

Early Indian Coins

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Coins are the vital source for reconstruction of the cultural history of a country, and are indispensable for India, which is rather devoid of records to reconstruct its early history. Coins can be viewed from various angles and be effectively used to weave not only the economic history of the time, but also know about the dress, ornaments, crown, hair-style, weapons, polity, religion, beliefs, art, trade, transport, language, script, science, technology and much more. Hence, the information provided by coins is inevitably useful as these are directly related to the society and reflect the prevailing culture in which they are circulated.

Origin of Indian Coins

Origin of Indian coins has been a debatable issue among the scholars. Three factors should be considered while deciding about the origin of coins, viz., Time, Contact and Similarity. The important views in this connection are :

- (i) **Greek Origin :** The supporters of Greek theory believe that coinage in India started after the invasion of Alexander. But this theory goes wrong when one learns that punch-marked coins already existed in India when the Greeks invaded. A Greek scholar Quintus Curtius Rufus himself mentioned that Āmbhi had presented eighty silver coins to the invaders along with other items. A coin hoard found from Bhir mound near Taxilā contains Greek coins in fresh condition, along with Indian punch-marked coins in damaged condition proving their long circulation. Such evidences shatter the theory of Greek origin of Indian coins.
- (ii) **Achamanian Origin :** Some scholars hold that Indus and Kāndhāra were the two provinces of the vast empire of Persian ruler Darius, and therefore, his coin types must have been imitated by the Indian technologists. This theory also falls flat, as there is no similarity between the two currencies. Moreover, the script found in Persia is absent in the Indian system.
- (iii) **Babylonian Origin :** The scholars who favour Babylonian origin of Indian coins are of the view that trade contact between India and Babylon was already established in the pre-Buddhist era, and this is supported by the early **Bāveru Jātaka** episode, which describe the conditions of pre-Mauryan age. This theory is also shattered in the light of the fact that not a single *shekel* of Babylonia has been reported from the Indian territories. Moreover, the earliest date of 525 B.C. has been assigned to *shekel*, and Indian punch-marked coins are available at least from the same period along with the Northern Black Polished Ware (NBPW) from the excavations. Hence, the question of imitation of Babylonian prototype does not arise.

After carefully reviewing the theories of foreign origin, only the indigenous theory of Indian origin of the Indian coins remains safe.

Antiquity of Indian Coins

When did the coins really start in India is not certain. Most of the scholars believe that

in ancient times, the trade was done through barter-system (mutual exchange of items). It is rather surprising that how the developed civilization of Indus Valley could do without coins? Archaeologists suggest that the huge granaries found at Harappa and Mohenjodaro indicate towards the fact that people used agricultural products as their medium of exchange.

Pastoral Vedic people used their cows as the medium of exchange as gathered from the Vedic literature. But the problem was that cows could not be used for purchasing small items, as they could not be divided. The alternative medium was the *niṣka*, which in the **Rgveda** has been explained as some kind of necklace or ornament. Rudra is described as wearing a *niṣka*. In another hymn, *Ṛṣi Kakṣivat* says that he obtained ten *niṣkas* from king Bhavya. In the **Atharvaveda**, a poet praises his patron who gave him hundred *niṣkas*. The references in other texts also bespeak of the use of metal as a medium of exchange.

The introduction of metal as medium of exchange brought with it the problem of measurement. Seeds were found to be fairly uniform in shape and size, and thus, selected as a standard unit to weigh the metal. In the **Taittiriya Brāhmaṇa**, a *kṛṣṇala* (seed *abrus precatorius*) is said to be given to each participant of the chariot race organized during the *rājasūya yajña*. Probably, it was a lump of gold or some other metal weighing equal to one *kṛṣṇala*. In the later literature, *kṛṣṇala* was known as *raktikā* or *guñjā* and continued to be known as *rattī*. *Yava* (barley), *taṇḍula* (rice) and *māśā* (pulse) were the other grains used as units for weighing metals.

In the **Rgveda**, there is a term called *manā*, and in the Babylonian literature, we come across a word *minā* (a coin). The question arises whether there was any relation between the two? The *manā* is not referred to elsewhere, hence, becomes doubtful. In the **Śatapatha Brāhmaṇa** and **Śrautasūtras**, a term *hiranya* (money) is found along with a word *māna* (unit). The word *satamāna* (hundred units) is clearly mentioned as a metallic round piece, which weighed hundred *rattis*. In the **Bṛhadāranyaka Upaniṣad**, a metallic piece is mentioned whose one-fourth is referred to as *pāda*.

Pāṇini's **Aṣṭādhyāyī** (datable to the 5th century B.C.) proves to be a landmark in this connection, and it talks about the owner of hundred *niṣkas-naiṣkikam satikām*. It is almost certain that by the time of Pāṇini, *niṣkas* became some sort of currency. Subsequently, we come to **Jātaka** stories, assigned between pre-Buddhist era to the Gupta period, where most of the evidences refer to *niṣkas*, *svarṇas*, etc. A very small denomination was *kākaṇi* for which a dead mouse could be purchased for the cat. In Pāli literature *kāhāpaṇa* is mentioned, which was equivalent to *Kārṣāpaṇa* of the Sanskrit literature. The **Arthaśāstra** of Kauṭilya refers to *hiranya*, *piṇḍaka*, etc. in which taxes were paid. Beside *kākaṇi*, the **Jātakas** also mention *kṛṣṇala* (five *kṛṣṇala* = one *māśā*; one *kṛṣṇala* = one *tolā*). In the **Arthaśāstra**, **Manusmṛti** and **Yājñavalkya Smṛti**, the measurements of various coin types are also given, viz., goldcoin = 80 *rattis*; copper-coin = 80 *rattis* and silver-coin = 32 *rattis*. South Indian coins had a different name for *ratti*, i.e., *mañjādī*.

So far as the literary evidences are concerned, the references of pre-6th century B.C. are doubtful, but after 6th century B.C. the references are found to be solid and definite as mentioned in **Aṣṭādhyāyī**, **Arthaśāstra**, **Jātakas**, etc. Archaeologically, the earliest Indian coins are the punch-marked coins datable between the 6th century B.C. and 1st century B.C.

Punch-marked Coins

Punch-marked coins are the earliest, crudest and simplest form of currency in India. This nomenclature was first coined by James Prinsep in 1835 A.D. and continues till date as no

better alternative has so far been found for the same. There are mainly four types of punch-marked coins:

- (i) **Ingots** : A lump of metal with one impression. Such coins are scanty.
- (ii) **Bent-bars** : Found only in north-west India, bent-bars roughly weigh around 180 grains. They can be divided into two groups larger and smaller. The smaller ones may be half the value of the larger and have only one symbol. The Chaman Huzuri (Afghanistan) hoard contained the early coins of the Achemanians, but the bent-bars are the only coins, which are punched.
- (iii) **Cup-shaped** : These are very few in number and found only from eastern Uttar Pradesh and Shahabad district of Bihar.
- (iv) **Rectangular/Square** : These are the most common type of punch-marked coins which have been found in thousands, scattered all over the country. Generally in silver, these have irregular shape. A detailed study revealed that people were more concerned about the weight of coins, and not for their shape and size. The efforts were made to maintain the weight around 32 *rattis* by cutting and clipping the edges. Thus, the coins acquired all types of irregular shapes.

As far as the date of punch-marked coins is concerned, they have been found from the lower levels (not the lowest) of NBP layer dating approximately to 6th century B.C., which can be inferred as the starting date of these coins. Symbols on some coins were badly rubbed off due to long time circulation, hence, they were punched again. Few coins have even more punches. These coins continued upto about 2nd century A.D.

The early Indian punch-marked coins bear no inscription, but only symbols. The important symbols are geometrical, human, animals, fish, tortoise, scorpions, birds (peacock easily identified), trees, plants, flowers, hills, rivers, *caityas*, sun, moon, stars, etc. The scholars have explained them as royal authority or gems, *tāntrika* innovations and for auspiciousness. The gold punch-marked coins cannot be proved at the present state of our knowledge.

Other Techniques

Besides punching, we find two other important techniques used by the manufacturers of early Indian coins, viz., casting and die-striking.

Casting : In ancient times, the inscription or symbols were not engraved, but were made in relief. The negative impression of the legend (inscription) and device (symbols, etc.) were engraved inside the mould (made of clay) for this purpose. Initially, single moulds were used, but later on double moulds were made to get obverse and reverse of the coins. In the beginning, one mould was used for a single coin and it was destroyed when the metal piece (coin) was taken out of it. Hence, a separate mould had to be made for each coin. Subsequently, a device was introduced where a number of moulds were used simultaneously and the molten metal was poured through different canals, thus, obtaining several coins at a time. Birbal Sahani, a renowned Palaeobotanist, discovered several such devices (moulds) from Sunet and Rohtak (Haryana). Unfortunately, no metal mould has so far been recovered.

Die-striking : The die-striking technique became more popular as large number of coins could be produced out of it. Initially, single die-strike (one sided) coins were made, but later both sides were given shape. Whether the double die-strike technique was introduced by

Greeks or by Indians, is an issue open to debate. Die was generally made of iron. The other side (reverse) of the coin was engraved in negative on the anvil itself. This technique continues till date only with mechanical improvement.

Both casting and die-striking method of preparing coins were used since 2nd century B.C.

Repousse: Another technique of making coins is called Repousse in which the legend/device is raised in relief by hammering from behind or within, but extremely rare specimens have been found of this device.

Issuing Authorities

Scholars have made several interpretations regarding the issuing authorities of the coins. They are as under:

Guilds : Some coins are identified as coins of the guilds or *nigamas*. Such *nigama* coins are found from Taxilā. The word *nigama* means a guild as well as a town. It is presumed that such coins were circulated among the guilds only. The *nigama dojaka*, *nigama tālimātā*, *nigama atikatā*, etc. have been noticed recorded on these coins. Now the point of argument is that whether the words *dojaka*, *tālimātā*, *atikatā*, etc. are names of the guilds or of the towns. Some scholars regard these as the names of head of the guilds. Whatever may be the case, Taxilā *nigama* coins have very clear legends on them. *Nigama* coins are also found from Kośāmbī. One coin reads *gadhikanarṇ* (*gandhi* signifies perfume). Now whether this coin was issued by a perfume guild or not is again a debatable issue among the scholars.

Cities : Introduction of legends on the coins started around 2nd century B.C. in India. Some coins are recovered from Maheshvar situated near Narmadā River in Madhya Pradesh. The legend reads *mahiśmatī*, which may be *maheśvatī*. Similarly, legend on coins found from Rājghāt (Varanasi) reads *bārāṇasī*. Other examples are *kosabī* (Kośāmbī), *erakaṇya* (Eraṇa), *vediśa* (Vidiśā), etc. All such legends on the coins indicate that coins were also issued by some city-states in ancient India.

Tribal Republics : The government in these cases was not run by a single person (king), but by a number of people. The legends, like, *mālavājaya* (Mālava), *yodheyagaṇasyajaya* (Yodheya), *odumbaris* (Audumbara), etc. are examples of the coins issued by some tribal republics. The smallest coins (copper) of the world are found from the Mālavā region.

Deity Coins : Sometimes, the whole kingdom was dedicated to some or the other deity. This fact is known from the legends like, *chattreśvara mahātmanaḥ*, where the whole kingdom was dedicated to *Chattreśvara* or *Śiva*. In Travancore, it was considered that king was not a ruler, but *Padmanābha* (representative of Lord *Viṣṇu*). Such coins are quite prominent where king is regarded as the representative of some or the other deity.

Beside the above-mentioned authorities, as is the general impression, coins were certainly issued by the kings and their subordinate monarchs also.

Indo Greek Coins

It is a wrong notion that Greeks came and settled in India (Indo-Greeks) only after Alexander's invasion in the 4th century B.C. The Athens Greeks were already present in the regions of Bactria, Afghanistan, Punjab and Sindh when Alexander invaded, who was a Macedonian Greek. In the present day context, India remained untouched by Alexander's

invasion. It is interesting to learn that only four or five Greek rulers are known from literature who ruled in India, but coins unfold the existence of about forty Indo-Greek rulers.

The Indo-Greek coins are found in gold, silver, copper, billon, nickel and lead. The numismatic evidence is corroborated by **Mahābhāṣya** of Patañjali and **Gārgī Samhitā** as well. These coins are round in shape, aesthetically improved, and clear figure of the kings and deities. They were made with die-struck technique and double moulds were used, where reverse used to be engraved on the anvil itself. One die was used to make only one coin; afterwards, the die was disposed off.

The gold coin of 132 grains was known as *stater*. The silver coin was known as *drāchm*, which was later called *dāma*, and its small denomination was known as *damaḍi*. The copper coin was known as *chalcon*. A twenty *stater* gold medal of Eukratides was found from Balkh (Bukhārā). One *stater* gold = 20 *drāchms*; *tetra-drāchm* = 4 *drāchms*; *di-drāchm* = 2 *drāchms*; *heli-drāchm* = 1/4 *drāchm* and *obol* = 1/6 *drachm*. Nickel coin is equal to approximately 134.4 *drachms*. Silver coins are found with 95% purity. Gold and silver coins are generally round in shape, whereas square coins are mostly in silver and copper.

The kings on the obverse of Indo-Greek coins are shown facing right with two types of portraits—head and bust. They have didrum, kausia, *gajakapālamuṇḍa* or helmet on their head. King's name and title is given on reverse along with the figure of a deity, owl, horse-rider, bull, etc. There are number of deities depicted, like, *Zeus*, *Athena*, *Poseidon*, *Nike*, *Heracles*, etc. Notable coins are those of Strato in which he is represented from his youth to the old age. Pedigree coins are also found. Legends are mostly met within relief in Greek letters. Gradually, Kharoṣṭī was adopted, and later Brāmhī letters were also introduced. The legends read *basilios basilion* (king of kings), *theos* (god), *aniketos* (invincible), *megalloi* (great), *soteris* (protector), *dikios* (religious), *niketa* (conqueror), *phillopetor* (dear father), etc.

Śaka and Pahlava Coins

Some of the nomadic warrior tribes of Central Asia, when uprooted from their place of origin in the Chinese territory, migrated to south-west, reaching Oxus region and Bactria. They defeated Hipostratus and Hermeus (last Indo-Greek rulers) and captured Bactria around 135 B.C. From there, they advanced to Afghanistan, Sindh, Punjab and Central India. The chief clans were Scythian (Śaka), Parthian (Pahlava) and Kuei-shuang (Kuṣāṇa).

Maues was the first Śaka ruler in the Punjab and adjoining areas. Almost contemporary was Vonones, the first Pahlava king, who ruled over the regions of Kandahāra (Arachosia) and Baluchistan (Gadrosia and Drangiana). Most of the coins of Śaka and Pahlava rulers retain the Bactrian devices, which were then current in the Indian territories. The unique addition is that almost all Śaka and Pahlava rulers used *aśvārohī* symbol on their coins signifying their nomadic nature. Maues has not given his portrait (head or bust) on his coins as the Indo-Greek rulers did. Śaka and Pahlava coins are found in silver and copper.

Initially, the legends were in Greek, like, *basilios basilion magaloy Mayou*, but gradually, the legends changed to Prākṛit language and Kharoṣṭī script, like, *rajatirajas mahatmas Moas*. A male depicted with trident and club is identified as *Śiva* by some scholars, but others refute it. The important rulers, whose coins are found, beside Maues and Vonones, are Spalyris, Spalagadama, Azes-I, Azilizes, Azes-II, Gondopharnes, Indraverma,

Aspavarma, Sasa, Sapedana, Satavastra, Abdagases, Orthagnes, Pacores, Gondopharnes-II, Arcaces and Sanabares. The silver coins of Azes-I are *tetra-drachm* and *drachm*.

The Greek deities depicted on the Śaka and Pahlava coins are *Zeus*, *Heracles*, *Nike* and *Pallas*. The other figures include double-humped Bactrian camel, elephant head, humped bull, *Gajalakṣmī*, horsemen, etc. Śaka and Pahlava rulers introduced the *kṣatrapa* system on their coins, which was adopted and continued by the Kuṣāṇa rulers.

Kuṣāṇa Coins

The Kuṣāṇa era (1st to 3rd century A.D.) is very important for the numismatic study. Hiung-nu tribe displaced Yueh-chi tribe from the Chinese territory in the second half of the 1st century B.C. After migration and settlement in Bactria, the Kuei-shuang branch of the Yueh-chi tribe displaced Śakas and captured their territory. This Kuei-shuang later on came to be known as Kuṣāṇa, gradually built a great empire in India.

Important rulers of the Kuṣāṇa dynasty were Kujula Kadphises, Vima Kadphises, Kaniṣka, Huviṣka, Vāsiṣka, Vāsudeva-I and Vāsudeva-II, who issued beautiful gold coins of different variety. The source of gold was through flourishing trade from Rome, melting of Roman gold coins and Indian gold mines. The silver was imported from Afghanistan. The Greek script was gradually given up and *Ārya* script (*Tukhār*) was adopted during Kaniṣka's reign. Before that, the coins are found to be bilingual, having Greek inscription on the obverse and Kharoṣṭī on reverse.

On the Kuṣāṇa coins, the divine effect of the king is indicated by his bust surrounded with clouds, fire flames from shoulders, head inside the frame and halo around the head. The king is generally bearded. Vima Kadphises introduced extensive gold coins for the first time in India. These were issued in three denominations, viz., double-*dināra*, *dināra* and quarter-*dināra*.

The obverse of the Kuṣāṇa coins depicts the king in various attitudes—seated on a couch; seated cross-legged; seated at a window; riding on elephant; sitting in a *bagghī*; standing and sacrificing at an altar with right hand and holding a spear in left hand; holding a club in the right hand and a goad or spear in the left hand that rests on the shoulder; reclining on a couch; seated on a cushion with a club in right hand; holding a trident in the left hand and sacrificing at an altar by right hand; king in profile generally facing left and rarely facing right, etc.

Numerous deities are depicted on the reverse of Kuṣāṇa coins. About eight Roman/Greek deities, viz., *Ephaistos* (Fire God), *Erakalo* (Heracles), *Zeus*, *Oron* (Water God), *Helios* (Sun God), *Remo* (Rome God), *Salene* (Moon God), *Serāpo* (Serapi Goddess), etc. are identified. Similarly, about nineteen Iranian deities are depicted, like, *Ardokṣo*, *Athśo*, *Manāovāgo*, *Māo* (Moon God), *Miīro* [Sun God (*Mihir*)], *Ūromozdo*, *Nanā* (Lunar Goddess), *Nanā-śāo*, etc. About twelve Indian deities are also identified, as *Buddo* (Buddha), *Ameto Buddo*, *Maitreyo Buddo*, *Mahāsena*, *Skandokumāra Viśākho*, *Skandakumāra Mahāsena Viśākho*, *Oeśo* (*Śiva*), *Oeśo-Ommo* (*Śiva-Ūmā*), *Oeśo Nanā* (*Śiva-Nanā*), *Bāzodevo* (*Vāsudeva*), etc. One of the coins of Vāsudeva illustrates four-armed *Kṛṣṇa* and this has lot of cultural bearing. Symbols found on the coins are *svastika*, *nandipada* (several types), dots, etc. A deep study of coins unfolds the fact that the invading alien Kuṣāṇas gradually adopted and became a part of the Indian culture.

Coins of Western *Kṣatrapa* Dynasties

The Kuṣāṇa emperors ruled in the far-flung areas through their viceroys who were known as *kṣatrapas* or *mahākṣatrapas*. Subsequently, some of them declared themselves as independent and adopted the title of *Rājā* (king). This picture particularly emerged from western India and Deccan. The coins of such viceroys or independent rulers are mostly in silver or copper, and these disclose the existence of two prominent western *kṣatrapa* dynasties, viz., Kṣaharāta and Kārddamaka.

Bhūmaka was the first ruler of Kṣaharāta dynasty whose only copper coins are known. The obverse depicts an arrow, a disc or a *vajra* (thunderbolt), while the reverse show lion-capital and *cakra* (wheel). The legends are in Brāhmī and Kharoṣṭī. The obverse device of Bhūmaka's coins was used by Nahapāna, his successor, as the reverse device for his silver coins. About 13,250 coins of Nahapāna were recovered from the Jogalthambi (Nasik) hoard, where few are copper and rest silver. *Gautamīputra* Śātakarṇī (a Sātavāhana king) re-used about 9,000 of these silver coins.

The other western *kṣatrapa* dynasty Kārddamaka issued silver and few copper coins. Important rulers of this dynasty were Caṣṭana, Jayadāmana, Jivadāmana, Rudradāmana and Rudrasīmha. Notable feature of their silver coins is that most of them have not only given their own name and title, but also the name and title of their predecessor. Hence, we find both *mahākṣatrapa* and *kṣatrapa* titles in Brāhmī on their coins. The year of issue (Śaka year) is also given on the coins. The obverse generally depict the bust of king, while the reverse depict various figures, like, horse, bull, elephant, *caitya*, hill, crescent, star, wavy line, etc.

Sātavāhana Coins

A powerful dynasty emerged in Āndhra under the name of Sātavāhana, after destroying the remains of the Śuṅgas and Kāṅvāyanas in about 30 B.C. Simuk (30-37 B.C.) was the first ruler of this dynasty, followed by Kāṅhā or Kṛṣṇa (7 B.C.-11 A.D.) and Śātakarṇī (11-29 A.D.). After this, we come across a dark age of about hundred years when no coins of this dynasty are recovered. Then again we find that *Gautamīputra* Śātakarṇī revived the Sātavāhana dynasty in about 119 A.D.

The rulers of Sātavāhana dynasty issued coins in silver, copper, lead and potin (mixture of copper, zinc, lead and tin). The coins were prepared with punching, casting and die-striking techniques. They are mostly round, several square and rectangular, while very few oval in shape. Their weight varies a lot, from 2.9 to 9.25 grains.

The legends on Sātavāhana coins are in Brāhmī script and Prākṛt language. Some of the rulers used the name of their mother also on their coins, and particular mention can be made of *Vāsiṣṭhiputra* and *Gautamīputra*. The obverse generally depict the bust of king, while the reverse contain a large variety of symbols, like, *Ujjain*, *caitya*/hill, human figure, *mahāyajñeya* animals (bull, elephant, lion and horse), *śaṅkha*, *padma*, *cakra*, *śrīvatsa*, *triratna*, *Lakṣmī*, wavy water and fish, *svastika*, *indrayaṣṭī*, etc. The Sātavāhana coins are mainly found from the hoards of Tarhala (1600 coins); Chānda (183 coins); Jogalthambi (13,250 coins 9,270 of which were re-struck by *Gautamīputra* Śātakarṇī); Vategaon (684 coins); Hyderabad (200 coins); Bidar (1000 coins) and Brahmapuri (2400 coins).

Gold Coins of Golden Age

India witnessed an era of cultural resurgence when disruption and chaos came to an

end, political power was consolidated and the country progressed towards peace and prosperity. This cultural revival took place in the early 4th century A.D. under the mighty Gupta kings whose reign of about 200 years is termed as the Golden Age of Indian history. This fact is amply corroborated by the coins of this era.

Gupta gold coins are known for their rich variety and no dynasty has issued such a large number of currencies in different forms in the world. These coins are suggestive of a harmony between spiritualism and prosperity, which is the hallmark of Gupta period art. Beside gold coins, some silver and copper coins were also issued for the western region of their empire. The highly developed technique of preparing these coins in metal moulds was probably invented during this period in India. A remarkable factor about the Gupta coins is that the legends on them are often found to be poetic. The language used is chaste Sanskrit and the script is Brāhmī. Prominent rulers of this dynasty were Chandragupta-I, Samudragupta, Chandragupta-II, Kumāragupta-I, Skandagupta, Budhagupta, Kumāragupta-II, and several others.

The first two kings, namely, Chandragupta-I and Samudragupta are shown in the stitched drapery, which seems to be the impact from Kuṣāṇa coins. But from the time of Samudragupta himself, the Indianization became predominant. The obverse generally depicts the issuing king in various moods and postures, while the reverse is dedicated to some or the other deity. The early Gupta coins depict the standing king at an altar, very similar to Kuṣāṇa coins, but later on the Kuṣāṇa trouser is replaced by the Indian *dhotī*. Similarly, the trident held by the Kuṣāṇa rulers in left hand, is gradually replaced by *garuḍadhvaja*, the royal insignia of the Gupta dynasty. On the reverse, goddess *Ardokṣo* of Kuṣāṇa coins, gradually transforms into *Lakṣmī*, first seated on a throne (like *Ardokṣo*) and then on a lotus.

The most common Gupta coins are those, which show the king holding bow and arrow, facing left or right and wearing a dress or bare-bodied. This type was issued by almost all the rulers of this dynasty in a number of varieties, sub-varieties and variations. Other notable depictions are the king holding *garuḍadhvaja*, spear, sword, battle-axe, etc.; king seated cross-legged on a couch playing *vīṇā*; king killing wild animals like tiger, lion or rhinoceros with bow and arrow or sword; king riding on horse or elephant; king with a dwarf holding parasol, and several other types. Chandragupta-I, Kumāragupta-I and Skandagupta also issued *king-queen* type of coins. Chandragupta-I has even given the name of his queen as Kumāra Devī.

The reverse of Gupta coins depicts different deities either standing or sitting. Beside *Lakṣmī*, *Durgā* and *Gaṅgā* are also identified. Kumāragupta-I was known for his aesthetic zeal and this is witnessed by the depiction of *Kārttikeya* in different forms, particularly, majestically seated on a dancing peacock. The Gupta coins are recovered from numerous hoards obtained from various sites in Bengal, Orissa, Bihar, Uttar Pradesh, Rajasthan, Punjab and Haryana.

Metallurgy of Indian Coins

A careful scientific study of metals used in manufacturing the coins does give us a good idea of various aspects of the issuing authority or dynasty. For example, we know from various sources about the flourishing trade between India and Rome in ancient times. The same is reflected in Indo-Greek coins where we find 95-98% purity in gold coins. Other than gold, the Indo-Greeks have also used silver; cupro-nickel alloy (where copper content is

70-80% and nickel is 20-30%) in which the coins became white in colour; lead (used rarely) and electrum (a natural alloy where gold is 60-70% and the rest is silver).

During the Kuṣāṇa period, we find that there was a shortage of silver. Scarcely found silver coins of this era have lead mixed in them. Copper was used extensively. Kuṣāṇas manufactured gold coins with about 98% purity. The main sources of gold were Altai Mountains in central Asia, river sands of Indus and through trade. Sātavāhanas should be given the credit of introducing a large number of lead currency for the common people. They discovered that silver and copper melted at about 1000^o C, while the melting point of lead is only about 300^o C, thus, easy stamping is possible. Lead during this period was imported from Spain and through Roman trade.

Guptas issued plenty of gold coins, less of silver coins and the least of copper coins. Extensive use of gold during this period might be due to the discovery of Kolar Mines. The technology was so advanced that Guptas went almost 500 feet deep in the mines to get good quality of gold, which is clearly visible in their superior quality of gold coins. Other sources of obtaining gold were from south-east Asia, China and eastern empire of Rome. Viṣṇukunḍin coins (7th century A.D.) have iron mixed in them because of which they acquired magnetic properties. Thus, scientific studies of coins add new dimensions to the reconstruction of history.

Based on the lectures delivered by Prof. K. K. Thaplyal, Prof. T. P. Verma and Prof. H. C. Bharadwaj in the Special Study Course on Early Indian Coins conducted by Jñāna-Pravāha in February 2002.

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