India’s Contribution to Linguistics

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The three worlds would be completely enveloped in blinding darkness if not illumined to its complete extent by the light called word.

- Dandin, 7th Century CE
Agenda

• What is Linguistics?
• Linguistic thought in India
  – Emphasis on Sanskrit and the Vedic tradition
• Contributions of Indian Linguists
  – Learn Sanskrit!
• Relevance to modern times
Linguistics – Scientific Study of Language

- **What is Language?**
  - Set of symbols, associated with meaning, with rules to manipulate them
  - Set of rules for generating and understanding speech
  - Expression of human communication through which knowledge, belief, and behavior can be experienced, explained, and shared

- **How does language work?**
  - How is it represented in the mind?

- **What are common elements of all languages?**
Areas of Linguistics

• Theoretical
  – Phonetics: Sounds of a language
  – Phonology: Sound patterns
  – Morphology: Word formation and structure
  – Syntax: Sentence structure
  – Semantics: Study of meaning

• Applied
  – Understanding and teaching other languages, translation, speech therapy
Linguistics in the West

- Sir William Jones (18th century)
  - Noted striking similarities between Sanskrit, Greek, Latin, and Celtic
  - Comparative Linguistics

- Modern Linguists
  - Ferdinand de Saussure (1857 – 1913)
    - Language Structure
  - Noam Chomsky (1928 - )
    - Generative Grammars
Linguistics in India

- Very ancient tradition
  - Great emphasis on correct speech
  - *mleccha avyakte śabde*

- Literature
  - Vedas
  - Prātiśākhya
  - Nirukta (Yāska) ~ 800 BCE
  - Aṣṭādhyāyī (Pānini) ~ 600 BCE
  - Mahābhāṣya (Patañjali) ~ 150 BCE
  - Vākyapadīya (Bhartṛhari) ~ 500 CE
References in the ṚgVeda

- **X.71 – Jñānamā**
  
  उत्त त्वः पश्यन् न दंदर्श वांढङ्गुत त्वः शृशवन् न श्वशोऽयनाम्।
  
  उतो त्वस्मे तनवं वि सङ्ग्रे जायेव पत्यो उश्ती सुवासोः ।

- **X.125 – Vāgambhrṇī**
  
  यं कामये तत्त्वमुर्ग्रं कृषोमि तं ब्रह्माण तमृषिं तं सुमेधाम्

- **I.164 – Asya Vāmasya**
  
  चत्वारि वाक परिमिता पुरानि तानि विदुब्राह्मणं ये मन्त्रीषिद्।
  
  गुहा श्रीश्च निहिता नेध्यंति तुरीयं वाचो मनुष्यों वदन्ति ॥४॥
Observations on Language

- Language can be defined by a set of **rules**
- Rules must explain
  - Existing usage
  - Future usage
- Rules must be precise
  - Rule application defined by **metarules**
- Separate conceptual (abstract) representation from expression
Language Structure

- Sound and pronunciation (Śikṣā)
- Varṇa – basic unit of sound
  - Precise definition of attributes
  - Sanskrit has no sound that is indistinct
- Rules of saṃdhi
- Pada (word)
- Vakya (sentence)
  - Bhartrhari considers the sentence as the basic unit of communication
  - Sentence-meaning is primary, and the word-meaning the result of rather artificial analysis
Important Concepts

- Kāraka – कारक
- Samāsa – समास
- Taddhita – तद्धित
- Kridanta - कृदन्त
Kāraka - कारक

- Abstract model of semantic relationships
- Fundamental idea expressed by action (kriyā)
- Relationship to action
  - Kartā - agent
  - Karma – direct object
  - Karaṇa – instrument
  - Saṁpradāna – indirect object
  - Apādana – that from which departure takes place
  - Adhikaraṇa – location, substratum
- Vibhakti – Expression of relationship
  - Indicated by case endings (prathamā, dvitīyā, etc.)
  - All other relationships - şaṣṭhī
Samāsa - समास

- Compound words
- Types
  - Avyayībhāva, Tatpuruṣa (Dvigu, Karmadhāraya), Dvandva, Bahuvrihi
- Elaborate rules on formation
  - Order of words
  - Distinguishing using accent
  - Samāsa vigraha
- Modern Examples
  - Database, Internet, Workspace, White-collar
Taddhita - तद्धित

- Noun Derivatives – adding pratyaya
- Used to indicate
  - Descendant (Tasyāpatyam)
    - Dāsharathī, Vaishwamitra
  - Having that quality (Tasya bhāvastvatalau)
    - Hindutva, Samatā
  - Someone’s teaching (Tena proktaṁ)
    - Pāṇiṇīyaṁ
- Examples in English
  - Suffixes such as -ness, -ity, -tion, -dom
Kridanta - कृदन्त

- Verb Derivatives
- English
  - Accept – acceptance
  - Go – going
  - Pay – payment
- Uṇadi Sutras
  - Vāyu

Ancient tradition
Pānnini, Vararuchi, Patañjali
Conceptual Model
Bhartrihari (6th Century CE)

- Linguistic Philosopher
- Possibly identical to the author of the śatakatraya (nīti, śṛṅgāra, vairāgya)
- Major Concepts
  - Vyākarana is a Darśana
  - Language is the only key to knowledge
  - Identifies shabdatattva (speech principle) with Brahman
  - Sphota theory: What the speaker utters and the listener listens is vākya sphota (complete meaningful sentences)
Vākyapadiya Organization

- Brahma kāṇḍa
  - Nature of śabda which is proclaimed to be identical with Brahman as well as the principal means to attain it

- Vākya kāṇḍa
  - Different attitudes towards the sentence vākya. The sentence is the real meaning-bearer, whereas the meanings of the single words are artificially inferred from it

- Pada (Prakīrṇa) kāṇḍa
  - Issues dealt with by the other philosophical traditions, including the problems connected with padārthas such as jāti, dravya, and kāla
The affairs of the word are carried out by the eternal and indestructible being, manifesting itself through meaning and expression.

Words alone are the means to express something that is desired. Understanding of the essence of words is not possible without recourse to linguistics (Vyākaraṇa).
Stages of Speech

- **Vaikhari** – Elaborated, Expressed
- **Madhyama** - Mediating
- **Pashyanti** – Seeing, witnessing
- **Para** – Transcendental (term not used in VP)

This is the amazing, supreme abode of speech, manifesting as vaikhari, madhyama, and pashyanti, and divided in multifarious ways.
Modern Applications
Examples from Web 2.0

• *Sneak in an extra vowel, drop in a consonant* - welcome to the lexicon of web 2.0
  • *varṇa āgama*: bhīma -> bhīśma
  • *varṇa viparyaya*: hiṁsa -> siṁha
  • *varṇa vikāra*: r->l, taruṇa taluna
  • *varṇa nāśa (lopa)*: klish + a -> kesha
  • Example: blog
    – *(world wide) web + log*
Computational Linguistics

• Natural Language Processing
• Goals
  – Communicate with computers using natural language
  – Software should listen and speak
• JNU Research Center
  http://sanskrit.jnu.ac.in/index.jsp
  – Tools and technologies for translating between Sanskrit and Indian Languages
India has had a long tradition in Linguistics

The Sanskrit language incorporates many sophisticated linguistic concepts

Studying Sanskrit can greatly benefit understanding of language

Computational Linguistics can use concepts from Sanskrit
Thank You

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