EXPLORATION

B.Sc/BHSc/B.Sc Bio-tech/BCA/BFT II- Sem English Text Book

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Content

UNIT I : SCIENCE WOMEN AND SOCIETY

This unit contains two essays. The titles of the two essays are 'Where are the Indian women in Science?' and 'Science and Society: the Perspective of an Indian woman scientist' authored by Sheryl Sebastin and Anita Mehta respectively. The focus of this Unit is to locate women in the field of science & technology and English language. On one hand these essays present the problems faced byIndian women scientists to establish themselves in the field of Science and Technology on one hand and practice in the language aspects like vocabulary and sentence patters on the other.

1. WHERE ARE THE INDIAN WOMEN IN SCIENCE?

Sheryl Sebastin

We all read those articles titled 'study finds' or 'scientists suggest' in papers and on the internet. If the first thing that pops into your head while reading it, is the image of a middle-aged, eccentric, Einstein-esque man, it is obviously problematic but you cannot be blamed entirely. One of the rare occasions in which Indian women scientists were visible in mainstream media was when Mangalyaan was sent to Mars in 2014 – a picture (featured image) of the jubilant women behind the mission was on the front page of all the leading Indian newspapers.

Women's representation in science globally is abysmal but even more so in India. According to reports by the UNESCO Institute for Statistics, women researchers comprise only 28% of the total scientists in the world and, in India, this figure is a painfully low at 14.8%.

The enrolment of women into science courses has increased significantly from 7.1% in 1950 to 40% as of 2009. Yet, female graduates and postgraduates in science somehow don't always transition into PhD holders and researchers. Among the PhD holders, 37% are women, but less than 15% hold science faculty positions. The UNESCO describes this as the 'pipeline effect'- losing a little at every step of the way. So, why are we losing women in the scientific career path?

Jocelyn Goldfein, a director of engineering at Facebook probably said it best, "*The reason there aren't more women computer scientists is because there aren't more women computer scientists*". One of the reasons for fewer women in science is the lack of role models in the field and that really is a vicious cycle. But even when there are women researchers out there making scientific breakthroughs, their stories are never heard. While almost all of us recognize CV Raman and S Ramanujam, how many of us have heard of Janaki Ammal or Anandibai Joshi?

It is this discrepancy in the statistics regarding women in science and their underrepresentation in the public domain that bothered former scientists Aashima Dogra and Nandita Jayaraj. They wanted to find out where the Indian women in science were, and what they were up to. "*We decided that the best way to do this would be to go on the ground and see for ourselves*", they write in an article published in the Economic and Political Weekly

(EPW). Together, they started a blog named 'The Life of Science' that brings to light the stories of female researchers from across the country with special focus on their work, what motivated them to become scientists, what motivates them to stay and what pressures they've had to fight off to get there.

In a society that has an inherent bias that tells women that they aren't bright enough, they tend to underestimate their own capabilities and assume that they wouldn't be able to handle challenging subjects like physics, maths or engineering. In an interview with *The Life of Science*, Maryam Baghini, an electrical engineer at IIT Bombay says "*I have worked with electrical motors and faced no problems. Women need encouragement. It's a matter of telling girls that engineering is the same as other areas*."

About a decade ago, former Harvard President Lawrence Summers tried to explain the gender gap by pointing out, that men and women are wired differently. Because as several examples in the Indian political system point out, when there exists sexism there exist men in power who will try to justify it instead of figuring out ways to do something about it! Vidita Vaidya, a neuroscientist at the Tata Institute for Fundamental Research (TIFR) agrees this is a lazy excuse. In another interview with The Life of Science, she says, "*You can't use this meritocracy debate! Are you telling me genetically we are incapable? Clearly (we are) not. The brain is clearly capable of performing irrespective of gender. I think it's reflective of the patriarchal society. It's not true to think that science is not patriarchal because science is practised by people and people are conditioned that way*" (she exclusively studies the brain, so you bet she knows what she's talking about!). Here's a 2009 paper published by Stephen J. Ceci, Wendy M. Williams and Susan M. Barnett of Cornell University for further proof.

Kavita Shah, one of the directors at the Banaras Hindu University, believes that "*There are only two kinds of women who can go very far in research: those who have support from their families and those who rebel against the oppression*." This is because, apart from the universal challenges female scientists face at the workplace, Indian women have to tackle a specific set of problems of their own.

The idea of a woman prioritizing her professional life is unimaginable in conservative Indian communities because it is believed to shift focus from their primary role – that of being a mother. Women aren't always urged to take on challenging courses like science and are

encouraged to settle for easier options so that they can sustain themselves until they're married off to a man who can actually support them.

The scientific field also requires maintaining a certain rapport with authorities and colleagues and it becomes essential to be part of the inner circle or the 'boy's club'. This is sometimes a constraint in a deeply patriarchal society like ours which views female-male interactions in an unhealthy and often one-dimensional way. This could sometimes affect the visibility of female scientists and reduce recognition for their achievements. This exclusivity could also result in a lack of mentoring for women. Radhika Nair a cancer biologist at Rajiv Gandhi Centre for Biotechnology, Trivandrum, believes the problem isn't insurmountable. "*In the beginning, a woman may have to be ready to work twice as hard but at a point, it becomes a level playing field. There are boys clubs, but I don't care about that. I've been lucky to have had mentors who don't look at us as women but as scientific colleagues. That's why you aim for areas of excellence because that's where you find people like that*."

On the other hand, Charusita Chakravarty, the 2009 recipient of the prestigious Shanti Swarup Bhatnagar Award admits that she has had to turn to stronger networks overseas because of this isolation. But is there no other way apart from holding on and trying to survive in a system designed to keep women out? Shubha Tole, a neurobiologist at TIFR is trying to change the system from within. She explains that "*(My) struggle itself is the contribution because in not yielding and not changing who I am, I make it easier for the next woman who does not fit the expected stereotype of being pliable, non-controversial and accommodating*."

Another reason Indian women are losing out in science is because of the time-off they need to take after bearing children. As a society that still puts the pressure of primary care taking solely on women, re-entry into an ever-changing, fast-paced stream like science after a long hiatus is rather difficult. In this regard, Radhika Nair admits that "*People say there is no bias against women who've taken a break but believe me there is. The thing is, if you take a break for maternity in science, it's not just the one year you miss out on because by the time you can restart it takes twice as long. It's so competitive that two years can be a lifetime."* It is no surprise then that the aforementioned Bhatnagar prize awarded to scientists below 45 years of age has had only 14 female awardees as of 2010, out of the 463 awards handed out. "*Time just runs out for many women scientists who take a break for the family*," admits Mitali Mukherjee, a scientist at the Institute of Genomics and Integrative Biology (IGIB), New

Delhi, who won the award in 2010. In their report for the EPW, Aashima and Nandita note that most mothers among the scientists they interviewed stress on support from family, in being able to raise a child because of the long and erratic work hours that a career in science calls for.

The absence of female researchers certainly reflects in the kind of research that has been done so far. Since there is only the perspective of men involved in the narrative, there are some disastrous consequences that follow. Since the dawn of science, the standard reference used has been an average sized male, be it testing the effects of certain drugs or studying the symptoms of a disease. For the longest time, the sexes of the animals used for lab testing and of the people who attend clinical trials had also been overwhelmingly male. As a result, some of the scientific studies cannot even be applied to women because they haven't been interpreted specifically for them! This has had consequences like not recognizing the symptoms of cardiovascular disease in women until much later and not investing enough in research to analyse and treat menstrual pain because it hasn't been considered relevant enough.

Imagine the body of knowledge that we're missing out on by excluding women from this field. The skills and ideas that we haven't even begun to tap into yet!

Source: https://feminisminindia.com/2016/09/08/where-indian-women-in-science/

Glossary:

Abysmal:extremely bad; appalling

Discrepancy:an illogical or surprising lack of compatibility or similarity between two or more facts.

Mentoring: a senior or more experienced individual (the **mentor**) is assigned to act as an advisor, counsellor, or guide to a junior or trainee. The **mentor** is responsible for providing support to, and feedback on, the individual in his or her charge

Patriarchal:relating to or denoting a system of society or government controlled by men.

Hiatus:a pause or break in continuity in a sequence or activity

Cardiovascular:relating to the heart and blood vessels.

Comprehension

I. Answer the following questions in one or two sentences each

1. On what occasion did the Indian women scientists get importance by the mainstream media?

2. What does UNESCO report say on Women's representation in Science?

3. What is the 'pipeline effect'? Explain it in the context of women in Science.

4. What is "The Life of Science?"

5. What is the inherent bias about women in the Indian society?

6.Why is the Indian woman deprived of her professional prioritise her professional?

7. How do you assess Shubha Tole's contribution to women?

8. Identify the synonyms for the nouns (except the proper nouns) used in the first two paragraphs.

9. Find out the antonyms for the synonyms identified in the question No.8.

II .Answer the following in not more than a page each

1. Why do Indian women fail to make a mark in the field of Science?
2. What are the struggles and attempts made by women to establish themselves in the field of science?
3. Write a brief note on "The Life of Science"
4. Identify the sentence patterns of the following sentences:
   (a)Women's representation in science globally is abysmal but even more so in India.
   (b) So, why are we losing women in the scientific career path?

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2: SCIENCE AND SOCIETY: THE PERSPECTIVE OF AN INDIAN WOMAN SCIENTIST

By Anita Mehta

In a patriarchal society, it has not been easy for women to establish themselves in any field of knowledge. Against all odds, women have been striving hard to establish themselves . In course of time the things have been gradually changing but yet women have not been easily accepted like men in the field of science and technology.Anita Mehta speaks about it in a conference. She illustrates in detail the reaction of men when she pioneered a new field of research on granular media, physics of sand granules. She analytically tries to give an answer, why women have been pushed to the background in the academics.

Anita Mehta begins her talk in a conference with a light-hearted anecdote, which nevertheless illustrates three of the main points that she would touch on during its course. Following is an excerpt from her talk. "When, as a young post-doctoral researcher, I was trying to pioneer a new field of research (the physics of granular media, or more colloquially, the physics of sand piles), I came across various reactions to this. Let me attempt to classify these under the more solemn subheadings of my abstract:

1. (Dis) respect for gender identity. I was frequently referred to as 'that sand pile woman', which conjured up visions of a laid-back woman lazing on the beach, dabbling in thesand. The implication in most such cases was that only a dilettante would dabble in a subject as frivolous as sand, and of course, as a woman, I was more than likely to be not completely serious in my pursuit of the sciences. I am sure that my love of subjects outside the sciences, such as music and literature, only added to this perception in certain scientific circles, of an essential light-hearted- (and alas, light-headed-) ness!

2. (Dis) respect for gender/cultural identity / Links of the enlightened across countries/ genders. As time went on, and I was exposed to more and more seminar audience as an invited speaker, I occasionally had to confront somewhat hostile ones, as do we all. However, it was, in fact, a French (male) colleague who on one memorable occasion alerted me to the fact that sections of the audience were planning to be confrontational at an invited talk for one of the European Gordon Conferences. His advice to me was to shine the laser pointer into the eyes of those people who tried to heckle me! – Although in the end, I did not need to resort to this somewhat extreme option, I did tackle the hecklers appropriately, much to the relief of my colleague. After my talk was over, my colleague asked me why I had been a target for heckling: after all, he said, I had given a sensible talk, and a man in my place would not have been similarly targeted. Was it, he asked because I was an Indian or a woman? My reply was, none of the above: my real crime was that I was unprepared to apologize for being either...

3. Rights of authors. This story does, however, have at least a partially happy ending. The field I was trying to publicize was in fact taken very seriously within a couple of years, and many of my early ideas soon gained reasonably wide currency. The fact that they were/are not normally ascribed to me is, I feel, a small price to have paid for this.

I apologize for this rather personal introduction, but much of what I will say has been informed by my personal experience as an Indian woman scientist. Of course, it has been fed by the experiences of those who are Indian scientists, but not women, or those who are women scientists, but not Indians, which is why there is a certain universality about the admittedly personal observations in this talk. I should also add that the reason why I am giving this talk in such a distinguished forum is that I am now personally easy about its subject matter; put simply, I am older than I used to be, and this is at least in part the reason that I need to struggle far less than I used to have to, in order to be heard. This, on the other hand, puts on me a responsibility to be able to give voice to the problems of those suffering gender/racial biases which are still ongoing, whose continuing bitterness would not allow them to be taken seriously in a dispassionate forum such as this one. It has also been my good fortune to forge very strong alliances, across the gender/ generational/ racial spectrum, which has helped me to overcome hostility at a personal level; at a collective level, these links have allowed me to be heard with empathy by those whose life experiences on the other side of various divides have been rather different from mine. Let me repeat the question that my French colleague had asked, in a more impersonal way - why are women, and/or people from developing countries treated less seriously in an academic forum (of which science is one, but not a unique example) than a man and/or someone from the developed world would be? Let me add another question: why, in most of the seminars that I attend as a practicing physicist, are many women afraid of asking sensible questions, when many men are not afraid of showing their ignorance rather loudly, or to ask questions which can be paraphrased as 'I ask, therefore I am'? (In the following I will use quotes to denote `women' as shorthand for women/people from developing countries, with in turn 'men' denoting men/people from developed countries). Now, instead of giving the stock answers that are usually produced at this point, let me say that we (`women' as defined above) are late starters in science, and naturally, have not had the cumulative time required to put us as easily at par with our 'male' colleagues. I will admit that just as one is more likely to find students ready for Oxbridge in elite public schools in England rather than in comprehensive schools, one is perhaps more likely to find more natural scientists, trained to perfection in their objectivity, among 'men' than `women'. However, even in this probabilistic scenario, it must be conceded that there might well be some deserving 'women' who have clambered up a rather difficult path and attained a point of some professional visibility. Their reluctance to ask questions at other peoples' seminars or the audience's still slightly patronizing responses to their own seminars, can only be put down to the mind-sets of the audience, which are conditioned (unconsciously, in most cases) to suspect their intellectual training. This is based largely on the following reasoning: given the late starter phenomenon in science, more 'women' than otherwise

would be likely to be weak in their conceptual backgrounds in science, thus more 'likely' to give ill-conceived talks, to ask questions based on amisunderstanding. However, there is also a question of cultural or gender-based diversity. There are ways of self-expression that are unique to 'women', that are distinct from 'men' - for example a certain enthusiasm or impulsiveness of expression is rather more common, even in scientific talks, to people from tropical countries, or to women (regarded as women rather than as 'women'), which carries no external value, and is no more or no less indicative of the content of the talk than the more stony-faced countenance typical of more temperate climes, or of men. Unfortunately, the vast preponderance of the latter among the rungs of successful scientists has created an image of the 'scientific countenance' where scientific objectivity is sometimes linked to a neutrality, or even a lack, of expression and expressiveness.

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Source:http://www.thehindu.com/todays-paper/tp-opinion/Science-education-in India/article14816775.eceAUGUST 16, 2007

Glossary:

Conjure:cause to appear by means of a magic ritual.

Dilettante:a person who cultivates an area of interest, such as the arts, without real commitment or knowledge.

Dabble: dip/ immerse

Heckling: mocking; criticism

Rungs:a level in a hierarchical structure, especially a class or career structure.

Anecdote:a short amusing or interesting story about a real incident or person.

Colloquial:(of language) used in ordinary or familiar conversation; not formal or literary.

Solemn:formal and dignified

Frivolous:not having any serious purpose or value

Confront:come face to face with (someone) with hostile or argumentative intent.

Hostile:showing or feeling opposition or dislike; unfriendly

Enlightened:having or showing a rational, modern, and well-informed outlook

Ascribed:regard a quality as belonging to

Forge:create (something) strong, enduring, or successful

Alliance:the state of being joined or associated

Comprehension

I. Answer the following questions in one or two sentences each

1. What is the tone of 'that sand pile woman'?
2. What caution or alert was given to the author by a French male colleague?
3. What reason does Anita Mehta give for being heckled in the conference?
4. What does Anita Mehta expect when she delivers the talk to the distinguished audience?
5. What kind self-expressionis is unique for women?
6. Identify the prepositions used in the lesson.
7. Identify the articles used in the lesson.

II .Answer the following in not more than a page each

1. What reactions did Anita Mehta face when she started her research ?
2. What, according to Anita Mehta is the status of Women researchers ?
3. Identify the nouns in the lesson and classify them
4. Identify the adjectives in the lesson and classify them.

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Grammar and Composition.

Expansion of Idea

Expansion of an idea is veryinteresting mental exercise, which entails knowledge of complete. It is a kind of specialised composition where only a key sentence is provided to hang the whole composition on. Sometimes these key sentences happen to be famous sayings or proverbs full of practical wisdom. Apparently, they may appear to be very common-place or trite things, but they certainly pose a serious problem before any one who wants to expand one's ideas about these sayings or proverbs.While expanding one's ideas one has to keep in one's mind that relevancy of thought and poise of expression are inevitably required. A redundantly expanded passage appears to be apatch, where one is bound to be exposed to criticism.

A few tips on how to expand an idea or a proverb.

Step 1: Understand the symbol of the words in the proverb
Step 2: Substitute the meaning in the idea or the proverb
Step 3: Look for a story or anecdote or example or illustration
Step 4: Look for similar proverbs or ideas
Step 5: Sum up the paragraph

Step 1: Understand the symbol of the words in the proverb: Most proverbs or ideas are symbolic. The name of a place or animal or thing or person stands as a symbol of some quality. We have to try to understand that in the context of the proverb.

For example, take the example of **'All that glitters is not gold**' Here we have the noun 'gold'. It is the name of a thing. We know that gold is a precious metal. So what does gold stand for? It stands for precious.

Step 2: Substitute the meaning of the idea or the proverb:
Take the example, 'All that glitters is not gold'. Now substitute the symbols we found out earlier in the sentences. What do we have?

'All that glitters is not precious'

The proverb is now decoded and ready for understanding.

Step 3: Look for a story or anecdote or example or illustration: Now that you have understood what the proverb stands for or what the proverb means, we should look for a suitable example to illustrate it.

Step 4: Look for similar proverbs or ideas: the proverb 'Do not judge the book by its cover' similar to 'All that glitters is not precious'.

Step 5: Sum up the paragraph: Use summing up words or phrases to indicate that you have finished the expansion and intend to sum it up. You could use 'Thus' or 'In fine' or 'So' or 'The proverb advises that'. Let the reader know that you are signing off.

Lok at the following example

Cut Your Coat According To Your Cloth

If you give a piece of cloth to a tailor to make a coat, the tailor will first measure the cloth and then decide what kind of coat has to be made out of it. He will not be able to make a coat that requires more material than the cloth provided. The same is the case with our expenses and income. Our expenses should always be within the limits of our income. Otherwise, we surely land in debt and difficulties. The proverb thus tells us not to spend more than what we

earn i.e., to live within our means.
The proverb applies not only to individuals but also to the business establishment. Of course, a company may raise a loan to expand or diversify its business. But it must do it judiciously; otherwise, it will be in deep trouble. Even the government of a country has to keep in mind its total resources while spending. If it does not do so and goes on borrowing recklessly from the people and from foreign countries as Pakistan government is doing so since decades, it would become bankrupt one day, and come to grief.

So the proverb is of universal application. It teaches us that our actions should suit the circumstances or resources. The wisdom of the proverb would guide everybody to live and work within their means and to avoid possible shame or punishment resulting from living beyond their means.

Expand the following Proverb:

As You Sow So you reap

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