Panini- The Greatest Intellect of Sanskritic Traditions

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1.Introduction

The fact that Panini stands as the greatest linguistic and grammarian of Sanskrit can be contemplated by merely seeing the present form of Sanskrit language and the impact which Panini had on this ancient language, becoming the sole person on whose treatise the present day grammar and linguistic rules stand upon. It is often said that even if the entire glossary of Sanskrit gets vanished, it can be revived solely from the *'Ashtadhyayi'* of Panini. This is the extent of impact which Panini had not only on the language but on the entire thought system of Bharatvarsha.

In this research paper, we will get an insight into the grammatical and linguistic contributions of Panini along with the historical and scientific significance his grammar holds. At the same time, we will discuss about his extraordinary intellect due to which he stands as one of the greatest personas of our ancient history. The grammar propounded by Panini not only amazes one but makes us feel proud of the unparalleled legacy of our great sages.

2. Life History And Works

Panini was born in Salatura village of Attock, present day Pakistan. He is often referred to as *'Salaturiya'* by Patanjali. There are differences among the scholars upon his time period, which is considered as 500BC by most of them occasionally opposed by others who keep it between 700BC- 600BC. He was familiar with the entire Vedic literature as stated by Paul Thieme. He is supposed to have written an epic too by the name

'Jambvativijayam' but it remains a mere assumption devoid of any solid proof. No further detail about his life is availed and we only have the privilege to have his works preserved along with the detailed commentaries written on them.

Talking about his works, we see that 'Ashtadhyayi' is the major treatise written by him which remains as the greatest work in Sanskrit language. He also wrote several Appendix books which assisted in grasping the propounded notions of Ashtadhyayi. These were – *Ganapath, Dhatupath, Linganusasana and Unadisutras*. These are collectively referred to as *'Panchpathi'*.

We are told of ten grammarians prior to Panini as quoted by him whose works and grammars have been long lost with time. But, Panini's Ashtadhyayi remains the most revered and respected one as he not only just wrote the most extensive treatise but also ensured that it was an inclusive one without keeping any prejudices or biases prior to the writing of the text. This statement fits aptly here-

"The first text on linguistics available to us is the Sanskrit grammar of Panini. As irony would have it, this book, perhaps the first scientific work in western history, remains without equal in its field even today."

—"Encyclopaedic Dictionary of the Sciences of Language", Oswald Ducrot and Tzvetan Todorov

Ashtadhyayi comprises a total of 3,978 sutras and 14 Pratyahar sutras. It is written in sutra style and is divided in 8 chapters which are further divided in 4 padas. The subject matter is presented in a very scientific way keeping in mind the background and scientific techniques as *anuvritti* are used (this shall be discussed later on.)Panini did an unmatched and the most extensive survey of the language of his time

including all the words of popular usage as well as the words used in the Vedic literature, on the basis of division in two categories- *Vedic* Sanskrit(language used in the Vedas) and *Laukik* Sanskrit(language of popular usage)

According to Ashtadhyayi, there are five units which form the base for the grammar of Sanskrit, their names in increasing order of complexity is: *Varna* (sound), *akshara* (syllable), *shabda* (word), *pada* (a compound word or a phrase) and *vaakya* (sentence). **(A reminder: Panini didn't destroy lingual diversities with his Sanskrit grammar; he unified them- Devapriya Roy)**

A short discussion should also be done on the grammatical and linguistic contributions of Panini through his Ashtadhyayi, which will help us, ascertain his primary role of a grammarian.

Panini laid the foundation of his grammar by 14 Mahesvara sutras also known as Pratyahar sutras which classify all the Sanskrit alphabets. Classifying the *Vyanjanas* (consonants) under *Antsth Sparsh* and *Ushma* reflects the great sense of phonetics which Panini portrayed. Also, He has in detail described the rules of *Sandhi* (combination) in chapters 6 and 8 clearly specifying all the rules and regulations of changes which words should undertake.

His main focus is on the etymology. He states that words are of two kinds- *Subant* and *Tidant* and in explaining them, he brings forward all kinds of words whether simple or complex. In this sense, it will not be an overstatement to say that Panini is the original promoter of Descriptive Linguistics.

Even in discussing the word formation and etymology in a great depth, he continuously keeps it related with the meaning of what has been

propounded and in this sense, he has analysed the language on an enriched philosophical basis which gave grammar a philosophy of its own. This further provided a base for the preceding scholars like Patanjali and Katyayan who developed an entire philosophy of *vyakaran* (grammar) complying with the concept of *Shabd Brahma* (the word is ultimate authority Brahma itself) (संस्कृत साहित्य का इतिहास- डॉ उमाशंकर शर्मा 'ऋषि')

The fact that Panini accepted views from all schools of grammar and considered simplicity as the chief element in his treatise had led to the wide acclamation of Ashtadhyayi.

Paul Kiparsky of Stanford University says upon this –

"Theoretical linguists of all persuasions are in addition impressed by its remarkable conciseness, and by the rigorous consistency with which it deploys its semi-formalized metalanguage, a grammatically and lexically regimented form of Sanskrit. Empiricists like Bloomfield also admired it for another, more specific reason, namely that it is based on nothing but very general principles such as simplicity, without prior commitments to any scheme of "universal grammar", or so it seems, and proceeds from a strictly synchronic perspective."(On The Architecture of Panini's Grammar)

Hence, Panini not only gave Sanskrit its most elaborate grammar but also included all the usage variations of his time and brought all the ranges under one umbrella. The fact that he accepted all the schools in an unbiased and open manner gives him unchallenged respect of the grammarians who followed him. He respected the views of the scholars previous to him like Shaktayan and Indra and added new theories from his own observations.

3. The Era of Panini as Depicted by Him

Panini did not just mention all the grammatical operations and rules but his other work appendix works are also of great significance. One very significant thing which we shouldn't forget is that he interacted with the society and people of his times and collected thousands of words from their diverse lives, by this he identified that many words had become prevalent in popular usage but their root forms couldn't be recognised. We can clearly see such instances from Dhatupath where he has given 1943 dhatus (root forms) of the words used in language. In the collection of these dhatus, we can easily see numerous references to the socio-economic and demographic information of that time.

He gives name of those 500 villages which have been referred to as the villages having a population of 10,000 in Punjab region by the Greek historians. He has described the *gotras* present in the society which had increased to a large numbers. Describing this, he gives various family names and tells how sons, grandsons and other kin relatives were named.

We also see mentions of the ganas and various tribal groups in his works and he has used two adjectives 'Vrat' and 'Poog' for the tribal groups which indulged in loot and warfare which stands historically correct. **(पाणिनिकालीन भारतवर्ष- वासुदेवशरण अग्रवाल)**

Going back to Ashtadhyayi; we see the description of origination of thousands of words in its fourth and fifth chapters respectively. Panini interacted with people from all walks of life- soldiers, merchants, farmers, shepherds, carpenters, cobblers, blacksmiths, and goldsmiths and of other occupations and collected words used by them in their occupations. Hence, this served as a survey of the socio- demographic conditions of his times, and is undoubtedly of a great historical significance. He even surveyed the coinage practiced in markets and

comes out with all the various types of coins used. Cattle like cows and ox also find a detailed mention in his works. In short, Panini's works are not just of theoretical grammar, but directly connects the grammar with the common people, clarifying the fact that <u>Sanskrit was very much the language of the masses at that time.</u>

This entire detailed survey and description makes his works as an ancient encyclopedia of Indian society and common life, something which is hard to find in static sources of history. This also emphasises on the in depth study he did and the magnitude of the importance and significance of 'Panchpathi'.

4. Panini as a Scientist of Grammar

Till now we have discussed about the grammatical notions of Panini in linguistic as well as in historical terms, and it is quite clear that he has been the most ancient and the greatest linguist human history has ever seen. But, there is another perspective to Paninian grammar which can amaze any person and which has widely drawn the attraction of scholars in modern times; that is, the scientific nature of the sutras he formulated and how they are exactly like a structured software program language. The very scientific nature of his grammar can be seen from this fact-

"The entire text is arranged into eight chapters (the eponymous ashta adhyaaya*s), with each chapter subdivided into four parts. At the heart of all this richness, amazingly, is a 14-sutra long algorithm. Yes, a mere 14 sutras."

(A reminder: Panini didn't destroy lingual diversities with his Sanskrit grammar; he unified them- Devapriya Roy)

The Siva sutras which are being talked about are a linear arrangement containing the alphabets of Sanskrit language and the fact they are a

long algorithm forming the base of the entire text, gives us a sense of the scientific applications which have been used. Weibke Petersen has proved mathematically that the solutions given by Panini are optimal in nature. Dr. Amba Kulkarni comments that Panini has used only a total of 55 bytes through his scheme, which would have been 1600 bytes otherwise. He provided a method of naming various slices by an acronym with two letters, the first letter being the first phoneme in the slice and the last being the marker. **(Panini- world's first informatician- Suganthy Krsihnamachari)** This scheme helped him achieve brevity, simplicity and scientific perspective.

To understand this concept, let us take an example of a technique called 'anuvritti' (repetition) used by Panini to include that simplicity or brevity in the sutras. He implied this technique similar to factorization where the common term is factored out. This can be seen by taking these two sutras as an example-

upadese ac anunaasika it (1.3.2)

halantyam (1.3.3)

The first sutra says – "As said in the teachings of Panini (*upadese*), the nasalised (*anunaasika*) vowel (*ac*) is termed "it"."

The second sutra says- "The consonant (*hal*) in the end (*halantyam*)"

Now, upon borrowing upadese and it from the first sutra, the second sutra will read-

"As said in the teaching of Panini, the consonant (hal) in the end of a string is termed "it" "

This process of repetition is called anuvritti and it made the sutras simple and clear by avoiding continuous repetition of words and at

the same time, avoiding any sort of complexity in the meaning derived.

This particular repetition which we saw as an example is used by Panini from sutras 1.3.2 to 1.3.8. Due to this practice of '*anuvritti*', Panini had to use just 7000 words which would have been a total of 40,000 adding the repeated words of anuvritti. Due to this, he needed to use only an approximate of one sixth of the total words with anuvritti. In mathematical terms, he achieved compression by a factor of 3 in terms of byte size, which made the memorisation easier. **(Panini- world's first informatician- Suganthy Krsihnamachari)**

Thus, it becomes evident that Panini had kept information coding in mind, forming completely new information dynamics in a language. All this has led to the comparison of Panini's grammar with the Turing Machine, an idealized mathematical model used in computing devices.

Gerard Huet who led the teams which developed programming language CAML and Coq Proof Assistant System, rightly said that Panini was the "first informatician in the world 24 centuries before computers came into existence," which sums up the dynamics of informatics and scientific operations which Panini comprised in his sutras.

5.Reflection and Conclusion

As we come to the end of this paper, we understand that the contributions of Panini are not only momentous but unparalleled since their inception. The grammar propounded by him gave an umbrella to the entire range of the Sanskrit variations which brought together the cultural diversities and various elements of our civilization together. He should be undoubtedly credited for the fact that Sanskrit has endured

all ups and downs and is still present as the symbol of our glorious civilization.

The grammar propounded by him is not only voluminous but is extraordinary in terms of grammatical operations and the wide range of vocabulary which it comprises. This led Maurice Bloomfield, a renowned western philologist and Indologist to say – **"Panini's work is the greatest monument of human intelligence."**

The mathematical applications which we saw and discussed about, is something which has its own scientific significance in the present day and can be of a great importance to the scientific varsity; but, at the same time, lest we forget that we ought to take pride in the unparalleled developments our Bharatvarsha has endured in those ages, which are unchallenged even in the 21st century. Panini's solutions and algorithms states a fact in very clear terms, that Indian intellect had gone much deeper than simple schemes of things and had discovered concepts such as the grammatical philosophy of Panini.

Here, we should also think about two more aspects which are again of relevance to us. Firstly, the relevance of Panini in the present day era as a grammarian, intellectual and thinker and, how his great contributions can lead to nation building.

I would firmly associate Panini's relevance with the relevance of our *devbhasha* Sanskrit which needs to be revived and promoted if we want to revive our Bharat in true senses. Panini asserts us to think on the revival of Sanskrit and its importance, which should have been done much before. The various scientific aspects of Paninian grammar leave no argument on the fact that Sanskrit has a great scope and opportunities for our country.

Unarguably, Information technology and software sciences are gaining importance every single day and the connection of Panini with these complex sciences is not just a thing of gone past, it is both relevance and a great opportunity. Scholars have unanimously agreed that these algorithms can be of various uses to the software language, and India, as the home of Sanskrit, should explore and identify opportunities in this field.

Another thing which should be understood; our nation building is irreversibly connected to history writing of our past and the works of Panini emphasise on the need to go beyond static sources to re write the glorious history of our nations. We ought to go back to our texts and scriptures for understanding Bharat in complete senses and Panini's works are just one of the many instances where history is presented through the subject matter which author has chosen. Panini is both an example of our great history as well as of the fact that 'Idea of India' is what our sages have said, not what a section of scholars gave to fulfill its agendas. Hence, this sums up the relevance of Panini to the 21st century India, and the need for understanding it for the purpose of nation building. There have been numerous in-depth researches on Paninian grammar, and this paper only aims at indicating the significance of that great grammarian, reflecting the philosophy of our great sages.

Bibliography

1. पाणिनिकालीन भारतवर्ष- वासुदेवशरण अग्रवाल (चौखम्भा प्रकाशन)
2. संस्कृत साहित्य का इतिहास- डॉ उमाशंकर शर्मा 'ऋषि' (चौखम्भा प्रकाशन)
3. On the Architecture of Panini's Grammar- Paul Kiparsky (Research Gate)
4. Panini- world's first informatician- Suganthy Krsihnamachari (The Hindu)
5. A reminder: Panini didn't destroy lingual diversities with his Sanskrit grammar; he unified them- Devapriya Roy (The Scroll)

6. Britannica
7. Encyclopaedic Dictionary of the Sciences of Language- Oswald Ducrot and Tzvetan Todorov- archive.org