him ([5], p. 84):

> . . . the work itself was my delight and, as I experienced almost a romantic sensation, I did not break down, nor did my interest flag.

Fourth, the historical insights into the subject that he gave to the students by weaving into his lectures the contributions of the pioneers. Ray tried to build a bridge between the "Makers of Modern Chemistry" and his pupils by interspersing his lectures with inspiring anecdotes from the lives of the great masters. J. N. Mukherjee recalls ([10], p. 336) that Ray would explain the true significance of the subject, its practical utility and its necessity in the industrial progress of the nation. He would also point out that it was in India that the pursuit of chemical knowledge had begun and that ancient Indian savants had made considerable progress in the discipline.

Fifth, the liveliness of his lectures. With his wide literary and historical readings and his natural wit, P. C. Ray enriched his lectures with apt citations from his favourite authors like Shakespeare and Emerson, Madhusudan and Rabindranath, Nagarjuna and Vagbhata.

Sixth, his warm lovable personality, kindness and close personal association with his students. He was a person whom students coming from the countryside could easily approach for helpful advice. He provided financial help to needy students. Ray's simplicity, his informal manners and his personal touch made him very dear to his students. Prof. F. G. Donnan, who had closely interacted with some of P. C. Ray's illustrious students, remarks about the self-effacing personality of Ray ([7], p. 66):

> The extreme modesty of the man was amazing. Here was the Father of Modern Chemistry in India in my laboratory, and yet one scarcely knew he was there at all.
>
> I noticed how he was revered by his old pupils. But not only revered — beloved also. Here was a man who, through the personal example of a life devoted to science and to the care and teaching of his disciples, could inspire in them the deepest reverence and affection.

The Acharya lived simply and dressed simply. A former student recalls ([8], p. 226),

> Dr. P. C. Ray was so very simple in his habits and dress that on the first day I attended his class, I was puzzled as to who was the reputed professor and who was his lecture assistant . . . But after the roll-call was over, all doubts were set at rest: the flashing eyes out of a feeble frame, the clear and lifelike exposition soon drew out attention to him as a magnet attracts particles of iron.

The money that Ray saved by his Spartan lifestyle was disbursed in donations (some of which we will mention in Part VI). The austere lifestyle of the great philanthrope too had a profound impact on his pupils.

Ray's students at Presidency College were his constant companions in his evening walks after college. At opportune moments, whether in class or outside, Ray would talk about stalwarts in science like Cavendish, Priestly, Scheele, Lavoisier, Dalton, Berzelius, Liebig, Darwin, Pasteur — about their efforts, hurdles and triumphs. For P. C. Ray's students, who had to work with scanty equipment, it was heartening to know that Berzelius made his epoch-making discoveries in a small laboratory with his housemaid Anna as his only assistant and that he determined atomic weights with uncanny accuracy using an inkpot as a counterpoise. He would urge his students to read the autobiography of Benjamin Franklin and emulate his example. Ray would also mention the dedication of ancient Indian chemists like Nagarjuna who had to undergo great hardships, austerities and penances to acquire the knowledge of chemical operations. Sometimes he would recite *shlokas* from ancient Indian manuscripts, sometimes he would quote long passages from English literature.

P. C. Ray retired from Presidency College and joined the University of Calcutta in 1916, where teaching took place only at the postgraduate level. One of his former students records, with regret, in 1924 ([6], p. 15) that, as a consequence, "the students first entering into their college career now no longer find any opportunity of coming in contact with a teacher of such inspiring presence as P. C. Ray. There are none to fire them with a burning love for chemistry." There have been good students and teachers subsequently; but the magic of the earlier years when scientists like J. C.

Bose and P. C. Ray were nurturing young pupils like S. N. Bose, M. N. Saha, J. C. Ghosh, J. N. Mukherjee, M. L. Dey, P. B. Sarkar (all belonging to the memorable 1909 batch), N. R. Dhar, P. C. Mahalanobis and R. L. Datta (slightly senior to the above batch), was perhaps never recreated again.

When the Acharya passed away in 1944, a Memorial programme was held at Presidency College. P. C. Mahalanobis[3] (who was, by then, well-established as an outstanding scientist) came to attend the Memorial programme in spite of his ill-health and declared, "Though I am very ill, I have rushed here to tell you something. The kind of treasures that we got when we were students, from Acharya Prafulla Chandra Ray and other teachers, have been great assets in our life. But, with a deep sadness, I have to tell you that when we became teachers we could not hand over to you any such treasure. It is to convey this message that I had to come out of my medical confinement today."[4]

Acharya Ray's life with his pupils reminds us of ancient Indian Ashramas. An admiring pupil remarks ([6], pp. 14-15):

> Again, his close relationship with his pupils reminds one of the Rishi-Gurus (sages and preceptors) of India. He has been able to some extent to revive the traditions of the Ashramas of ancient India. This is the reason why he has been instrumental in inspiring his pupils with a love for chemistry and in maintaining a succession of students of chemistry in Bengal.

The Acharya transmitted to his students not only his love for Chemistry, but also his love for Bengal and love for India. He made them aware of the nation's problems. Through his personal lifestyle and interactions, he moulded the minds and characters of his students. They could feel that it was his identification with the poor people of India that made the Acharya shun all comforts and luxury. As noted in *Nature* (1937):

> Those who know him are fully aware, there could be no better preacher for throughout his long life he has practised every precept he preaches with a vigour which is beyond admiration.

3. Prasanta Chandra Mahalanobis (1893-1972) is the pioneer in research and use of statistics in India — the "Mahalanobis distance" and his work on large-scale sample survey are among his great contributions to the subject. Almost all the statistical work in India during the 1920s and till the mid 1930s was done under his leadership. The early statistical studies were of great impact in the control of floods and development of agriculture. In 1931, Mahalanobis founded the Indian Statistical Institute. He was elected FRS in 1945.

4. The episode is narrated by Prof. Shyamal Sengupta (*Rachana Sankalan*, p. 367), who was a student at Presidency College in 1944. I thank Prof. Syamal Chakrabarti of Calcutta University for this anecdote.

Not surprisingly, some of his students, like his beloved pupil Meghnad Saha, became prominent figures in social and national service. Dr. Rajendra Prasad, the first President of India, had P. C. Ray as a teacher when he joined Presidency College as a science student in 1902. Rajendra Prasad shifted to Arts, but he would lovingly recall the influence of Ray. In a message from the Rashtrapati Bhavan in 1962, he said ([8]):

> . . . many of us were infused by the spirit of our Master and even inspired by his ideal and example to dedicate ourselves to the service of our mother country.

We mention an episode ([8], pp. 151-152) narrated by Birendranath De who hailed from Midnapore and had P. C. Ray as a teacher at Presidency from 1898. As a novice in the chemistry practicals, Birendranath had been heating a cold test-tube containing some liquid, holding it without shaking on the flame. Ray noticed it from the other end of the laboratory and rushed to De and explained that the tube might burst if he held it in that manner, as glass is an imperfect conductor of heat. P. C. Ray gave the instruction to bring the tube over the flame gradually and intermittently through the Bengali phrase, *saiye saiye dharte habe ebong kāj karte habe*, an utterance which conveyed to Birendranath the more general advice that, in any sphere of life, one has to carefully accomplish a work by gradual stages. Years later, the Acharya would be giving the following advice to Ranjit Singh Satyasray, a student-volunteer in a political conference ([8], p. 224):

> You are to shape a national character which is not yet formed. Do not tell them what they cannot grasp or follow. . . . *Lead them step by step, bit by bit.* There is no hope for Swaraj by chance.

When P. C. Ray began to stay in the Rajabazar premises of the University College of Science, two or three of his students generally stayed with him and shared his simple food. They had to manage the household affairs among themselves and conduct the mess-management economically; someone would be the house-keeper, someone would keep accounts, etc. But the Acharya never allowed them to render him any personal service and commanded them to be absorbed in their studies.[5] Bires Chandra Guha, one of his illustrious students, recalls ([8], pp. 180-182) that when he joined the Science College as an M.Sc. student the Acharya asked him to stay with him as otherwise he would be spending two hours daily in commuting which would mean a loss of a large number of days in a year. The Acharya said that

5. Gopal Chandra Chakravorty, Prafulla Kumar Bose, Bires Chandra Guha, Nadiabehari Adhikari, Susil Kumar Mitra, Dinesh Chandra Sen, Sanat Kumar Bandyopadhyay and Nripendra Nath Ghosh were among the students who had the privilege of staying with him.

such a loss of time could not be tolerated when all of them had to work hard and work fast. Guha writes that the Acharya lived on Rs. 30 per month, washed his own clothes and refused even to have an electric fan in his room.

The Acharya disliked lackadaisical work or any wastage of time and resources in the laboratory. People were not to talk with each other except on scientific problems, no Bunsen burner could be kept burning with a long flame when not in use, no chemical, filter-paper, gas, water or electricity could be wasted, no printed letter-head could be used for scribbling. A research scholar was severely rebuked for dropping a few drops of mercury while filling a tube.

The Acharya also emphasised the importance of a good physique; he used to express his admiration for students with vigorous health and energy.

The bonds that existed between the Acharya and his students were, in the Acharya's words, "as subtle as those of chemical affinity". The address which the students presented on the eve of his retirement from Presidency College ([5], pp. 188-189) speaks for itself. We quote excerpts:

> Your place in the college, Sir, we are afraid, can never be filled. Men will come and men will go but where else can we possibly expect to find again that sweetness of disposition, that vigour of simplicity, that unwearied spirit of service, that broadbased culture, that wisdom in deliberation and debate which for the space of thirty years or more endeared you so much to your pupils?
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> . . . Your way of life, with its distinct Indian traits, recalled us to the sweet and simple and manly days of Indian attainment. You have been to us all through a guide, philosopher and friend. Easy of access, ever-pleasant, ever-willing to help the poor and needy student with your counsel and your purse, living a life of sturdy, celibate simplicity, with genuine patriotism, not loud but deep, you have been to us an ancient Guru reborn, a light and an inspiration from the treasure-house of old Indian spirituality.

P. C. Ray's Writings and Discourses on Science

P. C. Ray wrote extensively in English and Bengali, on a wide variety of subjects ranging from primers in science to scholarly articles on Shakespeare. A striking feature of his writings is the simplicity in style, very much in tune with his general personality. One is reminded of a remark by Bipin Chandra Pal ([1], p. 181):

> . . . simplicity is the deepest characteristic of Sir P. C. Ray's genius and character. To miss that would be to miss the whole secret of his greatness.

Noting the inadequacy of existing textbooks for undergraduates, P. C. Ray took upon himself the task of writing a new textbook on Inorganic Chemistry (1909)

adapted to fulfil the requirements of the I.Sc. syllabi of Calcutta and Allahabad universities. By then, he had the experience of 20 years' undergraduate teaching at Presidency College. Even after a hundred years, the book can serve as a role-model for teachers and textbook writers as to how a subject can be presented in the style of a lively interesting narrative, how the principles of the subject can be gently instilled in the minds of juvenile learners and how the art of discovery can be subtly promoted using illustrious examples from history. Avoiding the temptation of crowding the pages with a multiplicity of facts, Ray chooses to build the main fabric of his subject with the aid of a few well-chosen facts. Symbols, formulae, equations, hypotheses, terms and technicalities are not rushed in at the outset but introduced gradually. Figures like Priestley, Lavoisier, Cavendish, Dalton and others are constantly kept before the mind of the learner. This textbook (reprinted in [10]) and his books like "The Makers of Modern Chemistry" (1925) and "The Discovery of Oxygen" (1926) give us some concrete idea regarding the teaching genius of P. C. Ray, the Maker of the Indian School of Chemistry. In the next part, we shall discuss separately Ray's writings on the history of science, especially ancient Indian science.

Ray's Bengali books related to science include a primer on Zoology (written around 1890 but published in 1902), a book on Modern Chemistry and its development (1906), a book on chemical synonyms (with Probodh Chandra Chattopadhyay), a book on Indian Colours (1929), a book on Food (with Haragopal Biswas, 1936). Besides, he wrote numerous articles in periodicals.

To give a flavour of Ray's discourses on science, we quote excerpts from a lecture at Calcutta in January 1916, where Ray refers to the insuperable difficulties, hostility or indifference faced by the early pioneers of modern science ([4], p. 37):

> These great and mighty interpreters of the laws of nature cared not for name or fame, but considered themselves lucky if only they could be instrumental in giving to the world the results of their lifelong labours. Kepler had imposed upon himself years of incessant toil including midnight vigils in observing and recording the motions of heavenly bodies; and after embodying the results of his labours he exclaims, "I may well wait a hundred years for a reader, since God Almighty has waited six thousand years for an observer like myself."
>
> If Europe is what she is to-day — if she is in the van of scientific progress — it is in no small measure due to the self-denying ordinances of these great heroes in science and their worthy successors.

Ray then makes no secret of the long road ahead for India ([4], pp. 37-39):

> Those who intend to pursue chemistry in India must not expect to reap a rich harvest in the immediate or near future. . . . Those who are pioneers in this field have no traditions to go by or follow up; they have to chalk out their own

> path and formulate their own schemes and carry them out as best as they may. Difficulties arise at every turn but with faltering steps the weary pilgrim must keep marching on towards the goal; happy if he reaches it but equally happy if he perishes in the attempt.

One feels as if one is hearing the utterance of an ancient Rishi.

Again, in an address at Madras University in February 1918, we hear Dr. Ray, the historian, the teacher and the prophet ([4], pp. 87-89):

> Thus it is that even after a lapse of 7, 8 or 10 centuries, Govinda, Somadeva, Nagarjuna, Ramchandra, Svachchanda Bhairava and others appeal to modern India in eloquent terms from dust-laden shelves and worm-eaten tomes and manuscripts not to give up the pursuit of the Science they so dearly professed. As I find gathered round me the flower of the youth of Madras, may I join in the appeal so eloquently given utterance to by the chemist Nagarjuna some 1000 years ago:
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> "For 12 years I have worshipped in thy temple, O Goddess; if I have been able to propitiate thee, vouchsafe unto me, thy devotee, the rare knowledge of Chemistry."
>
> If twelve years was considered as the irreducible minimum of time which an ardent student ought to spend in mastering the intricacies of our science at such a distant date how many years' assiduous devotion is required to master it to-day? . . . If I could for a moment command the organ voice of Milton I would exclaim that we are of a Nation not slow and dull, but of a quick, ingenious and piercing spirit, acute to invent, subtle and sinewy to discourse, not beneath the reach of any point the highest the human capacity can soar to. . . .
>
> You, young men of the rising generation, will not, I trust, fail to play your part. As in the glorious palmy days of old, so in the days to come, it will depend upon you whether or not our dear Mother-land is to hold her head aloft and secure for herself a recognised place in the comity of nations.

P. C. Ray on Education

The topic is vast. We touch upon only one theme dwelt at length in ([5], pp. 259-315):

P. C. Ray's concern at the "inordinate, insane craze — almost a mania — for securing a degree" which he describes as — "a canker eating into the very vitals of intellectual life and progress" ([5], pp. 260-261). Ray was of the view that "those alone should seek the portals of the University, who have got the real vocation for it" ([5], p. 497). But he observes that the universities were becoming "huge factories for mass-production of graduates" and turning out youngsters with a "lamentable

lack of initiative, resourcefulness and pluck" ([5], pp. 260- 261). The aimless pursuit of degrees like M.A. and M.Sc. by the Bengali youth only results in putting off "the unpleasant day when they will be called upon to face the stern realities of life, forgetting all the while that the higher they go up the ladder, the more hopeless and incapacitated they become when confronted with the world's battlefield" ([5], p. 497). For P. C. Ray, "the degree only serves as a cloak to hide the degree-holder's ignorance" ([5], p. 261). Dr. Prafulla Chandra Ghosh[6] mentions an anecdote ([8], p. 259) regarding the Acharya's contempt for the excessive propensity towards bookish examination-oriented studies among Bengalis. A person with an M.A. degree came to meet Acharya Ray. On hearing that the person was preparing for M.A. examinations in another subject, Ray quipped in his characteristic style, "Creator created the Bengalis for passing examinations, fulfil His wish."

P. C. Ray laid stress on the cultivation of the mother-tongue (cf. [5], pp. 289-299). In recognition of his contributions towards the advancement and enrichment of the Bengali language, P. C. Ray was elected President of the Bangiya Sahitya Parishad (1931-34). Earlier, he had been elected President of the Bangiya Sahitya Sammilan (1909).

Acharya Ray was opposed to the abolition of compulsory Sanskrit from the Matriculation course. Ignorance of Sanskrit, he felt, would hopelessly weaken and vitiate the style of Bengali authors, even on scientific subjects. He declared ([9], p. 134):

> . . . those who do not know Sanskrit literature, cannot write Bengali well.

In his early days, P. C. Ray had studied Sanskrit under the guidance of Pandit Harish Chandra Kaviratna, a Professor of Sanskrit in Presidency College. While the Acharya might not have written at length on Sanskrit literary or philosophical treatises, he had studied Sanskrit classics, like some of the works of Kalidasa. His nephew recalls ([8], p. 199) Acharya Ray once telling him that the knowledge of all Upanishads is condensed in the verse (the first verse of the Isha Upanishad)

> īśā vāsyamidam sarvam yat kiñca jagatyām jagat
> tena tyaktena bhuñjīthā mā gṛdhah kasya svid dhanam
>
> ईशा वास्यमिदं सर्वं यत् किञ्च जगत्यां जगत्।
> तेन त्यक्तेन भुञ्जीथा मा गृधः कस्य स्विद् धनम्।।१।।

6. Gandhian leader who later became the first Chief Minister of West Bengal.

This favourite verse of the Acharya declares that the Lord pervades all things that move and change in this moving world; renouncing the ephemeral, one is to rejoice in Him and not covet what belongs to others.

P. C. Ray would advocate the Eastern conception of Education — the tradition of the Tapovana, the ideal of plain living and high thinking. In a convocation address at the Aligarh National Muslim University in 1923, the Acharya remarked ([9], p. 554):

> . . . Oxford and Cambridge with their costly appurtenances will not do for us; in the rage for forms and furniture and machinery, we must not lose the substance. We cannot allow our Mother Saraswati to be enmeshed in the toils of wood and brick and mortar and strangled to death.

He continues on the ideals of a student's life ([9], p. 554):

> I would even go further. I would, if I could, revive the Brahmacharya traditions of our ancient schools, that ascetic discipline that laid the foundations of a virile and self-controlled manhood, that enabled the young men in after-life to stand four-square to all the winds that blew.

The above statement reminds us of a passage from Sri Aurobindo's "The Brain of India" written in *The Karmayogin* in 1909.[7]

In the next instalments of the article, we will briefly recall how the Acharya had made a gift of himself not only as a scientist, a teacher and an educationist, but also as a science historian and a writer, an industrial entrepreneur, a patriot and a nationalist, a social worker and a philanthropist.

(To be continued)

AMARTYA KUMAR DUTTA

7. See pp. 1006-08 of this issue for the passage referred to. — Ed.

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The teacher is not an instructor or taskmaster, he is a helper and guide.

Sri Aurobindo

(*Early Cultural Writings*, CWSA, Vol. 1, p. 384)