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PLANT ECOLOGY AND THE LAW OF THE RELATIONSHIP BETWEEN ACTION AND RESULT

It is good to introduce the topic with a reference to Newton's famous third law of motion, according to which for every action there is an equal and opposite reaction.¹ But the special point of view presented in this paper, is the link between that Law, translated into the moral realm, and its associated concept of rebirth with plant ecology.

As every one knows, the Hindus believe in the cycle of births and rebirths affecting human beings as well as other beings. Śri Kṛṣṇa, in his famous exposition of the law of this cycle, explains it to Arjuna, with some reference to the latter's own personal case (*The Bhagavadgītā IV. 4*). According to it, a person obtains the result of the actions done in one birth in the next, if he does not obtain it in that very birth itself. This, no doubt, sounds very much like Newton's third law, enunciated in terms of physics. In the moral realm also, one's actions do not just disappear without their results having been reaped. Manu, the first law-giver in the Hindu tradition, declares that actions that spring from a living being's mind, speech and body, determines the consequent condition of that being, i.e., whether of the highest (*uttama*), middling (*madhyama*) or the lowest (*adhama*).²

Actions springing from the mind, speech and body are divided into ten classes. Thus, the actions pertaining to the mind are of three classes, those pertaining to speech are four, and those pertaining to the body are three.³ Coveting the property of others (*paradravyaṣva-abhidhāna*), thinking in one's heart what is undesirable (*manasā aniṣṭacintā*) and adherence to false doctrines (*vitatābhiniveśa*) are the three kinds of sinful mental actions (*mānasa karman*).⁴ Speaking hard words (*pāruṣya*)

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1. *Ency. Brit.* Vol. XIII P. 16-20.
 2. *Manu Smṛiti* (M.S.) XII. 3.
 3. *ibid* XII. 4.
 4. *ibid* XII. 5.

to others, making untrue statements (*anṛta*), detracting from the merits of any man and talking irrelevant things, or prattle, (*asaribandha pralāpa*) are the four kinds of wrong verbal action (*vācika karman*).⁵ Taking what has not been given (*adattānam upādānam*), injuring creatures without sanction of the law (*himsā caiva abhidhānataḥ*) and adultery (*paradāropaseva*) are the three kinds of sinful bodily actions.⁶

Due to these ten kinds of sinful actions performed with mind, speech and body, a person obtains different conditions in the next birth. It is also construed that if a person commits many sinful acts with the body the result will be rebirth as plant, tree, shrub and such like. If a person commits many sinful acts with speech he will be reborn as bird or beast, and in consequence of similar acts with the mind the next birth will be into a lower status. All these consequences result from persistent sinful acts of the bodily, verbal or mental kind.⁷ And moreover all the traits of those sinful deeds will stick to the person's new body. In the context of the topic of this paper the sins committed through physical action shall be the special focus.

When a person takes away what belongs to another without obtaining permission, that is known as *adattānam upādānam*. In the case of a gift there are to be four elements, i.e., the person who gives (*dātṛ*), the person who receives (*pratigrahītṛ*), the article to be given (*deya*) and the transaction of giving (*vyāpāra*). Where these elements exist in a correct state, the property of the giver is transferred to the receiver. At the same time, the receiver obtains the right to utilize the property duly received, of his own accord. It is observed that by virtue of this the giver has no longer any proprietary right over the property given. Normally, the presence of both the giver and the receiver is unconditional. But in some unusual cases the receiver does not appear at the time of the transaction. However, the giver gives. But this is not gift (*dāna*) in the full sense. Hence it is described as a species of dedication (*utsarga*). The intention of the giver is, no doubt, fulfilled but inasmuch as the receiver has not actually received the gift his responsibility (as distinguished from right) has not ceased: he has to protect the property still, i.e., until the receiver actually receives it. In the meantime, however, although the property has not really changed hands, inasmuch as the receiver has not received

5. *ibid* XII. 6.

6. *ibid* XII. 7.

7. *ibid* XII. 9.

it, the giver may not use the property for his own purposes as he has already in the legal sense parted with it. If he still retains it or repossesses it for his own use he would be committing the evil deed of *adattānam upādānam*, mentioned in this technical sense by the *Dharmaśāstras*. By doing such a wrong deed the perpetrator of it, though a giver, has to bear the life assigned to a plant or shrub, in a condition of immobility (*sthāvara*) akin to the mountain. This condition distinguishes the essence of the plant-body (or shrub-body or tree-body). [The figurative description and symbolic intent of these are quite unmistakable].

All the activities of a person's past *karman* are reflected in the bodies of plants/trees/shrubs. This is interpreted in the way it is done here in order to show the connection between the fruit of the tree and the fruit of actions—the tree gives fruits even when there are no creatures to enjoy them. [In other words, the fruits of the tree are self-referent to the tree itself]. A person has to develop all these qualities with reference to this [fact]. He has to discharge some responsibilities which connect him with the *saṁskāra* produced by past undertakings as well as with future commitments with birth to follow. Therefore, he gets the plant life, in which he has to offer his flowers and fruits without being asked. This is nothing but the symbol of the past evil deeds or sins that he had committed, which law is what is called *adattānam upādānam*.

Now about killing (*himsā*). It is not sanctioned by the law. But wherever a significant benefit is to be obtained for society by killing one is entitled, under such circumstances, to kill. That is why it is said that *ātmārthe pṛthivīm tyajet*. On other occasions killing is strictly prohibited by the dictum *na himsyāt sarvā bhūtāni*. If a man involves himself in injuring the creatures without the sanction of law such kind of sinful act of that man shall be termed as *himsā caivābhi-dhānataḥ*. By dint of such sinful act of the body he inherits the body of the plants or trees in the next birth. All those qualities of sinful acts like cutting, striking etc., which are connected with his body are to be reflected upon the body of the doer in the next birth. This case happens in the field of plants and trees. The plants tolerate the injury incurred by cutting their branches, plucking of fruits and flowers and striking of stones etc. at its fruits. People utilize the barks of the trees for various purposes. In preparing medicines the barks of the neem tree and *Arjuna* etc. are essential. In making manuscripts the bark of *bhūrja* is utilized. The sacrificial

sticks *samidh*-s are collected from trees like *udumbara*, *āmra* and *palāśa*. Not only man but animals also live by branches, leaves and flowers of the tree. These occurrences symbolically represent the theme of tolerance of the plant-kingdom incurred by the creatures.

Another sinful act of the body is the *paradāropasevā*. When the act of a man involves criminal intercourse with another man's wife, such wicked bodily action is termed *paradāropaseva*. In performing such act with his body the man also is reborn as plant or tree or shrubs. And by such acts he is involved in the development of the plant community in the process of breeding. Hence it is known that the man, having committed three kinds of sinful acts, is reborn in the form of plants and trees. Those qualities of the bodily actions are reflected in the plant life in the form of actions associated with fruits such as cutting, breeding, tolerating and developing. This is what is known about the development of the entire plant kingdom from the bodily actions of the human being. Thus action-result relationship is maintained all the way through. Under this type of relationship man is deeply related to the plant ecology. Relation is not some random incidence or coincidence. It presupposes the ecological connection between action and result. Therefore, ecologically the relation is carried over to the relation between man and plant. The law-givers of Hindus were very aware of this law.

Manu says that of created beings the most excellent are said to be those which have the animal essence, and of which have the animal essence the best are those which subsist by intelligence, and of the latter the best are human beings.¹⁰ But man is brought up in the lap of nature, and his entire life is determined by nature. Nature participates in the adversities as well as corruptions of his life. So man comes to love his natural surroundings deeply and with his intelligence he exploits nature for his manifold uses. For his food he depends upon plants. The carbohydrates synthesized by the plants are the main sources of his energy. Besides this, man sustains his life eating fruits and roots of the tree. He covers his body by the bark of the trees and also prepares his clothing from plant fibres. He constructs his dwelling with the timbers, bamboos

8. *Svasvatvadhvaṁsapūrvakaparasvatvāpādanaṁ dānam.*

9. *Utsārga* has the status of *dāna* but it is not a full *dāna*. It is *parokṣa dāna*, the indirect mode of dedication. For details see my *Introduction to Śraddhāpradīpa* (Puri, 1982).

10. *Manu Smṛti*, I. 96.

and leaves of the plants in order to protect himself from the extreme conditions of nature such as heat, wind, rain and cold. Many life-giving plants are also used as medicines by man since the Vedic age. Man uses some parts of the plants and their extracts directly as medicine for curing diseases. For instance, quinine, which was once upon a time an indispensable drug for curing malarial fever, is prepared from the bark of cinchona plants. Thus man being born on the lap of nature utilizes its natural resources such as trees and herbs in number of ways.

When man became more civilised, he started realising the importance of the study of the effect of environment on the life and forms of plants. He began to study the relationship between organisms and their environment which gave birth to a new branch of science called ecology. In ancient India, though ecology did not exist as a separate branch of science, one cannot completely deny that the botanists of ancient India had knowledge of it. The botanists had felt the influence of the plant kingdom on human life. Therefore, we get ample information of what we now call plant ecology from the Dharmashastras such as *Manu Smṛti*, *Yājñavalkya Smṛti*, *Gautamadharmasūtra*, *Visnudharmasūtra* etc. We find some botanical references in *Manu Smṛti* etc., which contain systematic scientific knowledge of the plant kingdom. There is also found information on plant communities under the head of *auśadhi*, *vanaspati* and *vṛkṣa*.

According to Manu, the plants which wither away after fructification are known as *auśadhi*. Those trees which bear fruits without flowers are called *vanaspati*. But those which bear both flowers and fruits are designated as *vṛkṣa*.¹¹ Among these species, some plants grow from seed from slivers or from shoots.¹² In addition to this, Manu also mentions the plants with many stalks growing from several roots, the different species of grasses, climbing plants and creepers.¹³ Moreover, the use of the term *kāṇḍaruh-eva* makes it clear that the people of India in the hoary past were quite aware of the various methods of plant culture. Another astounding insight into the concept of life in plants. Manu has studied the plants from a philosophical stand-point, and finally concluded that there is no difference between plant life and human life. Therefore, he contemplated the rebirths of plants too. Thus he maintained that as human

beings experience pleasure and pain due to their past deeds (*karman*), so also the plants suffer and experience pleasure due to their past *karman*. Hence, these plants which are surrounded by multiform darkness, the result of their acts (in former existence) possess internal consciousness and experience pleasure and pain.¹⁴

Apart from this, Manu also mentions the punishment for the destruction of the plants either by people or cattle. For instance, for cutting fruit-trees, shrubs, creepers, lianas or flowering plants, one has to undergo some sort of expiation and recite one hundred *Rks*.¹⁵ If a man destroys plants produced by cultivation or such as spontaneously spring up in the forest not to serve man's purpose he shall attend on a cow for one day, subsisting on milk alone.¹⁶ Fine was collected from persons for stealing plants and their extracts. A man who steals flower green corn, shrubs, creepers, trees and unhusked grain was fined five *kriṣṇala-s*.¹⁷ For stealing husked grain, vegetables, roots and fruit, the fine shall be one hundred *paṇa-s*. If there is no connection between the owner and the thief, fifty *paṇa-s* are to be given.¹⁸ Fasting during three days and nights shall be the penance for stealing grass, wood, trees, dry foods etc.¹⁹

Relating to the destruction of plant and trees by the cattle and other domestic animals, Manu promulgates the rules thus: sufficient care should be taken by the land-owner to protect his corn-fields and gardens etc. He has to make there a hedge over which a camel cannot peep, and close every gap through which a dog or a boar can thrust its head.²⁰ If cattle do mischief in an enclosed field the herd owner shall be fined one hundred *paṇa-s*; but cattle unattended by a herdsman, the watchman shall drive away.²¹ In this way the punishment was imposed on those who destroy plants, in proportion to the usefulness of the plants for society.²²

Besides this, Manu enjoins the growing of plants and trees for marking boundaries on the disputed lands. He stipulates that one should

14. *ibid* I. 48.
15. *ibid* XI. 142.
16. *ibid* XI. 144.
17. *ibid* VIII. 330.
18. *ibid* VIII. 332.
19. *ibid* XI. 166.
20. *ibid* VIII. 239.
21. *ibid* VIII. 238, 285.
22. *ibid* VIII. 246.

erect boundaries by *nyagrodha*, *aśvattha*, *kiṃśuka*, cotten trees, *śāla-s*, palmyras and trees with milky sap and clustering shrubs, bamboos of different kinds, *sami-s*, creepers and raised mounds, reeds and thickets of *kubjaka*;²³ as a result of which the boundary can be easily marked. This is what we know from *Manusmṛti* in respect of plant-ecology.

Yājñavalkya follows the principles of Manu in letter and spirit: but in the context of protection and preservation of plants he gives his own views. According to him, one should not cut the plants without a purpose. If some one so cuts a plant, a bush, a creeper or a tree he has to recite the *gāyatrīṅk* a hundred times, and for ruthless cutting of useful medicinal herbs one should live on milk and should follow a cow for a day.²⁴ Besides this, Yājñavalkya gives serious attention to the destruction of the plants, trees and crops by domestic animals such as buffalo, goat and cow. Therefore he says that a pasture should be set apart for the kine according to the desire of the villagers and with permission of the king.²⁵ A distance of hundred *dhanus* (equal to four cubits) should be set apart on all sides between village and fields, that of two hundred between a village with profuse growth of thorns and fields, and of four hundred *dhanus* between a city and fields, for the free grazing of the cattle.²⁶

The herdsmen are permitted to allow their cattle to graze freely in these pastures only; otherwise the owner of the cattle is to be fined if it destroys other's crops. For instance, if a buffalo destroys another's corn, its owner must be fined eight *masā*, if a cow, with half of it (i.e. four *masās*), and if the destruction is caused either by a goat or lamb with half of the half i.e. two *masās*.²⁷ If animals stay in the field after eating the crops the herdsmen are to be punished with twice the amount of the fine. The same amount of fine is to be levied if a plot of land covered with grass etc. is destroyed. The penalty if the animal is an ass, a camel or a she-buffalo is identical.²⁸ If the keeper or owner of cattle allows them to graze unintentionally on fields situated at the out-skirts

23. *ibid* VIII. 285.

24. *Yājñavalkya Smṛti* (Y.S.) III. 278.

25. *ibid* III. 166.

26. *ibid* III. 167.

27. *ibid* III. 159.

28. *ibid* III. 160.

of a high way or a village or a plot of land covered with grass, he commits no offence; but if he does it intentionally he has to be punished like a thief.²⁹ The terms like *ārāma* used by Yājñavalkya in the context of boundary-dispute show that even the people of hoary antiquity in India were conscious of the preservation of valuable fruit-producing trees and plants by constructing beautiful gardens. This is what is known from the principles of Yājñavalkya regarding the protection and preservation of plant-ecology.

Āpastamba treats the leaves and flowers of the trees and herbs as the most sacred creation in the Universe. That is why he strictly prohibits the cutting (*āchidya*) of leaves and the plucking of flowers of the trees in order to smell (*nopajighreta*) them.³⁰ Another remarkable contribution of Āpastamba is the control of environmental pollution. Being conscious of the pollution of the environment, he declares in his aphorism that one should not answer the calls of nature (*mūtrapuriṣayoḥ karma*) in the shade of a tree.³¹ While passing on the road one should not clean oneself by breaking twigs and herbs.³² People must have cleaned themselves that-way and then thrown things like leaves used for it on the way. This was expressly forbidden. That habit must have been a main source of environmental pollution. The reference also shows that there was in those ancient days a high degree of awareness of the ill effects of such habits as well as express-efforts to stop them.

Baudhāyana has classified the term *auśadhi* into two heads. They are, namely, *valliauśadhi* and *ṛṇauśadhi*. By *valliauśadhi* he means the extracts of the leaves such as of *kulatha*. And *vṛhi* and such others are examples of *ṛṇauśadhi*.³³ It is known that Manu has defined the term *auśadhi* simply. But baudhāyana proceeds a little further and classifies the term *auśadhi* into *valliauśadhi* and *ṛṇauśadhi*. This reference gives an idea of the development of botanical science. Apart from this he also mentions the modes of subsistence of human beings. The ways to earn livelihood are many. They are such as *kauddālavṛtti*, *samūhavṛtti* and *vānyavṛtti* etc. while defining *kauddālavṛtti* he pays stress upon the cultivation of land and he uses various articles there such as *kuddāla*,

29. *ibid* III. 161.

30. *Āpastambadharmasūtra* (Ap. D.S.) I. 2. 7. 4.

31. *ibid* I. 11. 30. 16.

32. *ibid* I. 11. 30. 24.

33. *Baudhāyanadharmasūtra* (B.D.S.) III. 2. 15.

phāla and *tikṣṇakāṣṭha* as the instruments of the cultivation. And people dug the earth near streams or tanks with spade, plough-share or some pointed piece of wood, and sowed seed and grew bulbs, roots, fruits, pot herbs and vegetables.³⁴ All these relate to subsistence forming.

As to the mode of subsistence called *samūha*, if a person sweeps up grain from plants with a broom in permitted places where grain bearing plants are found either on a road or in a field, the access to which is not obstructed by hedges and he lives on what he has thus obtained, that livelihood is called *samūha*.³⁵ If he subsists on the produce of the forest i.e. the fruits of the trees, creepers and lianas and of grasses such as wild-millet (*śyāmāka*) and wild sesame, that mode of life is called forest life.³⁶ This mode of livelihood is mainly adopted by the hermits who regularly reside in the forest, ever contented and delighted with garments made of bark and skins and go far to fetch water in pots.³⁷ Further, it is stated that the trees loaded with fruits and flowers are always sacred, whether they grow in an unclean place or a clean place. The difference does not matter.³⁸ In a nutshell we can say that Baudhāyana was quite aware of the botanical science. His classification of *auśadhi* plants into *valliauśadhi* and *tṛṇauśadhi*, his reference to plants for people to earn livelihood with and to different articles to cultivate the land to grow show also his keen awareness of plant-ecology.

We find reference to the protection of plant community and to the prevention of environmental pollution in the work of Gautama i.e. the *Gautamadharmasūtra*. Gautama has also mentioned the system of tax collection from the cultivators and the amount of fines which is collected from the persons involved in damaging other's corn-fields. In the context of pollution of the environment, Gautama refers to several factors that directly cause such pollution. According to him, people answer the calls of nature under the sacred shade of trees, and then throw the leaves used for cleaning, which pollute the environment. Also, people do these sometimes on the road-side or in the ploughed land which creates pollution of the air. Therefore, Gautama enunciates the principle that one should not

34. *ibid* III. 2. 3.

35. *ibid* III. 2. 9.

36. *ibid* III. 2. 14.

37. *ibid* III. 3. 19.

38. *ibid*.

do these things.³⁹ Cool shades of trees and beautiful spots are to be especially protected⁴⁰. While discussing the ways to protect the plants, first he lays stress upon the proper fencing of the field.⁴¹ If the cultivators do not enclose their lands-property then neither the administration nor the herdsmen would be held responsible in case the corn-field is damaged. In those cases the entire responsibility falls upon the herdsman and the owner of the field. If fruits, green corn and vegetables are appropriated in small amounts the fine is five *kṛṣṇala*-s (of copper).⁴² If the damage is caused by the cow five *masā*-s are to be collected as fine,⁴³ six for a camel or a donkey, ten for a horse or a buffalo and two for each goat or sheep. If the whole crop is destroyed, the value of it must be paid and a fine in addition. But collecting grass for cow, wood for fire, flowers and fruits of the creepers and trees in an unenclosed field are allowed.⁴⁴ One should not remove parts of plants or trees except such has have been detached spontaneously.⁴⁵

While explaining the importance of growing plants, the fifth century law-giver, Viṣṇu, says that one who plants trees will have those trees in the form of their sons in their future existence.⁴⁶ It becomes quite obvious that Viṣṇu finds no difference between plant life and human life; According to the birth-cycle the human body is determined by a person's past *karman* as is also the case with plants. As for a man the life of his son is most valuable, so also should be the life of a plant; one should treat the plant as his son. Therefore, from the point of view of Viṣṇu, growing plants is a meritorious deed. Not only man gets the rewards for growing plants while he is alive but he enjoys its results in his future existence also. One gladdens the gods by offering blossoms of the trees and plants to them. One gladdens his guest by giving their fruits to them as travellers are gladdened by the shade of trees.⁴⁷

39. *Gautamadharmasūtra* (G.D.S.) I. 9. 15.

40. *Ibid* I. 9. 41.

41. *Ibid* II. 3. 18.

42. *Ibid* II. 3. 15.

43. *Ibid* II. 3. 19.

44. *Ibid* II. 3. 25.

45. *Ibid* II. 3. 19.

46. *Viṣṇu dharmasūtra* (V.D.S.) 89. 4.

47. *Ibid*. 92. 22.

With reference to the action-result relation theory it is learnt that people involved in stealing plants would merit different births in future. For instance, one who encroaches upon a broad passage becomes a serpent or other animals living in the holes.⁴⁸ One who steals the juice of sugar-cane becomes a dog. By stealing water one becomes water-fowl. In this way the Hindus calculate their future life on the basis of their present deed by an assessment of the degree of its values. Under this theory the plant-ecology acquires a definite shape of continuity in human community.

48. *ibid* 44. 13.