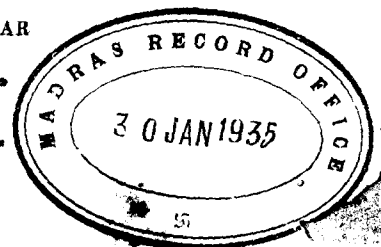


The
Madras Journal of Literature
and Science

FOR THE YEAR

1879.



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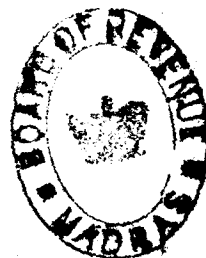
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THE
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AND SCIENCE.

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ON HYGIENE IN ANCIENT INDIA.

AN inquiry having reference to *Hygiene* in ancient India is at the present time of considerable interest. Such an investigation, however, is attended by not a little difficulty, and, in the absence of other particulars regarding it, must be prosecuted rather in the pages of historians and poets than in those of regular medical treatises. In the following remarks I accordingly desire to collect such observations bearing upon the subject as have come under my notice,* they being arranged for the sake of greater convenience into those that bear upon General Hygiene and those that more properly belong to Army Hygiene.

* The following are the works to which I am chiefly indebted for information, namely:—1, Ancient India as described by Megasthenes and Arrian, by J. W. McCrindle, A.M.; 2, History of India, by J. Talboys Wheeler;

The Indian Antiquary; 4, Hindu System of Medicine, by T. A. Wise, M.D.; 5, Ancient and Mediaeval India, by Mrs. Manning; 6, Calcutta Review, No. 83 of 1865; 7, Asiatic Researches; 8, Colebrook's Essays; 9, Professor Wilson's Works; 10, Travels of Buddhist Pilgrims, S. Beale; 11, Legend of the Burmese Buddha, Bishop Bigandet.

NOTE.—This paper does not pretend to contain more than an imperfect sketch of the subject of which it treats; it may, however, form a groundwork for further investigations regarding the different points alluded to in it.

I. GENERAL HYGIENE.

1. *Historical Allusions to Hygiene*.—That the preservation of public health—in other words *Hygiene*—was in the very earliest periods of India's history considered in relation to general polity is apparent from the frequent allusion contained in "The Institutes of Manu;" nor is the circumstance less evident from the tenor of those institutes, that the state of society to which they refer was in many respects advanced and refined. Here, for example, is an enumeration of subjects touched upon by that great law-giver, namely, 1, On the Creation; 2, On Education, or on the "First Order;" 3, On Marriage, or on the "Second Order;" 4, On Economies and Private Morals; 5, On Diet, Purification, and Women; 6, On Devotion, or on the "Third and Fourth Orders;" 7, On Government and on the Military Classes; 8, On Judicature and on Law, Private and Criminal; 9, On the Commercial and Servile Classes; 10, On the Mixed Classes and on Times of Distress; 11, On Penance and Expiation; 12, On Transmigration and Final Beatitude. The Ayur Veda, propounding the science of health, contains various allusions to subjects more properly within the province of Preventive Medicine—*Pathyāpathya*, that is *Hygiene*, including the care and diet suitable for children,—the universal *panacea* that would render health permanent and perpetual, and prevent, as well as cure, diseases,—besides various distinct precepts for the preservation of health. Similarly, the Atreya includes preventive as well as curative medicine, although several of the subjects therein described under the first named category have long since ceased to be looked upon as within the province of hygiene.

In that ancient work there are chapters on the classification of diseases; the physical influence of soil and season; on age and temper, and on the influence of the winds—in other words on medical geography and climatology, the qualities

of different kinds of *water* as that of the Ganges "which comes from heaven," sea-water, rain-water and that from snow and ice; the qualities and medicinal properties of *milk*, as that of kine, goats, ewes, buffaloes, camels, and lastly of women; also remarks on butter-milk; on sugar-cane; on sour gruel; infusions of rice, barley, and other grains; oils, different kinds of grain; fruits; on the four kinds of spirituous liquors as made from molasses, honey, mead, and a plant (*Bassia*?) ; on the medical properties of different kinds of flesh, as of hoofed and horned animals, beasts of prey, birds, fishes, serpents, whether of the water or of arid districts; and on the *moral* causes of disease.

The exact dates of the Ayur Veda and Manu's Law Code are not known, but we may pretty safely fix them a few centuries before our era.

2. *General Condition of the People*.—Several particulars with regard to the general condition of the people of India during the Vedic period are to be gathered from the descriptions of early life contained in the story of the greatest Indian Epic, the Mahabharata. Then, as at the present day, the majority of the countrypeople lived in *huts*, for, as is still the case, the nature of the climate required the greatest simplicity with regard to accommodation, and also as to clothing; they smeared the mud-floors and walls with cow-dung by way of cleansing them; they sprinkled water upon the floor and passages before sweeping; they decorated their dwellings with flowers, and, in times of rejoicing, assembled under canopies made gay with streamers and decorated with flowers. As population increased new settlements were formed, the jungle being for this purpose cleared by means of fire and axe, and huts or villages erected in the newly-opened-up space. Their sacrifices to their gods consisted of the choicest articles of their food, including flesh-meat and simple cakes, parched grain, ghee or clarified

butter, curds, and the *Soma wine* or *Indra's drink*, a wine or rather spirit prepared from the fermented acid juice of an *Asclepias*, namely, the *Asclepias acida*, *Sarcostemma viminalis*, or *Cynanchum viminalis*. This drink was indulged in to great excess on occasions of Bacchanalian festivals, dating, it is said, from about B.C. 1400. Upon this beverage the Pandavas are described as indulging to an extent that was abominable, having at the same time promiscuous intercourse without regard to relationship, eating flesh extensively, and, in this drunken and debauched condition, dancing together in a medley.

Among them the art of cookery was held in high esteem; the office of cook was a position of honor and trust; thus Bhima was appointed by Rajah Virata head cook as a mark of distinction. There were regular *washermen* as a separate class, and particular allusion to them occurs in the time of Krishna. As to arrangements of *conserancy* in establishments, so far as can now be gathered, the fields and forests served all such purposes. That the value of pure water was fully appreciated appears from the circumstance that among the most esteemed works of charity was the excavation of wells; another the erection of rest-houses for travellers. Among the most expressive marks of hospitality was the bringing of water to wash the feet of the dusty way-farer. It is satisfactory to learn also that in those times long gone by the *duration of human life* was estimated as one hundred years; nor have we much improved on that standard during the three thousand years more or less that have elapsed in the interval. The circumstance of a person being attacked by *disease* was looked upon as so far a disgrace that illness was inflicted by the gods as a punishment for sin committed. Hence Brahmins who feared its approach would burn themselves alive rather than undergo its sufferings; others, more submissive held festivals on making a recovery.

Of the early Aryan invaders it is said that they were much given to indulgence in wine, women, animal food, and high play; in all of which respects their habits were not so very dissimilar after all from some of the more modern occupants of India. Horse-flesh was by them largely consumed, it having been looked upon as having stimulant qualities. Rama and Sita, while wandering together in the jungle, are said to have lived chiefly upon venison dried in the sun, as is the custom at the present day with the American Indians. Animals were sacrificed to the gods, their flesh then eaten; instead of these animals, after a time oblations of rice and milk were offered as sacred food, and as Brahminism became established vegetable food was substituted for animal. Indulgence in wine continued to be a prevalent vice; in other words the worship of Varuni (goddess of wine) was very general; sellers of intoxicating drinks, however, were looked upon as inferior, being classed among sellers of flesh, iron and poison. But although indulgence in strong drinks was thus general, the vice of drunkenness, like licentiousness, was deemed to be disgraceful. In aftertimes the Buddhist laws against drunkenness were held to extend also to the use of opium and other intoxicating drugs.

In Vedic times the warrior classes were polyandrous and polygamous according to circumstances, including no doubt convenience; the peaceful classes, however, observed monogamy. But in other instances, as in that of the Sakya, marriages took place between brothers and sisters, as indeed is done at the present time in Upper or Native Burmah. This union was, and is, however, regarded with the utmost detestation by the Brahminical law. Suttee had not then come into use; a widow was directed to devote herself to works of charity, and under Manu's law to marry the brother of her deceased husband, "or any other man." According to Manu, marriages were prohibited within the sixth degree

of relationship; also with a person who was subject to consumption, indigestion, epilepsy, leprosy or elephantiasis deformed, with one who had inflamed eyes, or who suffered from habitual sickness. In selecting a wife one should see that her form is without defect, that she walks gracefully "like a young elephant;" that she has a moderate quantity of hair, teeth of moderate size, and an exquisitely soft body. Certain classes of persons were excluded from *Shraddhas* or funeral feasts, doubtless for hygienic reasons, although their precise nature does not now appear. Among the persons thus excluded were those afflicted with physical evils, such as leprosy, blindness, and elephantiasis; those guilty of certain kinds of immorality; sellers of meat, wine; gamblers, *physicians*; the latter no doubt, because their profession then among uncleanness of many kinds.

A very vivid picture of the condition of the people in the Buddhist period occurs in the work of Hiouen-Tsai. There was then no registration of families for taxation, no requisition for gratuitous labor; all who were employed on the construction of royal buildings or other public works were paid according to their labor; cultivators occupied the heritages of their fathers and paid to the king as taxes one-sixth of their produce; transit duties on merchandise were paid at ferries and barriers; the punishment of death for crimes was not inflicted, banishment "to the desert mountains" having been its substitute. At the proper time the agriculturists permitted the streams to overflow the land, by which the soil was rendered soft and fertile; provisions of all kinds, cereals and fruits, were very abundant, and in the evening "the sound of convent bells might be heard on every side, filling the air with their melody."

Numerous allusions to what we may term "Sanitary" conditions during the Brahminic period occur in the *Ramayana*. That great epic poem opens with a description of the

ancient city *Ayodhya* represented by the modern Fyzabad, and it was but an example of many as they then existed throughout India. The houses are there described as large and beautifully arranged; the streets always watered; the gardens pleasant, full of birds and flowers, and with many groves of fruit trees; the tanks of the city magnificent beyond all description and covered with white lotus (*Nymphaea lotus* *alb.*); birds swam upon the surface, and a border of plantain *mem* surrounded each tank. Around the city were lofty *indu*ls, and outside them a moat filled with water, deep and *men*assable like that of Palibothra, no doubt a receptacle for city sewage. *Ayodhya* was full of people; every one healthy and happy; everybody was fed on rice, and, as *ord*ed, well-fed; children were numerous, and "no man *all* less than a thousand years," that is, no doubt, many *ined* a ripe old age. Men fixed their affection "upon *ar* wives only,"—a very proper state of society indeed; *omen* were chaste; no one was poor or fed on unclean things; in all *Ayodhya* there was not a man or woman who was unfortunate, or foolish, or wretched, or diseased. *Those* were surely the "good old times" of India, the *golden age* of society and of propriety. During the Vedic *period* regular roads did not exist; hence, on the occasion of the advance of an army or of a chief, communications of his kind had to be opened up for their passage. Even before the date of the *Ramayana*, however, large tracts of the country had been intersected by roads, along which pillars or milestones were erected to mark distances; inns for travellers had also been erected. A regular system of village communities existed,—their rights and privileges well defined, the affairs of each village conducted by officials appointed for the purpose. Among the works connected with each village, trees with creepers, chiefly *convolvuli*, were planted; lakes, wells, and streams were formed, partly for use by the people, partly

to serve as boundary-marks. The people paid their taxes in kind. As charitable works they constructed tanks, ghâts, and rest-houses for travellers, and feeding the poor and afflicted.

3. *Topography and Climate*.—Many allusions occur in the history of ancient Hindu medicine to the influence of locality and climate, as also the manners and customs of peoples, on disease, and to the consequent necessity on the part of any accomplished physician to study their influence on the spot—in other words, to travel. *Charaka* thus writes on the subject of climate and locality: "The moist country *Anupa* is intersected by rivers; the air is cool; lilies and other water-flowers abound; geese, ducks, cranes, fish, and serpents are numerous." In such a situation the inhabitants are unhealthy and short-lived; "the juices of the body require to be dried by the use of hot, dry, and light food in small quantities so as to strengthen the internal fire." Such a locality would be said to be swampy and malarious, the inhabitants affected with malarial cachexy.

The second kind of country described is the hilly or *Janagala*, characterised by arid plains on which dwarf trees and prickly shrubs grow sparsely; the heat of the air is great and hot winds prevail. In such a country there is little water upon the surface, and wells have to be dug. The diseases of "air and bile," that is intestinal and hepatic, are most frequent, but the climate is healthy and the inhabitants are long-lived. It is remarked that "when a person is born in a particular climate and has air, bile, and phlegm deranged, these affections will be aggravated if he go to a worse one; but, "if he journeys to another and better climate," the tendency to disease will be removed, showing clearly that the effect of *change of climate* was then understood and appreciated. It is further added that, when the above enumerated climates are found in the same country, the general climate of that country is described as *mixed*.

4. *Seasons*.—Numerous allusions occur to the influence of season on health and disease. Thus it is stated bile varies in different seasons: in July and August it is increased; in September and October it is liable to be diseased; in March and April it is diminished. Chyle is also said to be deranged by the seasons: in November and December it is increased; in March and April it is liable to be deranged; in May and June diminished. Six seasons were enumerated: *a. Cold months*, i.e., January and February; warm clothing was then to be used; broths of flesh and fish-meat and substances mixed with ghee (clarified butter) to be taken; in the wine called *Sidhu* to be used; also honey with water, wax, sweetmeats, fat, and new rice; warm water to be used; the head and body oiled; the person to sleep near the centre of the house removed from the wind. *b. Spring months*, March and April; bodily exercise; tepid water for every purpose; use barley and wheat, the flesh of deer, hares, wild fowls; drink *Sidhu* and *Mada* wine. *c. Hot months*, May and June; use cool foods and food prepared with ghee; drink herbs; use broths of wild animals and birds; eat rice with milk and ghee; little wine is to be used, and always mixed with much water; do not take much exercise; sleep during the day in a cool room and at night in the upper rooms, and the hand-punkah sprinkled with sandal wood and water. *d. The Rainy season*, July and August. Water is impure during this season; the use of river water is to be avoided, also exposure to the climate or to the sun, and too much exercise; the wine of grapes and fresh water that has been spoiled are to be drunk; anoint the body with fragrant oil; bathe daily; use light white clothes, and live in a dry and high house. *e. The Moist season*, September and October. The water is pure and may be used freely for bathing and drinking. The food produced during this season is not good, but is improved by keeping if it admits of this. Use purgatives

and blood-letting; avoid exposure to the sun, heat, and night air, more particularly the east wind; sleeping during the day is to be avoided, also fat, oil, fish, the flesh of amphibious animals and acids. The clothes should be light and clean, the mention of the latter being remarkable in as much as it is not elsewhere alluded to in this category. *f.* The *Cold season*, November and December. The water becomes clear, cool, and heavy; *bilious* diseases, common during the preceding two months, diminish; mists hang over tanks and rivers; diseases from "bile" are cured.

Irregularities of the seasons are alluded to as producing an unfavorable effect on health; food, water, and medicine lose their good effects, and various diseases are produced; plagues prevail. Easterly wind increases "phlegm" westerly wind increases internal heat, dries the body, diminishes bulk and strength; northerly wind is soft, cool and slightly sedative; southerly wind is pleasant and does not produce heat, and has also a light and sedative influence. Thus, in all the points enumerated, it is evident the ancient Hindu physicians observed minutely and well.

5. *Towns and Cities.*—In the seventh century A.D. the surface life in Indian towns was much as it is at the present day, and as it had been for generations before that time. Hiou Tshang describes the tortuous streets and lanes, the its are houses and verandahs with walls plastered with cowdung, in roof either of bamboos and dry grass or of planks and tiled. There was, however, under Buddhist rule, an absence of an butcher-shops and wine-sellers; but outside the cities were the secluded dwellings of the lowest classes of the people—the Chandalas. The dwelling-houses were inside elegant, but outside plain. The ground in front was strewn with flowers, especially in the morning. But, with regard to what may be called "conveniences," the nature of such arrangements, if indeed any of a special nature existed, cannot be detailed

simply from absence of information regarding them. In a climate of extremes such as that of India, with dry heat at one period, and heavy rainfalls at another, refuse matters are removed to a greater extent than would be the case in more temperate regions.

Of the great officers of State, those who had charge of *cities*, were anciently divided into six bodies of five each. The members of the first looked after everything relating to the industrial arts; those of the second attended to the entertainment of foreigners; they assigned to them lodgings; they watched over their modes of life by means of those persons whom they gave them for assistants; they escorted them on their way when they were leaving the country, or, in the event of their dying, forwarded their property to their relatives; when sick they took care of them; when they died they had their bodies buried and temporarily took care of their property; and this illustrates the manner in which the dead were disposed of in those *pre-cremation* days. The third body inquired when and how births and deaths occurred, with a view not only of levying taxes, but that births and deaths might not escape the cognizance of government. The fourth class superintended commerce and trade, weights and measures. The fifth superintended manufactured articles which were sold by public notice. The sixth class collected statistics of prices of articles sold. These classes are now more or less fully represented by our City Magistrates and Town Councils.

The *village* in fact became the basis of a political organization and type of the kingdom of which it was an individual member. The headman was the *rajah*; there was a council of elders. At a later period it had its own officials including accountant, *watchman*, priest, *physician*, musician, and artisans of various crafts. In rural districts *inspectors* observed the yearly inundations, and looked after the great

tanks or reservoirs from which the water was distributed by canals, so that the country might be equally irrigated.

6. *Public Health*.—Of the condition of public health during the Vedic period we learn that the people were afflicted with few bodily pains, the reason assigned being that the seasons were genial, the remark indicating that climate conditions in their relation to health were observed. At that time, and for long after, physicians were believed capable of recovering persons bitten by venomous snakes notwithstanding that in the treatment of such accidents they trusted to the then ordinary appliances of their science, namely, charms and incantations.

Manu was the first known improver of conditions having reference to public health. According to that sage "The king is to cause broad roads, drinking fountains and market-places to be constructed in his territory; medicines of various kinds to be prepared; herbs or medicinal roots and fruits to be collected; and to provide four sorts of physicians; to repress drinking shops, procuresses, loose men, gamblers and such like; to provide for the welfare and subsistence of the poor, orphans, old men, and widows." But the first real progress in matters of this nature took place many generations afterwards, namely, under Sandracottus. He utilized the philosophers or learned class by engaging them in the work of *experiment* and observation with a view to improve the productions of the earth, especially animals—in other words he established agri-horticultural institutions. Monks there were to seek out and relieve poverty and suffering; and in fact such works appear to have been carried out in India from time immemorial. The circumstance is also mentioned that as the people had a very *temperate climate* they were not subject to many varieties of disease. Among the many works of philanthropy performed by *Asoka*, "the Sorrowless," he established medical dispensaries

throughout the empire; he introduced a State system of discipline in moral conduct; he prohibited all convivial meetings on the ground that *much evil* attended such assemblages; a stringent law was enacted against such persons as were addicted to spirituous drinks, opium or other deleterious substances; an edict was passed that stores of medicinal fruits and herbs should be maintained throughout the empire for the benefit of human beings and *animals*; also that wells should be dug and trees planted along every high road. Fa Hien saw at the beginning of the fifth century in *Pataliputra* (Patna) hospitals that had been founded by the neighbouring nobility in conformity after the manner of those instituted by Asoka. To the poor, the crippled, and diseased of *all countries* were admitted; every requisite was supplied gratuitously; physicians inspected their diseases and ordered diet and medicine according to their respective cases. It is believed that the hospitals that had prior to that date been erected by the Kshatriyas were rather houses of shelter and entertainment for travellers than establishments for the reception and treatment of sick. Those erected by Asoka were more purely hospitals as we have just seen. According also to Fa Hien, at the end of the ninety-six heretical sects, into which the followers of Buddha became divided, erected *Punyasalas* or hospices by the side of solitary roads so that travellers might rest and refresh themselves therein and be supplied with all necessaries. All such establishments have long since ceased in India, but in Burmah they are still represented by the *Zyats* which occur at intervals along the thoroughfares, still known as "works of merit," now alas! disappearing under "the march of improvement."

7. *House-construction*.—The earliest Aryan town of which record is made was Hastinapura, some fifty miles north-east from modern Delhi. It appears to have at that distant date consisted of huts of mud and bamboos. At the same period,

however, the *Naga* people, among whom they had come, dwelt in cities, the precise construction of which is not stated in all probability was of similarly flimsy materials. That of Ayodhya had strong walls and gates, and, moreover, served as a garrison. That the advantages of houses elevated from the ground were acknowledged hygienically at an early period is evident from instructions contained in the *Ayur Veda* regarding the advantages during the season of living in elevated apartments. The ordinary kind of houses still remain much as they were in ancient times; they are raised from the ground by being built on prepared earth. The walls are similarly constructed with thatch is thick and extends beyond them so as to fit for protection from the heavy rains, ventilation being provided by means of a space left for that purpose between the walls and roof. The houses are divided into apartments according to the circumstances and conditions of the owners, those of a family or tribe occasionally together forming a series of squares for mutual protection. All these are usually kept clean. In other parts of India houses are made of fire-burnt bricks and are two or more stories high. In particular districts these are more or less fortified.

8. *Water*.—The ancient, like the modern, Hindoos were very careful about their drinking-water, and were very anxious to avoid various diseases to that of bad quality. They considered the water of wells or natural springs in the sandy beds of the hills as the most wholesome; that of rivers and of fountains at the foot of high hills as less wholesome; that from brooks or streams as was stagnant in tanks or reservoirs as the most unwholesome of all, predisposing to indigestion, obstructions, lethargy, dysentery, and fevers. Water was considered to be improved by boiling. During the rainy season the use of this boiled water mixed with a little honey was recommended; further, as more particularly narrated under the head of *seasons*

rules existed with regard to the quality and kinds of water to be used. In connection with temples and some public institutions the remains of ancient reservoirs and water-tanks still exhibit the care with which they were attended to. As already observed the excavation of public tanks was considered one of the most "meritorious" acts of public utility.

Intoxicating Drinks.—They had six different kinds of fermented and spirituous drinks: that prepared from the grape called *siddha*, from raisins *mārdvika*, from the flowers of *latifolia madhulaka*, from jaggery or goor, *guda* or *sura*. The *Shastras* the use of wine and spirits is forbidden; in the *Tantra* they are allowed, and the worshippers are indulged in their use. Spirits are described as "a kind of poison which taken in moderation and with food produce beneficial effects, being heating, pungent, subtile, light, placid and strengthening. When taken in large quantities these qualities are unfavourably on the humours, and instead of strengthening the body will destroy it. Spirits, like medicine, when taken in a proper manner restore appetite and strength to the body." Such particulars as are available lead to the conclusion that, in the early stages of society in India, the vice of drinking was general, and that the orgies of those days were very disgraceful. One of the many good results of Buddhism, however, appears to have been the diminution of drunkenness.

10. *The Social Evil and Polygamy*.—Among the earliest principles of Sakya Muni were "the wealthy courtesans of the great cities." During the Greek and Roman period of Indian history the public women were employed as spies of the government, those of cities being employed for this purpose, the civil authorities, those who followed camps, in other words, "wrens" by the military inspectors. But what will be said to this? At the ancient town of Rajagriha, to the

north-east of the city, and in a crooked defile, the Jivaka erected a *vihara* or monastery in the garden *pâti*, a celebrated and very beautiful courtesan, and not only twelve hundred and fifty disciples of but the *sage* himself to "receive her religious offerings." Buddha accepted this invitation and received from donor Amramaya the garden. The inference is clear disgrace was attached to the profession of a courtesan. During the Brahminic period the "chief courtesan" of Ujain was a person of great importance. It appears that then the prosperity of the luxurious India often depended upon the attractions of the *lâç* held that "proud pre-eminence," and her power of attracting the rich nobles and merchants from the surrounding country. Thus it is said "a princess of rare beauty and accomplishments was sometimes appointed to fill so equivocal a position." Nor was the courtesan always unacknowledged; the *wife*, the Hindu drama indicating that ladies of the class occasionally were recognised as part of the domestic establishment, with such results to comfort and happiness as may be readily imagined. When, early in the eleventh century, Somnath was captured by Mahmud, five hundred damsels, many of whom were daughters of rajahs, were found dwelling therein, their occupation being to dance and sing before the idol pillar. Parents consecrate their daughters even nowadays to the service of the deity in particular temples, where these often become mistresses to the priests and lead a life of prostitution.

With regard to the *sanitary* aspects of polygamy in ancient Asiatic nations, they are thus described by Rawlinson: "Polygamy destroys the domestic affections by diluting them; degrades and injures the moral character of the nation; lowers the physical energy and renders the people self-indulgent and indolent. Amos

the lower orders, feeling of self-respect becomes lost through taking money for their daughters from proprietors of harems; they become the ready applauders of crime and the submissive victims of every kind of injustice and oppression."

11. *Monastic Institutions*.—There appears every reason to believe that with the introduction of Buddhism monastic establishments were instituted with a *hygienic* object. Thus a large proportion of men who joined them were those who had been surfeited with pleasure, whose health had doubtless suffered thereby, and to whom a quiet regular manner of existence was in reality the best restorative. A strange mixture must those have formed who first took monastic vows! Besides those already mentioned, there were those without hope or joy in the world, voluptuaries, free-booters, filthy yogis, the healthy and the afflicted—*women* predominated. In connection with temples of various kinds the remains of which have of late years been investigated, the extent and completeness of some of their sanitary works furnish subject for wonder and admiration; this more especially with regard to reservoirs and aqueducts or conduits in Western India.

12. *Personal Hygiene*.—As in the Mosaic law, so the injunctions of the ancient Hindu sages with regard to matters of personal hygiene received the impress of religious ceremonies. Man was said to be like a coachman driving his own carriage; if this be well made and he continue to drive cautiously it will go a long time (100 years), but if he drives it upon bad roads the wheels will get injured and the carriage will soon get worn out. As a principal item under the present heading was personal cleanliness; the eyes of gods, so it was said, were too pure to behold *uncleanness*; hence numerous ceremonies were instituted, the object of which was to maintain *purity* of the person and command over the bodily organs. Among the observances which come within the scope of this

paper are the following, namely, to rise from bed sometime before sunrise; to perform the functions of nature with the face towards the north; to clean the teeth, using for this purpose a fresh branch of the *Melia azdirachta* (a bitter tonic) or *Mimosa catechu* (astringent), washing also the mouth and eyes; the teeth however not to be thus cleaned before the tenth year of age. It was forbidden to use a pot touched by persons defiled; to eat rice cooked by, or have intercourse with, women of low caste,—both of which injunctions have a very obvious hygienic bearing. The practice of anointing the body with oil was looked upon as conducive to health; mustard or other fragrant oil was most frequently used for the purpose, but it was laid down that the body should not be anointed at the beginning of fever, an injunction that doubtless commends itself to physicians even at the present day. Exercise was enjoined; for the sake of health limbs were to be shampooed, the nails, beard and moustaches and hair to be cut every fifth day, the hair to be combed and cleaned. Several kinds of *baths* were recommended; cold bathing removes the inordinate heat of the body, but if with very cold water in winter it deranges the “phlegm and air,” in hot weather it increases the bile and blood; bathing is not proper in diarrhoea; bathing the feet removes impurities, local diseases and fatigue; then follow instructions as to the suitable times for bathing, having reference to business and occupation of individuals. The warm-water bath is recommended for relieving pain, and in different kinds of fever. The vapor bath is similarly employed for both those purposes. In cloudy days exercise was *not* to be taken in the open air; the bed-room should be warmed with fire; and persons should sleep on a charpoy. In autumn exercise is to be taken in the evening; sherbets and spirituous liquors are to be used. In winter the warm bath to be used and exercise taken in the morning. In spring the drinking water is to be

boiled; spirituous liquors to be mixed with it; the warm bath to be used, and exercise taken. In the hot season light food and curries to be used; the cold bath and light dresses; the body smeared with cooling aromatic applications; cool water to be used as drink, and sleep allowed during the day. Lastly, Charaka states that there are three means of preserving life—proper food, sleep, and proper government of the senses and passions.

13. *Food*.—As already observed, the inhabitants of ancient India were well-supplied with food as with other requirements. It is recorded of them in the sixth century before our era that they had abundant means of subsistence; that they inhaled pure air and drank the very finest water. All kinds of fruit appear to have been cultivated; in addition to cereals there were grown throughout the country much millet, pulse, rice and many other plants useful for food, all these being well-watered by the profusion of river streams—a remark which, applied as it was to the Punjab and adjoining districts, shows how different was then the conditions in this respect from what they now are. Famines were scarcely known; and as two rainfalls occurred each year, so were two crops of cereals obtained. In the third century before our era guests of Sandracottus at Patna were treated to rice and different kinds of meat “dressed in the Indian style,” that is, doubtless as curries much the same as at the present time. At that time a large portion of the agricultural produce of the empire was stored up in the royal granaries and disposed of partly in the maintenance of the army and civil administration, partly sold to the trading and manufacturing classes. About this time the sacrifice of animals in Buddhist India was prohibited, involving as it did the use of their flesh as food. It is however specially noteworthy that the prohibition in question little affected the population of the Gangetic valley who had subsisted on grain and vegetables for unrecorded ages, although they had

always sacrificed animals to the gods, especially to the female deities, who, it is said, revelled in flesh-meat and strong liquors. Fa Hien described the food and some of the social conditions of the inhabitants of the territory between Agr and Kanouj. No one except the Chandalas, i.e., the very lowest class, killed any living thing or drank anything intoxicating; there were no shambles and no wine shops.

According to the earliest works on Hindu medicine, many rules with regard to food were laid down; a few examples of which follow. Pumpkins, mushrooms, bamboo-shoots, plum dried vegetables, unleavened bread, pig's flesh, salt, spirits when eaten or drunk with milk resemble poison; rice which has sprouted, *masha* (*Phaseolus radiatus*), fat, honey, milk, jaggery when eaten with flesh of domestic or amphibious animals, or with fish, are so bad as to resemble poison. Milk with honey and vegetables in general should not be used together. According to Charaka there are six kinds of food, namely, *soft* food as rice; *soft sweetmeats*; *hard* food that requires chewing to prepare it for digestion; *drinks*, liquids that are lapped; and food that is *sucked*, as mangoes, sugar-cane, &c. Then there are six different kinds of food classified according to their taste; these are sweet, acid, salt, bitter, pungent, and astringent, regarding all of which minute rules are laid down. "For ensuring good digestion, it is said, the passions must be regulated; the person must sleep at night in a protected room; he must use warm water; take bodily exercise; such observances are considered to be most necessary to health."

Although in Vedic times there was no law against eating animal food, nevertheless as in the Mosaic Code, so Buddha, the son of *Manu*, prohibited as food the flesh of pigs; and other articles of food similarly prohibited were garlic, onions, mushrooms and all vegetables raised in dung.—The object with regard to hog's flesh being apparent, but

is not with the onions and garlic; at any rate, that moderate, if not tolerably free indulgence in the "pleasures of the table"—only that there do not appear then to have been tables—was permitted, is tolerably apparent from one of the injunctions having reference to this subject which may

here reproduced, namely, "a virtuous moderation, eating meat, drinking fermented liquors produces *signal* compensation." The remark is peculiar. From the account given of the return voyage to China of Fah-Hien the circumstance is made tolerably evident that, although the principal food stores laid in for that voyage consisted of rice and fresh water, the use of fresh vegetables under such circumstances was well understood; thus it is expressly stated that, when the ship in which he sailed touched at Ping-Tu-Chow, a supply of fresh water and of fresh vegetables was taken on board.

Sleep.—As with the modern Indians, so in ancient times an approved maxim was "early to bed and early to rise." They slept upon a mat and used a small pillow, and being either upon the ground or on a *charpoy* according to circumstances. There were various rules with regard to the position of the sleeper; sleep was said to be promoted by the purity of mind, by music, working, anointing the body with oil, the use of the bath, by eating new rice, milk and sherbets and spirits, and such articles as improve health.

Clothing.—The rules with regard to clothing were the same as follows: After bathing the body to be rubbed with a piece of clean cloth; silk and warm red clothes should be worn in winter; the clothes should be light, cool and thin in the hot weather; in rainy and cold weather warm clothes of medium thickness should be used; care should be taken always to wear clean clothes, which is good for the skin, looks well, and promotes happiness and longevity. A turban defends the head from heat and cold, sandals

strengthen the feet and protect them. The *umbrella* protect the person from rain, wind and dust. A *stick* protects the person against beasts, and prevents fatigue.

16. *Physicians*.—According to Hindu mythology one of the precious gifts obtained by the *churning* of the ocean by the gods or *Devas* and demons (giants) or *Asuras* was the physician in the person of *Dhanvantari*, carrying in his hand the water of life, *Amrita*, drunk by immortals. We also read that the physicians to the gods of the vedas were the two *Aswins*, sons of *Surya*, the sun, other personifications respectively of *light* and *moisture*. *Dhanvantari* called also *Devadasa*, having, it was said, practised medicine with great success in Heaven, descended to earth to cure men's diseases, and to instruct them in prevention (hygiene), as well as in curative medicine. He subsequently became King of Kasi or Benares.

The first member of the *Vaidya* or medical class was of miraculous birth. Subsequently Manu laid down rules with reference to the science of medicine and its practice, the aptness of many of which must still be acknowledged. For example, he thus describes the qualities of a medical student: He should be of respectable birth; inquisitive, observant, not covetous, jealous nor inquisitive; should be a philanthropist, and his disposition should be amiable and happy. The indications of such qualifications are: an agreeable voice, a small tongue, eyes and nose straight, lips, teeth short which do not expose the gums, and thin which retains its vigor. As to his duties he should know the causes and varieties of disease and the means of prevention and curing them; he should be acquainted with his position; he should be acquainted with anatomy; some diseases are cured immediately by a good physician, some simple diseases are increased much by the want of assistance; these principles were laid down more

thirty-seven centuries ago. He should perform his necessary preparations before visiting a patient in the morning, and should visit his patient in a *clean place*, not in one where there is hair, bones, spikes, stones, chaff, broken stone vessels, charcoal, nor in impure situations.

Although according to Manu, among the official functions belonging to individual villages, the physician was enumerated, the circumstance would appear tolerably evident that at the date of the Mahabharata the position held by the physician was not remarkable for its dignity; thus, when the Kshatriyas of Srngavera went out to meet Bharata, physicians were enumerated with bathmen, dealers in incense and stilt-walkers; and yet by other allusions met with in history referring to that period, there is every reason to believe that professors of the healing art were held in high estimation.

In the third century B.C., next in estimation to the priests, the Buddha was the class of physicians engaged in the study of the "Nature of man," that is, of physiology. These lived mainly on rice and meal which were freely supplied to them by the people. One class of physicians at the same time were the *Sramans* or hermits; these hereditarily engaged in the study of the diseases of their fellowmen, and did not accept of any recompense except the dole of food as above stated. It is about this time that *Sakya Muni*, while suffering from internal complaints, is believed to have been by his physician *Jivaka* treated by means of *opium*, the effects of which drug, according to tradition is to be credited, first impressed the sage with the idea of *Nirvana*. The history of *Jivaka* is peculiar, the name is causing life; he studied in Benares and seems to have been a household physician to "the great reformer" of that age.

Theory of Disease.—The early theory regarding the origin of disease is somewhat thus: Mankind, as a consequence of wickedness, became divided into sects, ignorant,

restless, unhappy and afflicted with numerous diseases. According to the Atraya all diseases spring from immoderate actions; all resemble *hell*, the curable as well as the incurable. Among the predisposing causes of illness the following are enumerated, namely, carrying heavy weights, severe exercises, much study, falls, fast walking or other violent movements, using too much or unsuitable food, exposure to cold or to damp air, &c. With reference specially to fevers they were considered to be caused by exposure to the morning sun while fasting, by fatigue, fear, grief or watching; drinking stagnant water into which withered leaves had fallen, by visiting a new climate, the two latter causes having at the present time an additional interest attached to them in connection with existing theories of the origin of this large class of diseases. According to the same ancient work, the manifestation of disease depended upon derangement of the "five elements," namely, ether, air, fire, water and earth, so by the same theory restoration to health was effected by diminishing or increasing those that were deranged in reference to their indications. That the influence of local and climatorial influences was at the same time acknowledged is evident from the heading of the fourth chapter of the *Veda*, namely, "On the influence of soil and seasons, of moisture and temper, and on the influence of the winds."

Some of the rules laid down regarding the treatment of disease may not even now be altogether without their value. Thus a disease is to be examined by means of the five senses. Active treatment should not be employed in a slight disease nor mild treatment in an acute disease. Should the treatment employed be doing no good, it should be changed, when the symptoms are yielding under a particular plan of treatment it should be continued. According to *Susruta* medicines given in small doses are like throwing a bucket of water upon a large fire, which rather increases than cures

it; if in too large doses they will be liable to produce further diseases. Medicine should be administered according to the strength and age of the patient, and nature and stage of the sickness. After the physician has visited a patient, and found the disease be complicated, he must detail the symptoms, and call in other physicians to consult as to their nature and treatment, a principle by no means unsuited even to the present period.

8. *Hygiene in Curative Treatment of Disease.*—Among the instructions for physicians laid down in the early works already quoted is that on being first called to visit a patient inquiries should be with regard to things eaten and other circumstances likely to have caused the disease; the signs of the disease; in other words, the physical condition of the person; the nature of the disease; the seasons of the year; from what country the patient came; his temperament; the food he has been accustomed to and so on. The treatment is begun by strict injunctions with regard to the diet to be taken, a principle having been adopted by the ancient Hindu physicians that, "if a patient does not attend to his diet and does not use good medicines will not remove the disease;" hence physicians were directed to be careful with regard to diet according to the season, and the kind of vessels used by them. In the 19th century of the present era the Indian physicians are still to be found to have mistrusted powerful remedies in the treatment of disease and to have placed their chief trust in diet, regimen and external applications.

II.—ARMY HYGIENE.

Soldiers.—During the Vedic and Brahmanic periods there existed a distinct class of warriors altogether separate from the civil population. In the latter of those periods the army was composed of the soldier caste, that is the *Kshatriyas*, the merchants of the *Vaisyas*, the agriculturists

of the *Sudras*. Then, as in the time of Bharata, the regu army was paid, clothed and fed by the State, and all liberally that soldiers could with ease support themselves others. On service they were accompanied by their w and families. In war they were prohibited from molest the husbandman; hence it was said, while the former w engaged fighting and killing each other as they could, latter might be seen close by tranquilly pursuing t work, perhaps ploughing or gathering in their harv or pruning trees, or reaping their crops. The conti is remarkable as compared with war during the lat quarter of the nineteenth century of the Christian In times of peace they underwent their *drill*, they empl their time in hunting and athletics, gambling with or pursued romantic and often lawless amours; in not very unlike what one reads of with regard military classes of certain advanced countries at the t time. In the third century B.C., the army of Sandra was "not composed of contributions from feudatory pr. but was a vast standing camp maintained solely a expense of the king." *Mobilization* was then an easy m for the troops were always in a state of readiness to on an expedition "furnished with all that was req throughout the campaign." In the seventh century, ac ing to one account armies were raised according to necessities of the state, soldiers being encouraged to en by promises of large rewards. This account however flicts with that given by Fa-Hien.

Young Kshatriyas, that is men of the 'soldier caste, trained to fight with their fists, to wrestle with their l arms, to throw stones and brandish clubs. At a lat they were taught to shoot with bows and arrows, to quoit or *chakra* (in which art the Sikhs excelled up to our wars against that power in 1845 and 1848), to wield sw

ars, to tame horses and elephants, and to drive in g withs. Thus, having reference to the conditions of the temod, the circumstance is tolerably clear that great attention as paid to the drill and training of troops in ancient India.

The relative value of old and of young soldiers was perfectly demonstrated during the expedition of Alexander to the Punjab, the army with which he successfully met Porus having consisted of *veterans inured to battle*; the circumstance however still bears its lesson that the same army, worn out by fatigue and sickness, absolutely refused to advance from the banks of the Jhelum to Palibothra, that is *Pencha*, as that great commander originally intended. Had ranks been reinforced, and more ample provision for his and wounded existed, there is every reason to believe his original intention would have been carried out.

Uniform.—That soldiers wore a particular dress or *numa* in the time of the Mahabharata appears to be placed and doubt. Thus in the great war for the restoration of Pandavas the respective armies wore *armour*, and were otherwise well dressed. Babhruvahana, Rajah of Manipura, the occasion of being visited by his father Arjuna, ordered all his troops should be in readiness in their parade dresses, that all the men and women of that city should go out procession, and, according to the record, a very gorgeous session thus took place. The ancient armour alluded to bears to have for the last time been represented in the mail worn by the *Khalsa* soldiers during the Punjab of 1845 and 1848; the more usual *uniform*, alluded to as quilted jackets, is still seen in the north of India.

Rations.—The scale of food, particularly during war, is to have been peculiarly liberal. Thus when Bhima for his battle against the Asura, his provisions were a load of kiehri (rice and dholl, *Cajanus Indica*) a *regal*, and a huge jar of ghee, that is clarified butter. with

Here is symbolized the first war by the Aryans against the aboriginal or Turanian inhabitants of North-Western India. The ordinary food of the Kshatriya of the Vedic Aryan was far from consisting of the simple diet of the rishis, was such articles as roasted horse-flesh and venison dried in the sun, their beverages were fermented liquors and strong wine, or rather spirits.

4. *Beverages*.—There is no doubt the military classes among the Vedic Aryans were immoderately given to drink. Among the very earliest characteristics of the *Kshatriyas*, was that "they revelled in fermented liquors," and probably also in strong wine. The Marattas, as a preparation for battle, not only made themselves intoxicated, but also rendered their elephants so. But in those days excess of all kinds appear to have been the fashion of the time, not only among the military, but also among the civil classes.

5. *Forts*.—The hygienic rules regarding forts were distinctly laid down, albeit they were not what would be considered very complete. In the Ramayana the statement occurs that such positions should be supplied with weapons, money, grain, beasts, Brahmins, engines (artillery), grass and water, the latter an important requirement still is. *Palibothra* in the time of Sandracottus is given as an example; the history of that city being, as said, traceable back to the Indian Hercules, the Balakrishna, brother of Krishna Belus or Baldeo. The fortress was of the shape of a parallelogram; it was girded by a wooden wall pierced with loop-holes for the discharge of arrows; it had a ditch in front, probably communicating with the river, for defence and for receiving the water of the city. Such appears to have been the state of that city from about 1000 B.C. to A.D. 600 when it was destroyed, and, considering the succession of seasons and the conditions, meteorological and otherwise in Behar

ination seems necessary to form an idea of how old *Palibothra* must have been. Tientsin in 1861 was an apt illustration to our officers and troops, who had and the previous year occupied that port situated not far from Peking.

ies on the march.—During the Vedic period on the march presented a motley appearance. Taking following as an example, there were in his camp a great number of tradesmen and artisans, of women of the lowest character, gay women, flower women, milk women, serpent charmers, monkey leaders, all kinds of pedlars and other men,—all, be it observed, presenting elements favorable for the development and propagation of disease. When many centuries afterwards Sandracottus started from *Palibothra*, whether on a hunting or expedition, he was attended by Yavana women, with bows in their hands and wearing garlands of flowers. On such occasions soldiers were supplied with horses, elephants and waggons, all being taken from them (or accounted for?) after a campaign. In every chariot four men, namely, the driver and three attendants, were required. On the line of march these chariots were drawn by bullocks, the horses belonging to them being held in reserve. Just before action the bullocks were unyoked, and the horses then yoked to the chariots.

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The march of an Indian army has been thus described. On the march and encampment there is the great object of obtaining water; a large supply is not everywhere obtainable, particularly at certain times of the year, and in regard to it has been reduced to the greatest distress with milita

by being deprived even for a short time of this : On arriving at camp a great flag leads the column division takes up its position beyond the standard regularity or order; the chief pitches his tent in front of his party, the men being arranged around with regularity; their shelter such only as can be effected by mats, grass or branches. In an army in movement utmost profligacy prevailed; the establishments in Bengal as *lal bazaars* existed in every camp and were resorted to, the generals making by them a source among the followers were mountebanks, magicians, jugglers, tellers, thieves, beggars and all sorts of *useless mouths*. In an army of 25,000 fighting men there was a *fold* of some 200,000 persons, or even upwards. In fact the armies of India in the most ancient times regarding we have a history, as were those of England in the Crusades, so in India they continued to be even time when *red* became the color upon the map of the *king* province.

7. *Camps*.—In Vedic and Brahmanic times, more recent date, camps speedily became then however there was at least one class to whom evil smells, and consequently stood an abomination; and of whom it is related distressed with things of evil smell." On the grounds great consideration was paid to the supply of some water; thus in the story of Danu's caravan is described as encamping by a forest with lotus flowers, that is *Nymphaea lotus* cultivated by Hindus. From this circumstance the fact was then understood that stagnant water non-malarious by means of living vegetation.

The following particulars regarding the story of Mahabarata, namely, a

ing with fodder and fuel, not trespassing upon burial-places, temples, places of pilgrimage or hermitages of holy site to be commodious, agreeable and well watered. The site was measured for the camp, carrying it on one side of the sacred river *Kurukshetra* which was flowing with pure and salubrious waters undefiled by mud and filth. When done, *Kesava* directed a deep ditch to be dug on the sides for the greater security of the camp. The army then marched into the enclosed space and "were obediently to the precepts which regulate the practice of encampment." Whatever was proper to do on such an occasion *Kesava* commanded to be executed; stores of fire-wood of all necessities for eating and drinking were collected; large and handsome tents were erected severally for the army; artificers dexterous in various handicrafts were employed in numbers, and *skilful surgeons* were in attendance provided with the means for healing wounds; quantities of ghee, and resin and fuel, and piles of bows and arrows were heaped up like mountains, and *Yudishthira* observed that, in every tent, fodder (food), fuel and water were provided. Great "engines of war," iron shafts, bows, arrows, drivers and elephants like mountain-trees and covered with harnessings of iron were collected in the camp by hundreds and thousands. When the army knew that their friends had taken up quarters, they removed with their own baggage to several stations, and the kings, their allies, and their triumph, "observed in their encampment of self-denial, liberality and religion." It is evident that a considerable degree of order and regularity was observed in the armies of those times. It does not however appear to be handed down to us the details regard to arrangements now deemed essential in military encampments.

In the camp of Sandracottus, several centuries later recorded that the greatest regularity prevailed; his consisted, it is said, of four hundred thousand men, camps were maintained in good order and discipline, useless or disorderly multitudes were tolerated in them; it is particularly mentioned that theft was extremely rare.

8. *Rules of Combat.*—In battle the proceedings of the fighting parties were after this manner. The *Kauravas* and *Pandavas* sallied from their respective camps each morning, they engaged each other in masses and by single combat; the survivors on either side returned to their respective camps at sunset and passed the night in perfect security. Their actual manner of fighting at a distance, each sending his contending forces sent showers of arrows at each other; in closer quarters men fought each other with clubs, spears, swords and clenched fists; they cut and hewed and bruised and kicked until the conqueror threw down his adversary; he then severed the head from the body, carried off the head as a trophy, sometimes drinking the dripping blood as he did so.

So long as men were actually engaged in actual combat, we learn of the armies of *Arjuna* and *Duryodhana* that it was to slay or be slain, but “when we leave the battle, your people and your people are free to mess about together, come and go to each other’s quarters as they please.” Fugitives, suppliants, drum-beaters, and chariot-drivers were treated as non-combatants and were not expected to fight with horsemen or with riders on elephants, warriors in chariots with foot-men with foot-men. Fighting arms against another without first giving notice was considered unfair; the use of a poisoned or barbed arrow was against the laws of *Manu*; it was contrary to the law for a person to interfere between two while engaged against each other in the actual fight. Quarter was given to the vanquished.

who had lost their coats of mail, to those disarmed, or
 or "terrified" or running away. To the modern
 for *neutrality* as practised in Vedic times the
 "Principle of Geneva" is applied in token of its recent
 origin as a result of very far advanced civilization. But
 the principle of non-interference between two warriors while
 fighting against each other no modern name is applicable, the
 principle itself having been ages ago swept away in the onward
 march from barbarism. The wounded and the dead were left
 in the field except in the comparatively rare instances of
 the death of men of special rank; these were removed from the
 field by no means in every case; so we read that in some
 cases a chariot was mounted over a wounded warrior as he lay
 on the ground and so continued during seven days, at the end
 of which a path came to his rescue. According to the other
 version, followed on the same occasion, an enemy
 was to be treated in the enemy's country or
 elsewhere.

It is said in some instances to have lain on the
 ground during eighteen days, at the end of which
 finding an Indian climate, birds and beasts of prey,
 and skeletons could have remained. The dead
 lay upon the field. The bodies of chiefs, being first
 covered with funeral cloths, were incinerated, their pyre
 of sandal and other odoriferous woods and sweet
 bodies of the ordinary classes were wrapped in
 coarser materials, their pyres composed of faggots
 and poorer quality of oil. After a battle, carts were
 conveyed burning materials for the above purposes.

Pradyumna.—On the occasion of the battle between Babhru-
 Manipura and his father Arjuna, when the latter
 was killed, Chitrangada, the mother of the former, hearing
 of the chieftains taken prisoners was Pradyumna,

son of Krishna, sent surgeons to dress their wounds in handsome apartments, and entertained them with food and sweetmeats; in fact, established *ambulatories* for them, as similar establishments of help are present

Although the following instructions had reference to physicians, they are considered as more appropriate place as coming within the sphere of the army officer or surgeon, namely: "The duties of a physician, when a rajah travelled, was to point out the road, that is, the way which he was to proceed, also the water and shelter for the accompanying troops or followers and for the elephants; he should live near the rajah; his care should be to provide the water and food of the army as well as of the rajah, and to remove the burthen which the enemy may endeavor to impose on the army, and, it is added, the good physician may determine the means of saving the army." With reference to the more immediate duties of a surgeon in the army, it is to have been but slight in the time of the Indian physician Sushena, physician in the army of *Hanuman*, the monkey, who were wounded in the fight which led to the death of Ravana in Lanka, that is Ceylon, by means of which, having beaten and made into a paste, he then

Susruta, like Machaon, appears to have in some degree at least performed and taught the duties of an army physician. Thus in the *Ayur Veda*, of which he is believed to be the author, there are instructions with regard to the influence of the weather on health, on the regimen of patients, on the treatment of surgical diseases, besides dissertations on the duties required for accompanying a rajah in the army, the difference of climates, a description of fluids, and of the preparations and articles of food, besides a chapter on toxicology and one on intoxication, the whole, in fact, a compendium in which are included questions of hygiene, which some so-called "Sanitary reformers" would

only quite lately been enunciated by themselves in modern history.

Sanitary measures.—In the history of the early Aryan India a remarkable example occurs of the utilization of the mountains as a sanitary measure for troops. No doubt is to a great extent mythical, but like the major part of the history belonging to the same category, may have some foundation in fact. Thus, then, it is stated that when a great heat and pestilence broke out among the troops while he occupied Upper India. To prevent the spread of the pestilence Dionysos dispatched his army to the plains to the hills, which were taken by him for this purpose. Here the soldiers recruited themselves with cool breezes and by the water that flowed from the mountains.

At the time of Hiouen Tshang, some traces of this custom are said to have still existed. An Indian army, when in the mountains, moving about here and there, the soldiers were recruiting their health in these cool breezes, the inhabitants of the country—which is Northern Afghanistan—wore felt garments, to obtain the cool of the mountains, and in the villages they sought shelter among the villages.

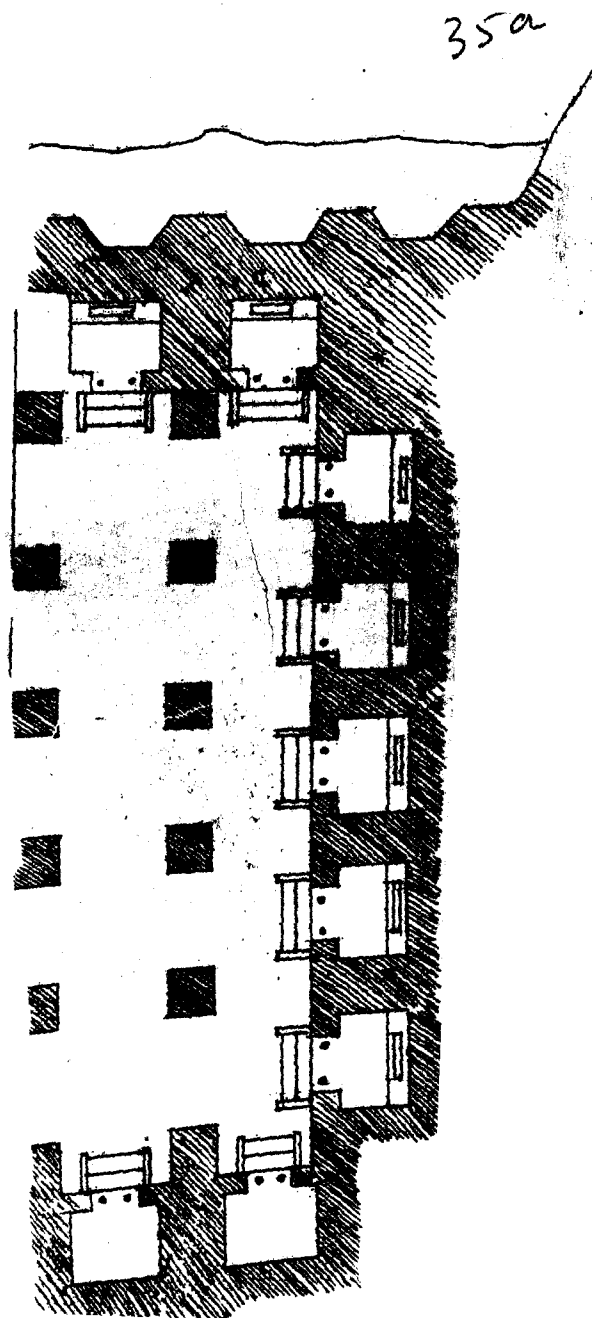
C. A. GORDON.

II.

ANTIQUITIES OF MĀMANDŪR IN
ARCOT DISTRICT.

Six miles south of Conjeveram is the village of the Arcot Taluk of North Arcot, chiefly known with its large and picturesque tank, which is one of seventeen villages in addition to those of the Arcot Taluk. From the surface of the level plain which is the surface of Arcot, and extends into the neighbourhood of Chingleput, rises a small cluster of granite boulders heaped upon the most part, of confusion. The principal elevations of confusion. The principal elevations of confusion, linked together by an earthen rampart, thus been formed. From the surface of the earthen rampart, which, when the tank is full, covers the surface of the tank, miles, rise a number of rocky islets of granite. In the cold season by flocks of water-fowl. Behind the Jewādies behind them, form a charri or chattri, the distant west, and Māmandūr would be accounted of its natural beauties, even if it were not an attraction.

But what makes the place chiefly known but to a few: and a description of the place may be found not uninteresting. It is a collection of rock-cut chambers, dolmens of various construction, and inscriptions upon rocks more or less ancient.



caves are four in number, each facing and excavated in the face of the hills which d of the tank upon its southern side. The from Conjeveram are within a few yards of similar in size. The face of the rock having undicularly, a narrow ledge has been formed,

chambers stand, each having two pillars f, and cut at the top into the form of corbels corresponding couple within. The dimensions are 20 feet broad, by 10 feet deep, and pillar being 2 feet square.

The first chamber are ornamented with lotus relief, and in the middle of the rock behind doorway, 2 feet broad, leading into a cell square and 5 feet high, at the back of which dge with a hollow in the centre, probably for of an image. In the left hand side are the inscription in strange letters which are unknown of the neighbourhood, but which appear to be ese (?). The face of the rock has either flaked n off, so that the major portion of the inscription terated.

chamber has pillars without ornament of any sort, to three posterior cells similar to that already he space between the doorways has been ix panels, each containing a human figure 4 feet ighly cut in relief. The two on the left clearly les, since they are bearded; those in the middle ed for females, judging from the face, and head- ged in large rolls on either side with a great pile crown. The remaining sculptures are clearly it all six are very roughly executed, neither fingers eing delineated. Upon the side walls are inscriptions

in Tamil and Grantham, mixed with characters; but the sounds expressed by them convey no meaning, although the Tamil word (light) occurs more than once. These seem in the writing met with in the first chamber.

About a quarter of a mile further to the largest of the excavations, the plan of work on a fly leaf.

It is constructed on the same principle as the first works, but has evidently never been finished. There has been made on the southern side of the main galleries to meet the interior corridors, and on the walls inscriptions. As in the smaller halls, each couple of steps leading up to it, and ornaments carved just above the floor and below the rock side of the sill, hollows have been let into the rock corresponding ones above, evidently for the purpose of wooden doors.

The fourth excavation calls for little notice. It is on the same scale as the two first, and has never been finished.

All these caves are, by the people, attributed to the Pandavas and called the Pancha Pāndava Dēval. A similar excavation five miles south-east of the town on a hill called the Pancha Pāndava malai, bears the appearance of having been the work of Jains, for a representation of the objects of their worship is cut upon the rock at the entrance, and other figures of the same kind are elsewhere upon the hill. It may, therefore, be concluded that the Māmandūr caves owe their origin to the people who are known to have flourished, many centuries ago, in the Conjeveram and the country round it. In the taluk of Conjeveram and Wandiwash they are still numerous, but the knowledge of their previous history, only retained

with the Brahmans, traditions of the cruel persecutions which they were subjected by the latter. In their prosperity the Māmandūr hills were doubtless the resort of a party of Jain monks, who occupied the caves in cutting out of the rock retreats, in which they hid their idols, and apply themselves to worship and were protected from the sun and rain.

The path leads among boulders fantastically arranged in a long bank bund. At first sight there is nothing remarkable in their appearance, but a closer examination reveals that at many points there are those strange monumental sepulchres

known as dolmens, which are frequently found in India. The ordinary dolmen is constructed of six or seven large stones, forming a cubical chamber, and in the middle is invariably cut a circular aperture about 18 inches in diameter. The specimens found at Māmandūr, however, have a character of their own. Many of them have fallen into ruin, but one close to the path is in a good state of preservation, and affords a good example of what all were. It is regular in shape, the dimensions of the enclosed chamber being 10 feet square, with a height above the soil of not more than 3 feet. Excavation to a depth of 3 feet more than the flooring stone, and the rapid percolation of water from the adjacent paddy fields made further trial. The roof is a gigantic mass of granite, evidently quarried locally, measuring 12 feet each way with a thickness of 12 feet at the edges, and more than 2 feet in the middle. The enormous mass has been raised upon several upright stones 10 inches thick, which are buried in the soil to a depth of 10 feet, and are roughly fitted one by the side of the other. No attempt has been made to shape them artificially, but the numerous interstices

are filled with small stones mixed with clay or other wall upon the eastern side presents a door-like opening 20 inches wide, between the stones which close

The other dolmens which are observable in this are generally smaller than the one described, but the thickness of the roofing stone in each excels and makes them even more wonderful than the structures of the kind in which the roof is made of only 8 or 10 inches in thickness. Fine collection of usual style of dolmens may be found three or four north-east of Chittūr in a valley near the village of Gunta, and again near Bāpanattam in the Palmar in both of which places nearly a square mile is covered with these ancient sepulchres, arranged in lines, and presenting the appearance of a desert.

Like the caves, the dolmens are, by the people to the Pāndavas, being called Pāndava temple. It appears to have been yet discovered regarding them that it is a curious coincidence that the Kurumbas are found in large numbers on the plateau, which is west of the North Arcot District, still erect dolmens on a small scale. Their temples are surrounded by stones enclosing a small extent of land covered by monuments, constructed with only three walls each formed of a single flat stone. The fourth wall instead of having another wall with the centre. They explain that upon the death of the head (G) of their clans, one of these structures is raised, at the spot where his body is buried. It is merely of him, and here offerings are made, and worship at intervals for the rest of his soul. The Kurumbas call with the Kurumbas of the plain country, the language of each being Canarese; and Conjeve

been the capital of the Pallava rajahs, who was, it is perhaps not unlikely that the dolmens are the work of that people. Again, the Kurumbas became converts to Buddhism, and had many at their capital, so that we may credit the same with various cuttings in rocks which are found in the district and elsewhere. One temple of this kind now at Mēlpādy in the Chittūr Taluk, admitted locally as a Jain shrine, and proved to have been such as is close to it. A sthalapurāṇam of the neighbourhood refers to a Korava (probably Kurumba) king as existing at ancient times near Mēlpādy, which to some corroborates the suggestion that the Kurumbas were the makers of our rock cuttings.

Other objects of interest at Māmandūr are four

Three of these are upon stone slabs, now buried under the tank bund. The upper lines being inscribed exhibit writing in Telugu, Grantha, and Devanagari, clearly of no ancient date, and probably giving the name of the constructor of the tank, and the date. One Venkatapati Naidu is popularly believed to have founded, and called the tank Chennasāgaram, a name alluded to in it. He is described as the same person who is known to Madras (Chennapatnam). If so, he must, of course, have been that Damerla Venkatapati Naidu, Rajah of Madras, who, in 1639, ceded Madras to the Company, and for which it should be called after his father Chennappa. The name he seems also to have attached to the tank.

The fourth inscription is a very lengthy one, upon a great rock under the base of one of the hills, and close to the edge, in the limits of the village of Dūsi, which is near Māmandūr. The rock is more than 20 feet long,

15 feet high, and 12 feet deep, and upon all inscribed Tamil and Grantha characters interpreted language is Tamil and is easily understood, and relates to a grant of land, in S.S. 1505, to the head Conjeveram by Sri Ranga Vira Maharajah Ragh of Chandragiri, who styles himself "Lord of and of the country which lies between the north-eastern, and western seas."

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III.

NAMES OF PLACES IN TANJORE.

A list of place-names was collected during the year of 1877-78 whilst conducting the Madras Coast Great Trigonometrical Survey of India through the District. My prime object was to find out by enquiry on the spot the correct vernacular form of the names of places that I must submit to the Surveyor-General for publication on the charts and records of the work. I am surprised, therefore, to find that the names of all the survey stations, topographical features of the ground mentioned on the maps, the surrounding villages, and the divisions to which they belong. A few other names which are also included.¹

Many of them seem peculiarly unhappy in their rendering of the original names. Most of them would perhaps admit so far as to be quite averse to learn and adopt any system of orthography by which alone the stigma of error is removed. The earlier sheets of the engraved map of the Indian Atlas—are covered with irregularities of orthography and mistakes, many of them misleading and very ludicrous. Some of them are due to the carelessness of the engraver in London and the bad writing of the copyist, but had there been any uniform or acknowledged system of orthography, the copyist might have detected

¹ The names and etymologies here offered must be regarded as crude and not as having any pretensions to scholarship or research. They are simply a desultory collection made by a student in a certain locality, during a busy tour of a few months.

the errors or 'idiosyncrasies' of the writer insteading them, especially if he had possessed lists such as is here offered, only properly completed. The Government has now determined to adopt if it will adhere to it and carry it out consistently in publications and departments, the coming generation into the way of it insensibly and with greater ease than present and past generations have enjoyed in unsystematic practice hitherto current, so that we may hope that the literature of the future will be free from blunders and irregularities that now disgrace the present and so puzzle the new-comer and the foreigner. It has been made in this paper to carry out the approval of transliteration, but the first gazette of the Madras Government on the subject (dated 20th August 1861) is lamentably defective that its application to Tamil is very uncertain, and even the amended publication in the revised gazette leaves much to be desired.

Besides obtaining the correct form of each name, helping to improve our maps, I thought that this might prove of some use to the gazetteer (or the historical writer, and of interest to the traveller, the gistical inquirer, the ordinary reader and writer, the mapmaker; also to any one else curious in such matters, as throwing light on the history and habits of the inhabitants, on the physical features of the country they dwell in, the language they speak, and to which they belong to.

All proper names were, or were originally derived from words or sounds having a meaning; but process of time, the long continued wear and tear of familiar use, rubbed off the corners that were rough to the touch, have run together the liquid parts that most easily separate. With the original form the meaning has also

is very difficult, often impossible, to discover the local circumstances and traditions occasionally trace the etymology whence the original form may be reconstructed or fairly guessed at; but there is a general impression that the tradition itself has been lost to account for the name. It is not, therefore, to be said that the names here given and their etymology are correct, but they may be accepted as the current local explanation as given by the village concerned on the subject. Their answers were somewhat contradictory; some declaring the name had no root, whatever, nor ever had any, but was simply the name which they and their forefathers had used from time immemorial; whilst others were as quick in giving a derivation or explanation of which several were forthcoming for the same name. A few only here offered a reasonable origin, explaining the variations and contractions that the name in question had undergone, and appealing to the authority of existing facts, or to history that could be consulted for confirmation.

These were perhaps the modern instances upon which further light was to be had from the Sanskrit name of the temple or name of the local deity, to whom it was dedicated, as told in the Sthalapurāṇa or local

history. The presence of persons from adjacent villages was often the name itself was taken down in the vernacular from the spot in the handwriting of a resident who could identify the headman (Maniyakāran), the chief village official (Munsif), or the village accountant (Kanakappillai). I prefaced the list of place-names with a few general remarks upon the results I have arrived at, and have appended a tabular statement of the characteristic adjuncts of the names. This is followed by some notes on the

Finally I have added a classified list of the comparative adjuncts to the proper names of places with in the Tamil country, with their significance have been able to learn it.

From an inspection of the maps of the district and of place-names here given, the following facts may be

I.—TOPOGRAPHY.

- (1.) That the delta has many rivers and canals, by Irrigation. of the following adjuncts meanin.
&c. :—ār or āru, kāl, kaṇṇi, vāyl
- (2.) That it is highly cultivated with rice fields, ga and plantations, by the follo
Cultivation. kollai, marudūr, nellūr, pulam,
tōṭṭam, vanam, vayal, vēli.
- (3.) That the country is low and flat, especially Country flat. sea, by the frequency of the
karai, kōṭṭagam, kuḷi, madug
pallam, paravai, vayal, veli.
- (4.) That there are no hills, mounds, or rocks, as si
general absence of names signifying
achalam, giri, kuṇ(d)ru, malai, &
kal, karaḍu, kunnam, mēḍu, pārai,
teḍal, tittu, &c.
- Absence of hills
and of mounds and
rocks.

² For the significations see pp. 87, 92.

There is a remarkable absence of tanks and reservoirs in the deltaic portion of the country, these being generally quite unnecessary for irrigation on account of the numerous river channels and canals. This is shown by the absence of names meaning tank, reservoir, &c.:—*ēṇḍal*, *ēri*, *um*, *kuṭṭai*, *samudram*, *taḍāgam*, *tāṅgal*, *ūruṇi*. Many tanks in the towns, but few places are named

II.—POPULATION AND RELIGION.

presence and preponderance of Brahman influence in
 va- the best part of the district is shown by the
 following adjuncts :—*egaram, agrāram, aiyan,*
maṅgalam, pāppān, Perumāi, puram, svāmi, Tiru.
 miliar Brahmanical proper names :—

i, *Harischandranadi*, *Gōpālpuram*, *Kalyānapuram*, *Kistnāpuram*, (for *Krishnapuram*), *Kuttālām*, *Mahādevi-pattanam*, *Mahālingam*, *Pāpanāsam* (or *Pāvavināsi*), *Perumāl*, *Pushpavanam*, *Raghunāthā-mī*, *Rāmēśvaram* (also called *Tiruva Rāmēśvaram*), *am*, *Somēśvarapuram*, *Śrīraṅgam*, *Tenkāsi*, *irupūvanam*, *Vēdāranyam*, many of which are to be most fertile parts of Southern India, in the great nd deltas where the chief Brahman communities nevelly and Madura, on the rivers *Tāmraparṇi* ell as on the *Kāvēri*.

ell as on the Kāvēri.
 or of cow-names seem to point to a prevalence of
 a "cowcult;" a few of these are as follows:—
 Ātalaiyūr, Āvūr, Gōpālsamudram,¹ Kōmal
¹ Kōvūr, Paṭṭiśvaran, (and ? Kōnūr).²
 of the former prevalence of tree and serper
 worship is to be found in a remarkable grou
 of Nāga names, which runs in a line fro
 Nāgūr and Nāgapattanam ("Nagore" ar

should also be referred to Krishna, who is worshipped as

Negapatam") on the coast as far inland as Nāgapattānam has only recently lost a last Budd relic, in the removal by French Jesuits of the "Jain Pagoda."

(4.) The serpent names are as follows :—Nāga
Serpent names. Nāgalūr,⁴ Nāgalpūṇḍi,⁴ Nāgam
Nāganāthasāmi, Nāganti, N
Nāgarasapuram, Nāgattūr, Nāgēsivaram, and Nāg
Pāmani, Pāmbanōḍai, and Pannateru.

(5.) The sacred tree names are :—*Alanguḷi*, *Ā*
Sacred tree *Atti*-, *Atti*, *Kaḍambūr*, *Tolaśaipu*
names. *paṭṭu*, *Vēmbuḡuḷi*, and *Vilvanūr*,

(6.) The religion of the masses of the people is
Local religion. following :—*Aiyanār*, *Amman*,
Kāṭṭēri, *Māri*, *Nāga*, *Perumāl*,
yār, *Śāttan*, *Śivan* ; but there is an apparent abser
(Pēy) worship that is common amongst the lower
south, the *Śāṇārs* for instance. *Asura*, *Rākshasa*,
been banished by a higher civilization.

III.—COMMON PLACE-NAMES.

(7.) The village names of common folk are
Common village Tanjore, but are much the same
names. adjacent districts, the common
Kuḍi, *Paṭṭu*, *Pēṭṭai*, *ūr*, *veli*, &c.

(8.) The preponderance of an agricultura
Absence of the population is shown by the a
military classes. (Fort) and *Paḷayam* (Fief),
or chiefly found outside the delta.

Nāyakkan and *Rāja* names are scarce but *Araśe*

(9.) The absence of wild aboriginal and pas
Absence of wild shown by the absence of the
tribes. common in the adjacent provin
Idaiyan, *Kaḍaiyan*. *Kuṟumban*, *Kuṟavan*, *Oṭṭa*
Paravan, *Valaiyan*, *Vēḍan*, &c.

⁴ These names may perhaps be traced to the Tamil *Nāṅgal*, a

PLACES IN TANJORE.

Anai-kottam ..	..	{ 'Anacottum' of A.S. 79. Kottam = The cattle-sheds at the bund.
Anḡarayanallūr ..	..	{ Anḡaraya's Nallūr = 'good-ville.' Anḡa loor of A.S. 79.
Annavaśal ..	..	{ 'Food-port'; anna boiled rice, and vaśal; way, entrance, or port; a place where f distributed in charity; often named anna-ch and anna-salai; also annakuppam.
Ara-kattalai ..	..	{ 'charitable endowment,' from aṛam = c and kattalai a grant, order.
Araśalar ..	..	{ Arasilaiyar; the large river channel Kaveri, close to Kumbakonam on the S. si
Araśa-paṭṭu ..	..	{ 'Royal place'; or Pipal village, from A Pipal or Royal tree: cf. Tel. Rayichet' mānu.
Araśūr ..	..	{ = 'Kingston.' This is another Royal Mannārguḍi 10 miles S.W. o to distinguish it from Mannārgu doody' of A.S. 79), a few miles other two places called Mannārgu are distinguished as Raja-Mannārg Mannārguḍi, or Royal and Wild M.
Ārkāḍ or Ārukaḍu, Anglice Arcot ..	..	{ = Six forests (poet. Saṭaraniyan of six Rishis in old times. Thei places of this name in Tanjore and besides the town of 'Arcot' ne (Ārkar. ū Baṣṭheior Zāpa). One of correspond better than that with Hark. Batuta who reached it the first evenin march inland after landing from Ceylon rently on the shallow coast of Madura or (fourteenth century).
Arittuvārimaṅgalam ..	..	{ arittu = 'green,' and vāri a water-cou 'Aratavaramaṅgalam' of A.S. 79.
Āruśutti-paṭṭu ..	..	{ The 'Acherdupat' of A.S. 79. It m River-embraced paṭṭu (but Āruśutti is al amongst the Kallar tribe).
Āttanūr and Āttūr ..	..	{ 'River-village.' Āttūr is a common fr āru a river, which becomes ātt- or ātr- in tion as in Āttārguḍi = River-hamlet, an karai = River-bank. Āttūr in Mayavāri has also a Sanskrit name, Nadipura = Riv
Avuḷivainallūr ..	..	{ 'It is she'-Nallūr. A legend to acc. this name is told of a man hesitating to ac espoused bride until supernaturally inform she was the right person.
Āvūr ..	..	{ 'Cow-ville,' a decayed town 5 miles Kumbakonam with a temple and a long about a cow (ā). May not this be the Ābur of the map of Ancient India in Classical Atlas? Colonel Yule suggests A but this Āvūr seems nearer, and if not th are several places in South Arcot named.

ON THE NAMES OF

PLACES IN TANJORE.

adi	{ Aiyangar's (<i>Ayengar's</i>) abode. Vaishnava Brah- mans are called Ayyangar (prop. Aiyangar), whereas Saiva Brahmanas are called Ayyar (prop. Aiyar). Aiyar = Father, elder, preceptor, &c.
adi	{ Pastor's enclosure, or garden. Ayan a herds- man, <i>Cow-keeper</i> , ? from a a cow.
or-bakkam ..	{ (in combination) for pakkam (cf. pakkam, a side = Sax. 'bord' Eng. (<i>sea</i>) <i>board</i> ; a common affix to places in the seaboard districts near to, and south of, Madras. Cf. S. bhaga a share, lot, division, also H. bagam a cultivated place (? Per. bagh). See Pakkam.
giri (Bhuvana- ambaram.	{ name of a town on the Vellar river, near Chid- ambaram.
ore cor- ur.	{ There are several places of this name in Tanjore and in other parts of S. India; ? = 'Worship town,' from pusal adorning an idol in worship; pusi to offer (pu) flowers; pūchu Tam. = anointing cf. Hind. pūja = worship (Tam. pusal = battle). Pūdanūr is common and seems to be another form of this name. The Tam. pūsa means daub, smear, anoint, adorn.
.. ..	{ See Kallimēdu.
.. ..	{ properly Karaikkal, the French Coast Town between Tranquebar and Negapatam. There are several places with the prefix Karai on the S. India coasts; Karaikōttai, Karai-kurichi; Karai- kal might mean 'Masonry (chumam) channel.' One of the Chōla princes was named Karikala.
vappār ..	{ Shaggy lord, Lord matted-locks; an epithet of Siva.
baram or umbrum.	{ Anglo-Indian usage for Chidambaram, q.v. Natives also miscall it <i>Sittambala</i> .
! (u) .. Aankuḍi ..	{ 'Red wold,' 'Bloody field,' a common name in the Tamil country; applied to a place sacred to Siva: from se, sen, red, and kaḍu forest, grove, &c. This god loves the color red (? Sanguis).
.. ..	{ The <i>Shory</i> of A.S. 79 which also has another, <i>Shorey</i> ; cheri (°) means a village, street, hamlet, &c., from a root meaning <i>collection, assemblage</i> , &c.
baram ..	{ The town between the Vellar and Kolladam (<i>Coleroon</i>) rivers, with the famous ancient temple of Siva, commonly called by the English ' <i>Chellum- brum</i> fr. chit = wisdom, and ambara horizon, sky; = <i>Heaven of wisdom</i> . Tillai, or Tillaivanam is the former name of this place, and it is familiarly known as Tillai even now amongst the natives. ? May not this be the ancient Theilyr and? ? <i>Chelap</i> of Ptolemy and the ancient geographers. But perhaps Tellūr (near Vandavasi) may be it.

Chēpattur ..

Chōlattaram ..

Devanapattanam ..
"Tevenapatam"
"Tegnapatam"
"Thevanapatam"

Devanūr ..

Dēvikōttai ..

Divukōttai ..

eri ..

Erumai-paḍugai ..

Ervādi ..

Gandarakōttai ..

Fr. Si for Sans. Sri *holy*, and pili c
a tiger. There is a legend of a tiger havin
worship to the deity (Siva) here. Vyāghra
'Tigerfooted' is the name of the origina
of Chidambaram.

The '*Themet Solatrum*' of A.S. 79 =
land; taram may be for tarai land, or sho.
from Sthalam a place, station; thus Tam. tar
talam = sthalam. The initial S is very
dropped, as in thāna for sthāna, and
othōra. Cf. Lat. tellus and terra. The 'T'
is unexpected unless it be for Ten-chōl
= Southern-Chōl. It is south
Vellar river and signs of
having existed in the ..

The name of ..
"Cuddalore," is perha
names of this place. The ..
great seaport town having for ..
this place called Devanapattanam or De
for Devanayagan-pattanam.

'Godaton.' Tevan is a common title
the Maravar tribe, and is frequently ass
the Rajahs, Nayaks, and Poligars of Sou

At mouth of Kolladām river, ? a mis
Divu or Tivukōttai, but there is Dēvipattai
the coast, and Chōlamādēvi inland.

'Isle fort.' Divu or tivu is the Tamil
of the Sans. dvipa an island (dvi + ap two w
cf. do-ab, land between two rivers); this
indicates a delta formation at the mouth
Kolladam river.

a big irrigation tank, or reservoir; a
water; a common affix; erpu = ascen.
a ladder; enthal = highness, &c. also appl.
tank, same as tāngai a pond, or tank fr.
support, bear up, &c. Also cf. erru (°
raise, lift, and erram (vulg. yettam);
lift = Tel. etamu; and ettu = lift, heig
Kan. eri a tank bund, fr. eru ascend, rise
er = plough (Lat. arare to plough, r
tillage), ? because it raises the soil, Gr. a
(Gr. *alpu* = I raise, lift up, bear, &c., Lat.
ire. Eri = water retained at a high level.

'Buffalo flat.' The '*Arumapudda*' c
79 from Erumai a buffalo, and paḍugai,
lying tract near a river or tank, where th
are collected after grazing.

? 'cattle pen' or "dungyard;" fr. er
(cf. erumai = buffalo), or eru manure, co
and vādi enclosure, yard.

for Gandharva Kōttai. The Gandhar
demigods, celestial bards, who defea
Nagas, q.v. The name of a small estate of
Zamindār, S. of Tanjore, in the vicinit
numerous Naga places mentioned.

* Chēri = Kēri; perhaps Sanskrit Kshetra or Khetra. - G.O.

ON THE NAMES OF

i-konḍa-chōla-	..	{ = City of Gaṅgai-konḍa chōla, now called Gaṅgai-konḍapuram 'Water got town.' A decayed place with a grand old Siva temple, going to ruin. It is like the Great Temple at Tanjore, perhaps grander; is said to have been the capital of a Chōla king? Gaṅgakonḍa Chōla.
-samudram	..	{ = Cowherd's lake.—The name Cōpāl occurs several times. See Samuttiram.
ṅuḍi	..	{ one of a cluster of cow-names, near Āvūr (cow town). An explanation offered at the place was that a sacred cow (gō) strayed there (vanda = came); but the name Gōvind occurs again once or twice in the district.
...	..	{ 'Cuddalore' of the English residents. Kūḍalār means 'Meeting town,' being at the confluence of the Gēḍilam or Gadilam and Paravanār rivers with each other and the sea. It is a common name in S. India; there are several in Tanjore of less note. Kūḍal, or Kūḍali, is a common name for a town at the confluence of two rivers: as for instance Kūḍalai-attūr, at the junction of the Maṇimuktār with the Vellar.
lu	..	{ Iḷaiya, Iḷa = young, and Kaḍu = wood, jungle: several instances. Sans. name Bāḷavanam, both mean 'young wood.' The Government official name of one is Rājagiri, but there are several.
riyāvattam	..	{ 'Encepeereavallam' of A.S. 79. See Vattam.
ollai	..	{ 'Green ginger field.'
..	..	{ a residence, abode, dwelling; a common suffix, as in Kuḍiyiruppu = dwelling house, habitation; a hamlet: from iru sit, be, remain.
onḍachōlapuram	..	{ 'Jahenkoodasolapuram' of A.S. 79. The town of Jayankonḍa-Chōla, a taluk town in N.E. Trichinopoly. There are some old Jaina images here: one called Paḷappār (Paḷhappār) still respected by a few Savanar folk.
iyankonḍachōla-	..	{ Kācha-hollow, or dale. The Kācha shrub, Memecylon tinctorium, grows wild freely in South India and fills the jungles. Kāchan-bakkam, K. kād, K. kottai, K. kurichi, &c. are common in South Arcot District and on the borders of Tanjore.
paḷlam..	..	{ = 'a bracelet,' 'ring,' another village is called Kappūr from Kappur a bangle.
um	..	{ From kaḍal the sea, several places so called from the sea having formerly reached them in a storm; though now some distance inland.
ṅuḍi	..	{ From Kaḍambu a flowering tree (f. Eugenia racemosa) sacred to the god Skanda.
ūr	..	{ A wilderness, jungle, untilled field, thicket, wild, forest: Arkkaḍu (Arcoi); as prefix Kaṭṭu, Kaṭṭu Mannāṅḍi, Kaḍuvettan, &c. (q.v.) Kaḍu is rare in the delta but common beyond. For deri-

PLACES IN TANJORE.

Kaḍu—(Continued).	..	{ vation compare kā a grove, as in Paṅka = garden, Tiruvānaika = saint elephant grove Trichinopoly; anc. Tam. and anc. Mal. kā forest, jungle; Koḍi-kānaḷ = creeper-wood (hills); kā also means a pole, beam, a kāvaḍi a shoulder pole, for carriers, (kahār Kan. (W. Mysore) kan = a wood, evergreen; and on Malabar coast kāvu or kāu = a sacred enclosure or grove: perhaps from Rt guard, whence kaval = watch, ward (Lat. Kaḍu is applied to a scattered collection of things; as, kuḍikkaḍu (grove of huts) a neruppukkaḍu a conflagration (a forest of Vellakkaḍu a general flood.
Kaḍuvettan kurichi	..	{ = ('Forest-cleared hamlet'). Vettu = strike, &c. See Kurichi. Kaḍuvetti was of one of the Chōla princes.
Kalañchēri	..	{ 'Threshing-floor-village.' Kalam = threshing floor, also a battle field. In the delta the threshing floor is the only dry be found in the irrigated parts very often usually the best site for a new hamlet.
Kalañjimeḍ	..	{ For Kalañji-meḍu = Mushroom-(or f mound.
Kallaṅkarai	..	{ 'Stony bank.' The name of an old bund or dyke some miles in length north of Kollaḍam.
Kalapalagaram	..	{ 'Cullapaulgurram' of A.S. 79, near Kur kōḷam. Cf. 'Gullapaul' near Tirutaraḷ see next.
Kalapālīśvaran	..	{ 'Kalapālīśperi' of A.S. 79 (see preceding) idol is said to be allotted a kalam measure of milk (pāl) daily.
Kallaṅpūṇḍi	..	{ 'Kallaṅ's Grove.' The Kallaṅs were a tribe of borderers between the Trichi Madura, and Tanjore Districts. Kallaṅ is Sans. with thief in Tamil (S. chala = frau clepo, κλέπτειν.)
Kallimeḍ	..	{ (Point 'Callimere') = Cactus (Euphorbia) mound; but none there now. It is common (locally) Koḍikarai = 'Point Shore.' It is to be the "Kalligicum" Promontory of geographers. Pliny gives Calington. It is times written and pronounced Kallimōḍ(u), Kallimōr, as in Nagari-mōr the Nagari Ne hill peak, near Madras). Rama is said to attempted to make a causeway hence into I (Ceylon), and the Rāmasami-padam-maṇḍ is said still to mark his footsteps (padam).
Kambaiyanattam	..	{ Kambaiyan is one of the many titles among the Kallaṅs; nattam = a settlement, village, plantation, from naḍu = plant, set.
Kanḍa or kaṇḍan	..	{ in combination in placenames means 'met with.' See Kaṇḍan.

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tan paṭṭu	..	See Paṭṭu.
yaṅ Kurichi	..	{ There are several places named Kaṅgaiyan. Kaṅgayam was one of the seats of the Chera Kingdom near Coimbatore. Kaṅgaiyam = gold.
nār	..	{ ? Kannan's (river)-channel. A watercourse S.S.E. of the delta.
..	..	{ A small channel for irrigation purposes, a canal channel; cf. Eng. kennel a channel. Sans. Khan = dig, excavate.
am	..	{ (on the Kāvēri) monkey place, from Sans. Kapi (Gr. κῆπος) an ape; and sthālam a station, place.
apatti	..	{ 'White-ant hamlet,' from Karaiyan white-ants; and patti a fold, a village of herdsmen. Karaiyan is a rather common prefix S. of the Kāvēri Delta.
ṭṭai	..	{ from Karai mortar, paste, cement ? = 'masonry fort.'
richi	..	{ ? 'Masonry hamlet.'
..	..	{ See 'Carikal.' The French town on the Coromandel coast (Chōramandalam) between Tranquebar and Negapatam; ? from Karai = masonry, and kal a channel; but there seems to have been a Chōla prince of this name.
ḍu	..	{ 'Shore mound,' from Karai a shore, bank, &c., and meḍu a mound.
pūr	..	{ or Karpūr, there are several places of this name in Tanjore; said to be so named from a legend of certain Rishi's wives having been seduced by Siva. Karu signifies pregnancy; also a magical preparation to fascinate or injure a person. Perhaps 'shrine town' from S. Garbha (Tam. Karuppam) a shrine, womb.
yammal	..	{ 'Musk-lady,' The name of a Tanjore Rajah's wife or mistress, to whom this place was granted. Grants made to courtesans are common; seven were mentioned on the road from Tanjore to Mannārgudi. Ammal = lady, mother, goddess.
..	..	{ pronounced and sometimes written kaṭṭalai, ? a grant. It ordinarily signifies an order, charge, appointment; a (brick) mould; but is commonly applied in Tanjore to a certain plot of land (? 'message'). 5 or 6 miles E. of Kumbhakōṇam there are, or once were, 7 places called Kaṭṭalai, distinguished as first, second, &c. Mūdal, Reḍḍan, Mūnan-, Nalan-, Aran-, and Eḷan-, or seventh kaṭṭalai assigned for the seven services of the great temple.
rinattam	..	{ 'Brinjāl plantation;' kattari the egg plant, Solanum melongena.
u-Mannārgudi	..	{ 'Jungle-Mannārgudi,' to distinguish it from Raja-Mannārgudi.

araiyan = a man of a shore-dwelling tribe; but these places are not on the coast.

(10.) The "Paṭṭanam," which was so frequent on the shore Palk's Bay to the south of Point Calim Coast names.

(Kaḷlimēḍ) has given way to Paṭṭanachēi and Paṭṭachēri or Paṭṭichēri, which is a very common name for a village on the coast of the Kāvēri delta for 40 or 50 miles to the north of Kaḷlimēḍ. On the north of the Kollaḍam the commonest name for a fishing village on the coast is -kuppam, which again is succeeded north of the Pālār by pākkaṁ.

IV.—PARTICULAR NAMES.

(11.) Names of historic interest or remarkable proper names that occur also in other places, besides those under former headings are: Būdalūr and Būdanūr (otherwise Pūtalūr and Pūta-), Chōlapuram, Kaṅgaiyan, Koṭṭakai, Mannārgudi, Musiri, Ūr, Ōriyūr (or Ūraiūr), Perambūr, Shōranūr, Talakāḍ, ṭṭūr, Tiruvellūr, Tuvaraṅkurichi and Vellūr.

..) A score or two of proper names given below were the proper found which appear to be those of ruling princes, mostly Chōla names, but a few

Nāyakkan and others occur:—
 uram (Nāyakkan), Ādivirāmapaṭṭanam, Ānanda-
 Chōlanpēṭṭai, Chōlapuram, Chōla Sudāmaniyār, Divu-
 (for Divikōṭṭai), Gaṅgaikōṇḍa, Gōpālasamudram, Gōpa-
 ram, Harischandranadi, Jayaṅkōṇḍachōlapuram, Kaḍu-
 Kalyāṇapuram, Kannānār, Kīrttimān, Koḍamūrṭti,
 vanāru, Koṅgarāyan (? Chōlan), Kuttanāru, Mannan-
 nār, Mannārgudi, Muḍikōṇḍanār, Narasingampēṭṭai,
 anvāykkāl (Chōlan), Pāṇḍuvaiyāru, Perumpāṇḍi, Pillai-
 kāl, Ponaikōṇḍan, Raghunātha Kāvēri, Raja Gōpālpuram,
 ndra, Raṅganāthapuram, Rāramuttiraiḱōṭṭai, Sevaganār,
 vanār, Tirumalairājan, Tirumalasamudram, Tirumala-
 l, Vennār, Vikramānār, Vināyakkan, Viramaṅgaḷam,
 sōlanār, Yaḍaiyār, Yaḍavagudi, Yānāthaṅgudi.

Orattūr (pronounced Oratthūru) is found repeatedly in this and the adjacent districts, and may represent the "Orthura" of ancient geographers, for which Colonel Yule's Map of Ancient India

res *Ureyūr*, and Professor Lassen's *Wadiūr*. *Paṭṭukōttai*, *id-paṭṭu* perhaps represent the ancient "Batae" of Yule's map; *paṭṭi* is very frequent also in the same neighbourhood. *Āraṇkarai* (pronounced now-a-days *Ātraṇkarai*) at the mouth of the *Vaigai* looks very like the ancient "*Argari*," and "*Sinus*

Ancient.	Modern.	<i>Argalicus</i> " (Yule), the Argaric Gulf.
Orthura.	Orattūr.	Ptolemy has (Ἀργειονπόλις) which may have been the "city of the Anai-karai," the causeway (Adam's bridge).
Batae.	Paṭṭu or Paṭṭi.	
Argari.	Āraṇkarai.	
Korula.	(Several).	
Arenbur.	Arambaūr.	
Saburas.	Sāvur.	Kurla or Koralai-gorla, &c., on the East Coast may represent the ancient Korula. There is " <i>Gorlapālem</i> " i Nizāmpaṭṭanam (cf. <i>Vingorla</i> , Sc Conkan, Malabar Coast).
Abur.	Āvūr.	
Thellyr.	{ Tillai.	
	{ Thalūr.	
	{ Tellūr several.	
Talara.	{ Tellar.	A marginal list is given.
	{ Tillarampaṭṭu.	

V.—NATURAL PRODUCTIONS.

The vegetable kingdom is well represented by the fr some of which recall the tree-worshipping propensiti followers of the Buddha:—

- (1.) Āl banyan, araśu pipal, atti fig, āvārai, avu
Flora. elumichai lemon, ieham date, ilavam
iñji ginger, kāchān, karumbu sv
kattiri eggplant, mā mango, mañjal turmeric. nāval,
nunna, pālai, panai palmyra, parutti cotton plant, piram
puḷi tamarind, tāmarai lotus, tennai cocoanut, tola
tuvarai lentil, vanni, vēlam thorn, vēmbu nīm-tree, viḷā
religiosa, vilvam Bēl, Bael.

- (2.) The animal kingdom is but scantily represented;
Fauna. the populous and cultivated delta ther
room or encouragement for any wild an
The only wild animals commonly noticed are monkeys, mor
rats, jackals, and lizards; these, with a few birds and
nearly complete the existing fauna, except the spotted de
antelope, only found near Point Calimere on the coast
following were, however, found in the place-names:—

urai	...	...	{ 'Audathoray' of A.S. 79 = 'Sheep-ford,' at the passage of the two river-channels 8 miles N.E. of Kumbhakōpam, from adu sheep, and turai (q.v.) a ford, passage or resort.
ram ^s or Akaram	..	..	{ A common form of agraḥāram in Tanjore, which the Tamils cannot pronounce properly; a street, or village, of Brahmans; also a dwelling, mansion, place.
raputtūr	..	..	Agra-pudu-ūr = chief-new-town.
saveli	..	..	{ Fr. Āgasam, the sky, air, and veli the air, the open (= the open air), a plain, desert.
ram	..	..	{ For S. agraḥāram, a royal gift of land to Brah- mans; a Brahman village or street. Having no aspirate the Tamil form is akkirakaram.
rattūr	..	..	{ Prime Attūr; attūr is a frequent place-name in S.E. India, commonly applied to a village by a river ar or aru; in combination as becomes att as Attāṇkarai = river side.
guḍi	..	..	{ 'Banyan-habitation;' al the <i>Ficus Indica</i> or <i>Bengalensis</i> , and kuḍi a dwelling. This is one of the commonest place-names in Tanjore. Brahmans derive the name from alam the deadly poison which arose at the mythical churning of the milk- ocean and was swallowed by Siva. The Tamil poet Kālamēghan in a complimentary verse on the Alāṅguḍi Temple styles Siva Alāṅkudiyan = 'poison-drinker.'
iguḍi	..	..	{ ? 'Gift-hamlet,' Sans. name Upadanapura. The land was a gratuitous endowment for a Siva Temple built by a Chōla prince.
ār	..	..	{ Banyan (tree) village. The alai-maram is the <i>Ficus Indica</i> or <i>f. Bengalensis</i> . See Alāṅguḍi.
veli	..	..	{ From alam a salt field or marsh, and veli means a wall, hedge, a certain quantity (about 5 acres) of land; with alam, salt, &c., compare Gr. ἅλς the salt sea, sal = salt, and alum.
aravatham	..	..	{ Vulgar usage for Amarakam, or more fully Amarakagatteruvu, a small village street, or hamlet near Mannārguḍi.
alapaṭṭu	..	..	{ ? from ambal = lotus, and paṭṭu (q.v.) a place.
naṅguḍi	..	..	{ 'goddess-abode' = Hind. Devighar.
maṭṭai	..	..	{ a town and railway station 10 miles E. of Tan- jore; said to have been formerly called Ammal- patthu = 'Lady-ville,' or Amma-kōvil-pattu = Goddess-Churchtown. It is the Ammapatta of A.S. 79. This patthu being for parṭu = patt(r)u a parish. Paṭṭai means bazaar, market, &c.
	..	..	{ = 'Weir-bank;' a common term in the S. dis- tricts for an apaikat (Anglice) anicut: apai = an artificial bank, dam, bund; karai = a (natural) bank, shore.

perhaps connected with Sanskrit *ajira*, *ager*, or even with *nagara*.—G.O.

PLACES IN TANJORE.

A cow, āḍu sheep, ānai elephant, erumai buffalo, monkey, karaiyān whiteant, kō cow, kokku crane, mān mayil peacock, nāg snake, nari, fox or jackal, puli tiger, pūnai cat.

(3.) The chief fact learnt from a cursory study of the topography of the Kāvēri delta appears to be

Conclusion. universal influence of Brahmanical civilization upon an industrious agricultural population of indigenous origin.

Śiva worship seems to be the religion of the majority, there is a very large admixture of demonolatrous superstition.

Īśvara (in combination -ēśvar) so common in South Indian place-names is the same as, and the common name for, Śiva, is usually found in the names of his temples, or those of presiding deities in whose form or under whose name he is worshipped.

TANJORE PLACE-NAMES.

Place-names met with mostly in the Kāvēri Delta and Tanjore District.

Achuthapuram	{ A second name of Sāliamaṅgalam, after Athappa Nāyaka (king) of Tanjore.
Adaiyar	{ 'Choked river.' Fr. adai to be choked, as by sand: cf. The 'Adyar' River, Madras; adaippu, obstruction.
Ativirāmapaṭṭanam on the Argaric Gulf.	{ 'Adrapaṭam' of Ind. Atlas Sheet No. 1. Ati-Vira-Rāma's town, or seaport town; Vira-Rāma (Great-Hero-Rāma) one of the Pandiyan princes of Madura; situate at the of Palk's Bay, the Argaric gulf (Sinus Argaricus) so named perhaps from Atrankarai (arrank the Ἀτρεϊκῆς of Ptolemy, at the mouth of the Vaigai river. Ἀτρεϊκῆς however looks like Atrankarai, the ancient name of Adam's Bridge called by the Tamils as being the bridge causeway par excellence. The early Arab voyagers called it (and the country beyond and about Ma'abar which in Arabic signifies ferry passage = "The Straits" as we show) the middle ages, before Pāmban was separated the main land by the storm that broke the famous causeway, there is said to have been a city, remains of which are still to be seen. Spit of sand opposite to Pāmban.

PLACES IN TANJORE.

Kāvēri	{ The 'Cauvery' River, the most sacred river of Southern India; from Tam. Kavi Red-ochre, and a sheet of water: cf. Tel. eru a river; = 'red river'; otherwise 'Wood-water' from Kavu a grove. It is also named Kāka nadi, ? Crow-stream, from a fable of a crow (kāka) having upset the water jar of the Rishi, Agastya Muni; and this recalls Kumbha-kōṣam = 'Jar brim,' which may have reference to this fable. Another story makes it Saint Kāvēri, daughter of Kāvēra Muni, who was allowed to become a holy river in order to do good to men; all perhaps mere priests' inventions, to enhance the sanctity of the river and their own importance. (See next.)
Kāvēri-paṭṭanam "Cauvareypaṭam or Keelaur" of A.S. 79.	{ 'Chaberis Emporium' of Ptolemy. The port at the river mouth has also been named Kāvēri-paṭṭanam, ? for K. -pogum-paṭm. = 'Kāvēri-passagetown.' The three great islands in this river are all named after Vishnu, viz., Śrīraṅgam at Trichinopoly; Madhya-Rāṅga, now commonly called Sivasamudram between the two great Cauvery water-falls, and Śrīraṅgapaṭṭana (Seringapatam) in Mysore. Kīlār = East-bourne; 2,000 years ago this may have been the principal mouth of the river; now there is scarcely any channel at all.
Kirttiman	{ The name of one of the great river-channels of Tanjore, so named perhaps from some prince's title kirti = fame, glory, &c., and man a prince, &c. Cf. Cheraman, Toṇḍaman.
Kivalār .. ..	.....
Koḍaivaśāl	{ 'Bounty-port,' 'Charity-place' like Annavaśāl: koḍu = give.
Koḍali-karupputr	{ On the north of the Kollāḍam.
Koḍamaṅgalam	{ (Compare Koḍaivaśāl) ? = Charity-maṅgalam.
Koḍaṇḍavilāgam	{ 'Battle field of the bow.' Koḍanda Sans. a bow, arc, &c., from Sans. root kuṭ to be bent, crooked. Vilāgam is a rather common affix in Tanjore. Vilasam = sport, dalliance.
Koḷḷaḍam or Kollīḍam	{ The 'Coleroon' River, being the northern arm of the Kāvēri river running along the N. edge of the delta; the derivation given is Kol-iḍam or Kolai-y-iḍam = 'slaughter-place,' from a legend that men were sacrificed or cast into a breach in the river bank in order to stop it; but compare also kollai a breach in a bank (Gundert).
Kollai	{ A 'close,' an enclosed field, garden or yard; a 'craft,' applied in Tanjore to the enclosed fields that cannot usually be irrigated, but have a fence or hedge: cf. kōl a rod, or stick. Compare the derivation of yard, vallum, town, &c.
Kōmal	{ In Māyavaram Taluk. A cow-sacrifice made by Rishis here, they say.

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Konḍan	{ In combination = <i>met</i> , obtained; also applied to a channel, e.g., Uyyakonḍan, at Trichinopoly? It is also found in titles of princes, and means <i>Wearer</i> (?)
Kōnūr	{ 'Kingsville.' Kō, or Kōn, is ancient Tam. for a king: cf. (Pers. Khān). Kōn is a title amongst the Idaiyan or Herdsman tribes.
Koraḍachēri .. ..	....
Kōraiṃ	{ <i>Reed-river</i> : kōrai, reed, coarse grass. Several river channels of this name.
Koṟukkai	{ (Near Māyavaram) stated to mean 'short arm,' referring to an image of Pillaiṃ <i>The honorable son</i> (of Siva,) with short arms;? Kuruku = short. Kōrkai in Tinnevely, Dr. Caldwell derives from kol = slaughter, and kai = hand, and gives kōrkai as the modern form of the old Tamil kol-kai, a poetic word for an <i>army</i> or <i>camp</i> ; from this place the Greeks named the gulf of Manār the "Colchic" gulf.
Kōṭṭagam	{ A tank, pond, &c., also a temple; same as kōṭṭam a place, an agricultural district, &c., applied to the <i>meres</i> or waste-water lakes in E. Tanjore.
Kōvalam	{ A cape, headland, or a town so situate. It is found on the coast, e.g., 'Covelong' south of Madras, and elsewhere. "Kōvalam" near Cape Comorin.
Kōvilan tōppu	{ 'Kōvilan's Tōpe' (<i>Churchman's clump</i>). Kōvil a temple, tōppu = Sans. stūpa a mound, clump; the initial S dropped, as in talam for stala, tan for stāna, &c.
Kōvilpattu	{ = 'The 10 <i>vēli</i> of land belonging to the Temple; (the 'Coilpath' frequent on A.S. 79) applied to a temple, village, or a place belonging to a temple; pattu usually means ten (10), can it mean <i>tithe</i> here? Paru or patt(r)u a parish, from paru = <i>grasp</i> , adherence, attachment, &c.
Kōvindaguḍi	{ A tamilized name of a brahman village near Kumbakōṇam; there is a local legend accounting for the name as of Tamil origin, and not from the Hindu proper name Gōvind 'The cow finder.'
Kuchūr	{ 'Cot-ville,' from kūchu a hut, a cottage of leaves, &c., connected with kūchu for kurchu = 'point or peak.' See Kuppam and Kurichi.
Kūḍalai-Āttūr	{ <i>River-town at the confluence</i> . Kūḍal signifies a meeting, junction; see next.
Kūḍalūr	{ The place of meeting, junction, assembling, collection, &c., commonly applied to a confluence; e.g., Bavani-kūḍal; Kūḍali (of Kistna and Tumbhadra). It is common elsewhere, applied to any place of meeting.
Kuḍikkaḍu	{ A hamlet; an outlying hamlet: scattered huts = 'The cottages.' See Kāḍu.

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Kuḍitaṅgi	{ A village on the edge of the Kollāḍam river bank; 'Koduthany' of A.S. 79; the field nearest to the supply channel is called Kuḍitaṅgi.
-kūḷi and -kuri	{ A pit, hole, hollow, dell. Tōrakkuḷi = <i>Herd-hollow</i> ; Kuppankūḷi = <i>Cottage dell</i> .
Kulichapaṭṭu .. ..	....
Kumbhakōṇam *	{ Former capital of Tanjore and seat of a Chōla dynasty, but now of brahman wealth and culture. The derivation commonly given is Sans. kum-bha = a <i>water pot</i> , and kōṇa = corner, edge; <i>brim</i> ; with kumbha compare Gr. κύβη a hollow, Lat. cymba a vessel, Eng. coomb. fr. Sax. cumb, a vessel to measure with; may not this name have some connection with the legend that Kāvēri originated in the upsetting of the Rishi Agastya Muni's waterpot by a crow, and its water flowing thus far: Kumbakōṇam having been built near the extremity of the Kāvēri floods?
Kumbhēśvaran	{ 'Lord of the water pot' = Kumbha-īśvara; deity of the Śaiva temple at Kumbhakōṇam.
Kumulankāḍu	{ (the 'Clamungcaadu' of A.S. 79)? Kaliman-kaḍu = 'Clay jungle.' Āḷaḍi-kumulai was met to the southward.
Kuṇavāsai	{ See Annavāsai and Koḍavāsai.
Kuṇḍūr	{ Kuṇḍu a (cannon) ball. A shot fired from the great gun on the E. or N.E. ramparts of Tanjore is said to have reached this village 4 miles off, and a masonry mark is still shown, and said to denote the spot. Cf. the Guṇḍu Gramam, "cannon ball villages" at Cuddalore.
Kuṇjuveli	{ A new name for Nāgappa Nallūr in N.E. Trinopolis. See Veli.
Kunnam	{ ? perhaps for kuṇḍam, a hillock, &c., common in S. and N. Arcot Districts.
Kuppam	{ a hamlet or suburb, of poor people or low-caste folk, such as fishermen, &c., made of <i>thatched</i> huts or 'peaked' cabins. The root meaning seems to be, <i>heap, group, collection, pile</i> , &c., generally of refuse. This name is hardly to be found south of the Kollāḍam and Kāvēri. Its home is the valley of the S. Pennar, and between the Palar and Vellar rivers in S. Arcot, but it extends on the coast between Pulicat and Point Calimere, and inland from Cuddalore as far as the E. Ghats. The group of <i>pointed roofs</i> is the chief feature: Cf. koppu and Gōpuram, a pointed roof, spire. Kan. kop, kōppalu, a suburb, a cluster of pointed thatched huts; Tam. kuppai and kuppai a heap, collection, stack, dunghill, &c., &c. The root kab, kap, kop, kup, &c., is found with allied meaning in many languages.
Kuppankūḷi	{ <i>Cottage dell</i> .

* The right for n is Kumbhaghōṇa, its ancient traditions are contained in the Kumbhaghōṇamahātmya. — G.O.

- Kurichimalai** { kurichi means a little village or hamlet, usually in a wild place; kun(d)rachi has been suggested as a fuller form of the word, as if from kun(d)ru a hill; but compare kuru = short, Fr. court, Lat. curtus, Per. and Hind. Khurd. Sans. kshudra, low, mean; Gr. *kuptós*; also kūrai = a pointed roof. See Kuppam and Kuchūr.
- Kuttalam** { There are several places of this name in E. Tanjore ('Cutaulum' and 'Kourtallam' of A.S. 79) and the well known 'Courtallam,' in Tinnevely; other instances of names common to Tanjore and Tinnevely are Papanāsam, Tehkāsi, &c.
- Lalpettai** { a decayed town named after Lal-Khān of Palaiyam-kōttai between the Trichinopoly and South Arcot Districts.
- Mailam** { Near Tindivanam, South Arcot, for Mayilam which is said to be a corruption of Mayarastalam Peacock's place. See Mayavaram.
- { A Śaiva temple on a low hill near the Mailam ("Mylam") railway station, South Indian Railway, said to have been built by Jayamba, or Jayambaga Maharajah, from the north.
- Malai** { A hill or mountain; although Tanjore is quite flat, except for the river channels and a few low sand mounds, yet many places have this affix, e.g., Swami-malai, which Dr. Burnell is inclined to identify as the Malakuta of Houen Tsang.
- Malaiyanattam**
- Maṇakkollai** { 'Sand field.' Maṇal = sand: a common prefix.
- Maṇakkunḍu** { 'Sand hill.' See Man-malai below, and Malai above.
- Maṇalmeḍu** { 'Sand mound.'
- Maṇikam kollai** { Maṇikam's field.
- Mannarguḍi** { Prince's abode, from mannan or manavan, a king, prince; (Mannar also means enemies, foes). There are several places of this name.
- Mannanpuñjaitōppu** { Commonly called 'Mannamiñjai tōp;' mannan, a king, prince, and punchey dry (inferior) land.
- Manmalai** { (See Manakkunḍu) earth hill, or sand hill: maṇ = earth, maṇal = sand.
- Mappillai Nāyyakkan-paṭṭi.** { There are no people called Mappillai (Angl. *Moplah*) in Tanjore; mappillai means son-in-law.
- Mappillai kuppam** { (In the Nannilam Taluk), there is a legend at Tiruchengattankuḍi ('Saint-Red-wold's dwelling'), that Śiva visited a Śaiva devotee in the guise of a hungry ascetic, and refused to eat any food except the flesh of his only son, who was accordingly killed and offered. An annual commemoration is still held, when a child made up of flour (ma) is sacrificed and offered to Śiva. The cost of this festival is defrayed from time immemorial by the villagers of Ma(p)pillai kuppam; pillai = a child, and . upkam a hamlet.

Maruḍūr	{ (Or maruthūr) this is a common place-name in Tanjore, and is perhaps derived from marutham = agricultural land; marutham or maruthaimaram also means a tree (? Terminalia alata), under which the village god stands. Maru = fragrance.
Marahgūr	Occurs more than once.
Mayavaram	{ More properly Mayāram (for Mayūra-puram) = Peacock-town. The natives call it Mayavaram, and the English Mayaveram. Mayūra (modern H. mōr,) = Tam. mayil, Kan. Navul, all from the peafowl's cry. See Mailam.
Melai-Kaḍambūr Mēlaiyūr.	{ West Kaḍambūr (q.v.) The kaḍamba tree is sacred to Skanda. 'Weston': mēlai = upper = western, as the country rises to the west.
Meykankollainattam ..	'Meykan's-field nattam'; M's upland village.
Mottai-kollai	{ 'Mound field' from the sandy ridge in it; from mēdu, pronounced mōḍu = rising ground.
Mottaiyan teḍal	{ Mottaiyan's (? Bald-head's) mound: an old village site, also called Tīrumanamaṅgalam: teḍal, tiḍar, tiṭṭai = a mound, bank, platform.
Mummudiśōlaṅṅur ..	{ (The Momotiśolum of A.S. 79) ? 'Three crowned Chōlan.' Mummudiśōlapuram to the southward is called Muppaiyūr and Mupptr.
Murttiyammāl	{ So named after the wife or mistress of a raja. See Kastūriyammāl.
Mūrttiyan	Mūrtti = body, form (of deity) = Image, idol.
Musiri ? Musiri	{ There are several instances of this name (? musu = ape).
Muttammālpuram ..	{ Named after the wife or mistress of a raja. Kastūriyammāl; (Muttu a pearl) Pearl-lady. Lady Margaret's Town.
Muttuvāñchēri	{ (Mootooveñchairy of A.S. 79) ? Muttuvār's village.
Mūvalūr	{ (Mayavaram taluk) Triś (or Trinity) town. Brahma, Vishnu, and Rudra performed service to the supreme (Śiva) here; see = three; see Tiruvalūr.
Mūvanallūr	{ ? May have some connection with mū, mūḍru = three; see next.
Mūvarakōttai	{ 'Trinity-fort,' see Mūvalūr; mūvar = three persons: it is vulgarly called Mūvarattai, or 'Mūvattai.'
Nachiyar-Kōvil	{ ? 'The honourable lady's temple.'
Naḍar	{ 'Middle river.' This village is on the Veṭṭar (= 'dug-channel'), between the Vennar and the Kōdamūrtti, river irrigation channels; see next.
Naḍu-paṭṭi	{ = 'middle fold.' naḍu = middle, centre, and paṭṭi a hamlet.

- Naga** The cobra; a *snake* (Ang.-Sax. *snaca*). There is a cluster of Naga or serpent names in Tanjore running inland from Nagapattanam and Nagūr on the coast, as far as Trichinopoly. They are Nāgai, Nāgakkūdi, Nāgalpundi, Nāgalūr, Nāga-maṅgalam Nāganāthasami, Nāganti, Nāgapattānam, Nāgarasapuram, Nāgattūr, Nāgēśvaram, Nāgūr (bis.); also Pāmani, Pāmbanōdai and Pannatern in the same neighbourhood. For the root compare Lat. *anguis* (? *nagvus*) from the Sans. root *ak* or *ank* to move *tortuously*, *aṅga* a *curved* body, a limb, whence *angulus* (cf. *annulus*) and Gr. *ἄγχιλος* an eel, &c., &c. Eng. *snake* fr. Sax. (s) *naca*.
- Nallaram** Nalla = good; perhaps for Nannilam, q.v.
- Nallavanniyankudikka-
ḍu** A caste name or title of a small Tamil tribe; kudikkaḍu = cottages, a hamlet. See Kaḍu.
- Nallūr** Good-town; a very common name, usually suffixed.
- Nannilam** 'Good soil,' from nalla = good, and nilam = ground, earth; nal becomes nan in combination, e.g., *nañjei* = good (rice) field; name of a taluk.
- Nattam** A village, or village site; the land reserved for building ground and gardens, &c., usually above irrigation level, and therefore = dry ground, applied especially to the villages of common peasants; in South Tanjore Kallar (s).
- Nattamalai** ? The village mound.
- Nayinipiriyan** For Nayakani-piriya = 'Lord and lady inseparable'; both god and goddess are lodged in one temple together.
- Neppu kovil** ? 'Fire temple' Neppu for Neruppu = fire.
- Neykumnam** This name occurs frequently north of the Kolladam river.
- Neykuppei** Ney is often met in other combinations, and has many meanings, e.g., grease, 'ghee,' blood, &c.; fat, rich (land). But they may stand for *nesavu* = *weaving*. Weavers form a considerable part of the population.
- Neyvanai**
- Neyvaṣai**
- Niḍamaṅgalam**
- Niraḍamaṅgalam**
- Odai** In Tanjore a reservoir, tank. In Madura and on the South Coast Odai is more commonly applied to a watercourse: fr. *Oḍu* = run.
- Okkūr** Several places of this name.
- Orattūr** ? the 'Orithura' of Yule's Map of Ancient India.
- Oriyūr** Several places with these names, Ūraiyr = "City of habitation."
- Oruttanāḍ Chattram** for Oruttarai-nāḍiya = *Sole proprietor's* chattram. This is the name of a country house of the late Rajah (Sarboji) 14 miles (S.E. of Tanjore. The Natives commonly call it Varttanāḍ chattram and the English "Rajah's Choultry" (chāvāḍi), but the old name of the village is Muttammālpuram = 'Lady Margaret's Town'.

- Paḍanilai** ? Paḍunilam.—Waste ground, un-irrigated land.
- Paḍappugudi** { from paḍappai, a stall, yard, garden, enclosure for agricultural purposes.
- Paḍar-kallu-pottai** { 'Strewn-stone-barren,' an upland gravelly waste in N.E. Trichinopoly.
- Paḍavai** for paḍugai, a low tract or flat by the river side.
- Paḍugai** { an outlying hamlet, a cluster of huts at some distance from the village; arable land near a river.
- Pāgalmēḍu** { 'Pāgalmoodoo' of A.S. 79. There is no specially high ground (mēḍu) here to account for the name. Pāgal, Jack-fruit tree: also a garden creeper.
- 'Palagaram' ? for Paḷai-
yagaram.** { A.S. 79, 7 miles E. of Kumbakōnam, no place of this name heard of now, but might mean 'Old Agraharam' as there is a flourishing village called Puttagaram (New Agraharam) very near the site of the name given.
- Paḷlam** { low land; a hollow, valley, dale or dell (cf. Lat. *palus* a marsh, *pool*): cf. Tam. *pulam* and *pollai*, field, and Can. *hola* a field, hole a lake or river, &c., &c., all low places. This is a common affix to place-names in the Delta of the Kaveri, especially near the S.E. Coast and near the river channels, e.g., Kāchanpaḷlam.
- Pallivīdai** { 'Pallans-place' or 'Pallars grant'; vidai alone, means liberty, leave, permission.
- Palliyēri** { for Palliyarai which means a bed chamber, this village having been granted to the great Tanjore temple as an endowment to meet the expense incurred in putting the god and goddess to bed daily.
- Pāmaniyaṛ** { 'Pāmani-river,' from a place near Mannargudi named after a snake-wearing deity. Pāmbu a snake, ani wearing.
- Pāmbanāṛ** { The river forming the south-eastern limit of Tanjore District. Pāmbu = snake, ani = wearing. Persons of the Naga or serpent race are represented as wearing a snake or many-headed Naga over their hood-fashion.
- Pāmbanōdai** { Pāmban (= snake) water-course. Odai a channel, a dry water-course (from Tam. *Oḍu* = run) S. Coast usage. In Tanjore and northwards, a pool.
- Pandanallūr** { Ball (player's) Nallūr. The god and goddess at the temple here are represented as playing at ball; pandu a ball. Cf. H. *pinḍa* a ball, *bundle*. Palmyra-fort; see next.
- Panaiyakkōttai** { The palmyra palm. In Tanjore the palmyra is rather scarce and inferior. Can the Tamil name be derived from Sans. *pāṇi* the hand?
- Panai** { a division, share, &c., lot. Chinna Manika-paṅgu near Tranquebar.
- paṅgu**

- Pannateru Fr. Pannagam serpent, and tharu? (thari for Sans. dhara) = wearer = *serpent-wearer* = Pam-ani, q.v. This is one of the *Negapatam* (= *Nāgapattanam*) and *Nāgar* cluster of serpent names; near Tiruturaipundi. Cf. Pannagam.
- Papanāsam "Pāvanāsi" of A.S. 79. For Sans. Pava-vināsam = 'sin-extinction'; name of a place on a branch of the Kaveri, where a legend is told of a Chōla prince who made a pilgrimage hither and was cured of his disease (idiocy), and in gratitude built a temple to Pavavināśasvami the remover of sins. There is another Papanāsam, a sacred bathing place, or Tirtham in Tinnevely on the Tamraparai river.
- Parāñchēri The 'Praunchary' of A.S. 79, 2 ms. E.N.E. of Kumbakōnam.
- Parappanēri ? *Scorpion lak*; fr. parappan a scorpion (? fr. para to hurry or dart about.)
- Parattai The 'Purayta' of A.S. 79, 2 or 3 ms. N. of Kumbakōnam; ? = 'tangled or matted locks'; ? for scrub jungle, bush, &c.
- Paravanār A broad river channel or drainage line running from near Vridhāchalam to the sea at Cuddalore; perhaps once the bed of the Manimuktār which now falls into the Vellar at Kūḍali-āttūr; paravu signifies spread = broad.
- Paridhikōttai A fortified village named after the local deity Paridhivanēśvar from Sans. Paridhi = the sun, a halo, glory, disk, &c., vanam a wood, grove, &c. and isvar lord.
- Paruppar or Paḷuppar .. Proper name of a (?) Jain image found in the N.E. of the Tanjore and Trichinopoly districts.
- Parutikōttai or Parutikkōttai. Cotton (plant) fort. Parutti is not an infrequent prefix to village names in the Southern portion of Tanjore.
- Pattacheri or Patuacheri Common usage for a fishing village on the coast of the Kaveri delta; also patticheri.
- padi A part, division, one-half. Ten-padi = southern part, Vaḍa-padi = northern part.
- Pattisvaran 'Lord of the fold,' vulgarly pronounced and written Patti-yēsuran the 'Patti Yeshuran' of A.S. 79; from patti a cattle-fold, and isvara = Lord, possessor. Pattisvaran is a large temple near Kumbakōnam.
- pattu a common affix to place-names in Tanjore and north-eastwards; derivation uncertain. It is said to signify 'attached,' 'appertaining,' or 'belonging to' as if from parru (= patturu) to seize, embrace, attach, &c. The final u is mute, Chengalpat (for list of -pattu met in or near Tanjore, see below). It sometimes becomes vetṭu (improperly), e.g., Kanakapattu for Kanakkarpattu, near Chidambaram.

- In Tanjore S. of the delta towards Pattu-kōttai, Ambala-pattu Arasa-p., Arusutti-p., Kandutan-p., Kulacha-p. Naḍu-p., Nallambādi-p., Naval-p., Sikkala-p., Tellaram-p., Tiruvēgam-p., Tondarān-p., Vadakkai-p., and Vanni-p. (bis). Irupai-p., Kanakara-p., Matham-p., Vanam-p. and Vettiār-p., south of Vellar. North of Vellar, -pattu becomes more frequent again; Kaliyal-p., Kallāp., Kal-p., Malli-p., Māmpala-p., Maṇḍa-p., &c., &c., and it is probably common as far north as Madras; Chengalpatt(u) and Chēttuppattu (= Chetpat). With -pattu compare patti a fold, padi a (village) row, paḍu settlement, abode, paḍa Mar. = Tam. paḍagai an out-lying hamlet, pata = Mal. paṭam, a flat, range of rice fields, pattanam, pattachēri or pattičēri, pēttai, patta-mānyam (village head-man), pattaḍai a stock, heap, &c.), pattaī bark (of tree), stripe, &c., paḍu and paḍugai a pit, pondhole, tank; ? root paḍu lie down, settle, pave, set, suffer, &c.
- pattu (no meaning given) Patt-is most common in this vicinity, e.g., on the East Coast Pattachēri, -pattu, see above, and patti to the S.W. The ancient Bataē (Bata) is placed in this neighbourhood; many place-names have the affix -pattu near here: see previous word.
- Pattukōttai Several instances of this name. Payiri is a certain edible plant: payir means growing grain, crop, herbage, shrubbery.
- Payiri local use for Paṅganāḍu or Pañjanāḍu. There is a Paingalūr not far off this place. Paing means five (5).
- Paingāṇāḍu = 'Wild sugar-cane fort' properly Peykarumbu-kōttai. Pey = tiend, devil; in comp. pēy means wild, as plants, &c.
- Pekarumbukōttai 'Great town,' of common occurrence in S. India, but it is said in Tanjore to mean Kallar's town; Peruman (or Perammai) a Kallar caste title.
- Perambūr an affix to place-names in S. India especially in Tinnevely.
- pēri Tam. periya, peru, pēr, = great. Tel. pedda and peda. Cf. H. bara and baḍa = great.
- Periyarekkunnam 'Great hero's dwelling' Peruman is one of the hundred caste names or titles amongst the (Kallars?). See Perambūr.
- Perumaṅguḍi the 'Pirompundi' of A.S. 79 "Great Paṇḍi-yan."
- Perumpāṇḍi Tel. pēta Kan. pētē a suburb or village with shops, a market town. In Tulu pēntē = bazaar, Mahr. pēnth, market, also pēth. Can pēttai be from Sans. root pīt to sound, assemble, heap, together, &c., whence piṭa (mod. piṭara) a basket for grain, and piṭam a house, hovel, roof; pēta a large basket, also a crowd: pētagam a company,

- Pettai**—(Continued). { Tel. Përam = trade? Is not the pettai a shop, store, or continual market (in contradistinction to Tam. Santai a weekly market or fair), an introduction from the North of India? and has not the word been brought into use by the early Muham-madans into S. India? They are great traders and merchants. pedu is also an affix to village names: but compare pattacheri, pattu, pettinam and patti. all common in this part of India.
- Pichanür** .. { ? from Pichai the watermelon. Pichai means also, alms, charity.
- Pidagai** .. { applied to a subordinate village or sub-division. Cf. pudam a side, and puram outside, a suburb, also spelt pudagai.
- Pidari** .. { a fierce tutelary goddess or gramadevata whose temples are numerous in Tanjore villages especially in those occupied by low caste folk.
- Pillaiyar** .. { 'The honourable son' (of Siva), called in the north Ganësa and Ganapati = 'Lord of hosts,' also Vighnësvara = 'Lord or Remover of obstacles.' His temples, or shrines with his image having an elephant's head and a man's body with a pot belly are to be seen everywhere. Cf. Lat. filius, &c., &c.
- Pinnaiyür** .. { ? fr. Pinnai, a younger sister; also a flowering tree yielding oil (Calophyllum inophyllum).
- Pirambur** .. { (Māyaveram Taluk) 'Rattan-cane town' Sans. name Vetravanapura. Cf. Hind. bêt or bent, a cane.
- Pirandai or Pirandai** .. { a garden of tulsi plants, sacred to Vishnu.
- poli** .. { a boundary (? poli a bank in a rice field) Tiru-v-alam-poli = 'sacred banyan boundary.'
- Ponvilainda nallür** .. { Gold-producing-Nallür from its fertility (see next). Ponvilainja is the vulgar form.
- Porpadiñja nallür** .. { 'Porpundaganulloor' of A. S. 79. 'Golden-crop-nallür' from pon (= H. sona) gold and padiñju = planting.
- 'Porto Novo'** .. { Called Muhammad (or Mahmud) Bandar; but the station is known as Farangi-pettaï.
- Pottan kañu** .. { 'barren jungle;' see next.
- Pottai** .. { a barren, and not for pottai, a lump or hummock which is commonly applied to a hillock in Tinnevely. Pottai an arid tract; fallow ground; pottai = blindness.
- Pondu or Pontu** .. { a hole.
- Pudagai** .. { a sub-village or hamlet, a detached street or hamlet = Pidagai, q.v.
- Pudukkalam** .. { 'new threshing floor.' Pudu or pudiya = new, and kalam = area, arena; a threshing floor.

* Connected perhaps with the word pichan (bhikkhuka), a beggar, a common expression in South India.—G. O.

- Puduyeri** .. { New lake. Pudu new, and eri a big reservoir, or irrigation tank.
- pulam** .. { a field, not uncommon, e.g., Karuppan-pulam = 'black field,' Nedum-pulam = 'long field,' Cf. Tam. polai, Tel. polanu, Kan. hola, a field.
- Pulavankañu** .. { ? from pulavan, a sage, philosopher, &c. "Wiseman's wood."
- Puliyam pallam** .. { 'Tamarind-dell' the 'Mallayamalam of A.S. 79. puli = sourness.
- Puliyam tañgal** .. { 'Tamarind tank' Tañgal is rare in Tanjore, but common to the northward.
- Pandañameñu** .. { pronounced pūndara or pundaya-mūru (Flower-garden-mound); see next.
- Puñdi and Puñi** .. { = shrubbery, garden, or grove; from pūndu or puñu a plant, herb, shrub, &c., in Tanjore and northwards. In Madras coast districts, Pūndi is a common name for a village; Pushpavana-śvaran the name of the local god here points to pū (Tam. equivalent for Sans. pushpa a flower) for the derivation. Cf. Ponthamalli (Ang. "Poonamallee") for Pāvīrunthamalli (? vali); pūndu in Tam. = flower, shrub. Tirupūndi and Tirutarupūndi are so named from the Bel-tree groves there, sacred to Siva.
- Puttagaram** .. { New agr(ah)aram, 'new house' for Pudu-agra-haram.
- Puttūr** .. { "New Town," Pudu or puthu = new in compn. putt.; also puthiya, new.
- Pavaraśuvettikkañu** .. { 'Portia-felled field.' Portia, the English name of the Thespesia populnea, like Paras, its Dec. Hind. name, is from the Tamil Pavarasu, which is from pū = flower, and arasa (maram) = Raja's (tree). The Pipal (Ficus religiosa) is in Tam. Arasa-, Tel. raya- or rāgi-mānu, royal tree, and the portia is the Flowering-pipal. It is a kind of hibiscus and grows freely in S. India, flourishing most near the sea shore. The common English name in Madras is Tulip tree. See Vettikkañu.
- Pāvattūr** .. { ? from pū flower, and ūr = village.
- Ragamvettikkañu** .. { (prond. Ragamattikkañu) = Ragan's clearing: vettu = cut, dig, &c. See Vettikkañu.
- Rāgammāl** .. { Proper name of a princess. Sans. raga = love, passion, music; ammal = lady.
- Raja-Mannarguñi** .. { Royal Mannarguñi (Princes' abode), to distin-guish it from Kañtu-Mannarguñi.
- Ramanellār** .. { name of an island in the Kollaḍam (Coleroon) river.
- Rāramuttiraikottai** .. { a corruption of some proper name perhaps Rāja-muttu-rāja's fort.
- Rasalikudikkañu** .. { ? from Irasāli a large kind of hawk (? Rajali).
- Rayapuram** .. { ? Raja's Town or Royal city.

ON THE NAMES OF

Reṇḍankattalai	.. { 'second grant,' one of the seven katt'lai villages 6 ma. E. of Kumbhakōṇam. See Kattalai.
Reṭṭavayal	.. { Perhaps for Irattavayal = double-field; reṇḍu is the vulgar usage for irāṇḍu two, and reṭṭayāna for irattayāna double.
Śāliyamangalam	.. { also named Achuthapuram, a Railway Station, South Indian Railway. There is a local tradition of Śālivahana as founder: but the name is more probably derived from Saliyar weavers.
Samuttiram	.. { Tam. form of the Sans. Samudra or Samundar, a lake, large sheet of water, the sea, ocean; from Sans. Sam = together with = gathering, collection, meeting, and Sans. uda and udra = water. Gr. ṽḍap, Lat. unda and udus, Gothic Vato, Lith. woda, Esthon wott, &c.
Santai-peṭṭai	.. { 'Fair-town' or 'Market street,' a weekly market place or periodical bazaar, from santi to meet, meeting, (Sans. sandha), and peṭṭai, q. v.
Śaraṅgaṇi	.. { a name of Vishnu at Kumbhakōṇam as 'the bow-man,' Śaraṅga a bow, and ṇi the hand, 'Bowarmed.'
Śattambādi	.. { ? Sattan's (= Ayanār's) place; paḍi a row, hamlet. Sans. Śaṣṭa = teacher.
Śattanūr	.. { (common) Sattan a popular tutelary god, better known as Ayanār; see last.
Śattanūr	.. { in one instance near Tanjore it is said to be short for Savittriyammāl, a Nāyakan princess, who founded it.
Śattivilagam	.. { ? for Chetti, or for Satti power, prowess; vilagam = field of battle (vilāsam = pleasure). the "Cheththemangalam" of A.S. 79 = 'Real-mangalam' from Sans. Satya, true, genuine; and is a very common name in Tanjore for a flourishing village with rice fields.
Śattiyamangalam	.. { pronounced Saunar or Shevunar; name of a small caste or sect of people in S. India. This name was found applied to a Jaina image at Jayankop-Paruppar (Pazhuppar). The Greeks and Arabians were called Sōnaga (= Yavana) = ? Ionians.
Śavunar	.. { ? Seykal = arable or tilled land; (? from Chey a corn field, cultivation); there are several places in Tanjore and to the southward named Śekal, Shakal, Sikal and the 'Sikkie' of A.S. 79, properly Sikkil.
Śekal	.. { ? Redman's abode. Se, sem = red, straight, beautiful, Semman is a shoemaker, currier.
Śembaṅguḍi	.. { ? Sendira = red; kaḍai = bazaar. Vallam (q. v.) is found repeatedly in Tanjore and northwards.
Śendirakaḍai Vallam	.. {

PLACES IN TANJORE.

Sēppalanattam	.. { Vulg. Sēppalath, for Seyyapperumal nattam ? = Beautiful Perumal's (Great one's) village. The present village temple is sacred to Aiyanaṛ as if the worship of Viṣṇu had given way to that of Śiva; but Aiyanaṛ is the demon god, son of Viṣṇu and Śiva; hence called, Hari-hara-putra.
Serumangalam	.. { ? 'War-mangalam.' Seru = battle.
Śēṭṭitaṅgalēri or Śēṭṭiyaṅkalēri.	.. { 'Chetti's support lake,' or 'Chettiyan's channel tank;' taṅgal means a support, prop, &c., and so also does kāl; taṅgal is applied to a pond or (? natural) tank, but kāl to a channel or water-course, = kālvaṅ and vaykkāl.
Śīyaḷi	.. { More properly Śīrkālī (சீர்க்காலி).
Śōlamādevi	.. { 'Chōlan's great goddess' mā for maha. See Vikkiramadi.
Śōlapuram	.. { Chōlan's town, not a rare name in the old Chōlamandalam (Coromandel). Cf. Shōranūr which is equally common.
Śikkalapattu	.. { The 'Shakeapattu' of A.S. 79.
Śippiliyūr	.. { For Śrī = holy, puli = tiger and ūr town. Puliyūr is more common in South Arcot.
Śittalattūr	.. { 'Little Ālattūr' chiru = little, in combination before a vowel chirr-pronounced, and very often written, chitt—or as here, Sitt-Ālattūr; Little-banyan town.
Śittamalli	.. { Or Suttamalli; one or two other places called malli met with, besides Puvirunthamalli (Poona-malee).
Śivakkollai	.. { 'Red field,' from se, sen, sivappu = redness; and kollai a field, enclosure; the soil is of a very ruddy color. See Chengāḍu.
Śōrakkuḍi	.. { ? from Śōrakkāy a kind of pumpkin.
Śrīpurandān	.. {
Sundaraperumal Kōvil.	.. { Beautiful Perumal's (great one's) temple, given as 'Shandalla-permalcovil' on A.S. 79 and vulgarly pronounced Sandala, &c.
Sūriyamaṇal	.. { Sūriyan the sun, and maṇal = sand, dust, gravel; 'Suriyan's sand.'
Suvāmi (or Svāmi) malai	.. { Sans. Svāmi = Lord, from Sva = own, self (cf. Lat. suus). Dr. Burnell inclines to identify this with the old Malakūta of the Chinese pilgrim Hōuen Tsang.
Talaṅgumbādi or Taraṅgumbādi	.. { (Tranquebar) formerly a Danish settlement. The name may mean Telingan's street or village. There are a few other places in Tanjore with Teluṅcan prefixed. The Telingan, or Telugu folk, were early called Tlings (mod. Kling). Cf. Kalinga-paṭṭanam.
Talava paḷaiyam	.. { 'Commander's fief.' Talaivan = Head man; and Dalavāy is the common title for the Generallissimo, or, prime minister at a Native South Indian Court.

- Talai vanam .. { Tal or Tari (cf. *toddy*), 'Palmyra-(palm)-forest,' another name for Tiruppanandal (q.v.)
Sacred palmyra place.
- Telungar kōttagam .. { the 'Thullingar Cōttagam' of A.S. 80 = *Telin-*
gam's mere, properly Talainayarkōttagam. ? Kōt-
tagam a pond, tank: a temple.
- Tāṇḍavāntōttam .. { Tāṇḍavan's garden: tōttam a garden from
tōṇḍu = dig.
- Tāṇḍal .. { a support, prop, often applied to a *tank* in North
and South Arcot Districts, rare in Tanjore. The
water is raised or supported by the embankment.
Cf. ēri and enthal.
- Tanjore .. { strictly Tāñja-ūr, familiarly called Tāñjai by
the natives. It is more fully given as Tāñjai-mā-
nagaram = *Tāñjan's-great-city*, after its founder.
But tāñjam means refuge, shelter. Tāñjaiman is
also given as the founder's name.
- Taraṅgambāḍi .. = "Tranquebar" for *Talaṅgambāḍi* (q.v.)
- Tattannūr ..
- Tekkīruppu .. { 'South-ham,' Southern-dwelling. Ten, Terku,
tek- = southern; iruppu = residence, abode,
dwelling, from iru = sit, be, remain, dwell, &c.
See under Tennalguḍi.
- Telūṅḡankuḍikkāḍ .. { 'Teliṅḡan's-cottages'; see *Talaṅgambāḍi*.
- Tennalguḍi .. { ? South-dwelling: ten- terk- tek- &c. =
South; Tennai the coconut (tree). Cf. Sans.
dakshina (= Right-hand = south) = dakhin (Ang.
Deccan) in Tam. becomes tetchinam, and tekkinam,
? whence ten. In a similar way Vaḍa = north
uttara = upper = northern. Tetchinam Pottai,
The Southmost hillock (at Cape Comorin).
- Tenpāḍi vaṭṭam .. { Southern division of the vaṭṭam (circuit, a
group of villages).
- Teru .. { = a street, vulgarly called Teruvu and applied
to a row of cottages, or the hamlets scattered
about a large village or parish. Cf. Mal. thara.
- Teru or Theru .. { vulgar usage in Tanjore for Tiru sacred, auspi-
cious (= saint), the Tamil form of the Sans. sri.
It is also the name of Lakshmi.
- Tiḍal .. { a mound, same as teḍal, tiḍar, tiṭṭai, &c. a little
hill or rising ground.
- Tillai vanam .. { Chidambaram (q.v.) Tillai a tree with milky sap.
Perhaps Yules "Thelleyr" may be for Tillaiyūr:
but cf. Thalai near Tirutarapāṇḍi, and Tellūr in
South Arcot.
- Tiruchirai .. { name of a place and temple 7 miles S.E. of
Kumbhakōnam. 'Tiricheri' of A.S. 79 and 'Tirri-
cherra' of Colonel Lambton's chart. Can this be
a place dedicated to a *three-headed* (Tri-sira)
devata? Sarantha-Perumāl is the name given;
compare Tri-sira-palli = Trichinopoly = Three-
headed (one's) town.

- Tirukalā-ūr .. { There are several places of this name in Tanjore:
e.g., Tirukkalabur and Terrucolatur A.S. 79; see
Teru.
- Tirukōnapuram .. { 'Terrukanapuram' of A.S. 79. Can this be
for 'Tri-kōna-pura' = 'Three-corner town' as
Tiru-kōna-malai for Tri-kōna-malai, i.e., "Trinco-
malee" = the three peaked or triangular moun-
tain, on the east coast of Ceylon?
- Tirukarugāvūr .. { the Sans. name is Garbha-raksha-puri, and both
names signify that females in bearing never mis-
carry at this place, a tradition believed to this day.
Sans. Garbha = womb, Tam. karu = embryo,
foetus.
- Tirumalairājapuram .. { These names of great public works, may have
reference to the great Tirumala Nayakkan, who
ruled over Madura and Trichinopoly in the 17th
century.
- Tirumalaisamudram ..
- Tirumattēri .. { Common usage for Tiruma-eri; see *Vīranattēri*.
(Vulgarly called also Tiruvaṇamaṅgalam) 'Holy
soil maṅgalam'; maṇ = earth, soil. A large mound
of debris marks the ancient site.
- Tirumaṇamaṅgalam .. { A place and large temple dedicated to Naga-
natha-svami = 'Snake-lord-god' near Kumbha-
kōnam.
- Tirunāḡesvaram .. { 'Sacred-milk passage,' a place with a consider-
able but neglected temple on the river-channel
near Pāpanāsam, and another at Śīraṅgam:
turai a ford (q.v.)
- Tirupalturai .. { 'Sacred palmyra station'; dal or thāl for sthāla;
a large Śiva temple 10 miles N.N.E. of Kumbha-
kōnam. The place is remarkable for the groves of
palmyras by which it is enveloped, as they are not
common or large in the Kaveri Delta. Another
name of it is Talaivanam, q.v. 'Toddy-tree-wood.'
- Tiruppanandal .. { Commonly called Teru-perumaiyam (*Terru-*
perrumbam of A.S. 79). See Teru.
- Tirupirambiyam .. { 'Sacred flower-forest'; there are other instances
of this name in South India, one of them near
Madura; the A.S. gives the name *Tirbovam*
here, and *Trippawanam* there.
- Tirupūvanam .. { 'holy northern marudūr (agricultural village),
more properly Tiruvidai-marudūr = 'holy-middle-
marudūr.' Sans. name is Madhyarjunam; idai
= the middle.
- Tiruvaḍa marudūr .. { Tiruvaḍi is a corruption for Tiruvaiyār = five
rivers. Sans. name Pañchanadi, which also means
five streams (= Pañjab). Cf. Tiruvaḍi (? Tiru-
vadigai) South Arcot.
- Tiruvaḍi .. { 'Sacred-right (hand) curl,' the image of Vighnēś-
vara has its elephant trunk coiled to the right
instead of (as usual) to the left. "Perruvalaṅjuli"
of A. S., but there is a story of a whirlpool (Sulī =
whirl, curl, &c.) in the river, a branch of the
Kaveri here. A curl to the right is a fortunate
mark. Compare the Svastika symbol.¹⁰
- Tiruvalaṅcuḷi ..

¹⁰ At Vallam near Chengalpat is a rock-cut figure of Gaṇeśa with the trunk similarly turned up to the right.

Tiruvālūr ..	..	for Trivāṇur? Town of the three (viz., Brahma, Vishnu, Rudra); or Town of Tiruvallāvar (author of the Kural). It is sacred to Śiva. Valluvan is a low caste family priest. See Muva-lūr.
Tiruvirimalālai ..	..	'Fair-eye-lily'; this is the 'Tirriyavali' of A.S. 79 and 'Tirrimiyala' of Lambton's chart; vilī the eye; commonly Terumallai, and vulgarly Terumuli.
Tittu ..	..	same as Tedal, &c., q.v. a mound, rising ground. Naḍu-tittu-Vinayakam, name of the island in the Kolladam at the 'Lower anaikat.' Naḍu-tittu = Middle-bank. Tittagudi on the Vellar.
Tondai ..	..	Tondai, the Tondamandalam or Tondā region, whose capital was Kañchipuram, is now represented by the Pudukōttai territory, under the Kallar prince still called Tondimān, lying between Tanjore, Trichinopoly and Madura.
Tondarānpaṭṭu ..	..	Tondī is a seaport south of the Tanjore border, and many other names contain Tondā thereabouts; tondū means serve, wait on; also antiquity, feudal service, &c. Cf. Tūḍis, said to be Tundī on the Malabar coast.
Torakkulī ..	..	Perhaps <i>Herd-pit</i> , cattle-hollow, from toru a crowd, herd, &c., and kulī a pit, hollow.
Tōṭṭam ..	..	a garden, (from tōṇḍu = dig) an enclosure (= kollai), orchard. Puntōṭṭam a flower garden.
Tukkachi ..	..	For Turkaiyachi name of a horrible goddess or demoness. ? Durga.
Tulukkar ..	..	the Tamil form of Turukar (fr. Hind. Turushka) Turks, i.e., Muhammadans.
-turai ..	..	a landing place; the ford of a river, the haven of a sea: cf. "wick" and "fiord" a passage, ford, (= ghat, and 'tirath' a watering place), not at all uncommon in Tanjore which is overrun with fordable river channels. See Turaiyūr, Aduturai, Tirupalturai, &c.
Turaiyundakōṭṭai ..	..	Turaiyunda is a Kallar caste title.
Turaiyūr ..	..	= 'Ford town.' See -turai.
Tōṭṭar ..	..	(?) From taru bushes, low jungle, brushwood, with which the country here, N. bank of the Kolladam, is overspread; tōṭṭu (= tutru) means scatter, spread abroad, strew. Cf. Tattukkudi (Tuticorin) <i>Scattered habitation</i> .
Udaiyarpālaiyam ..	..	Udaiyār = the wealthy, rich; a caste or tribe name (udai = wealth); pālaiyam a fief, an estate held under military (or feudal) tenure.
Ukkaḍai ..	..	A suburb? for Ulkidaī a hamlet, or Ulkaḍai an interior, ul = il = within; a house.
Uttukkaḍu ..	..	"spring-field," an oozy place, from uttru a spring, fountain; urru = a spring (fountain) from uru spring ooze, exude.

-ūr ..	..	A country, town, village; township? From uru = be, exist, dwell. Cf. iru. northern (in opposition to ten, terku vulg. tekku south, southern) seems to be a more frequent prefix than ten, southern; and mēl western, than kil eastern. Perhaps connected with S. ud = up, whence uttara the upper, northern.
Vaḍa or Vaḍakku ..	..	Northern paṭṭu.
Vaḍakkipaṭṭu ..	..	'Norham' or Norton; also Vaḍavūr and Vaḍuvūr = North town.
Vaḍavār ..	..	'North river.' The southernmost of the Kāvēri irrigation channels, but so called perhaps because it passes immediately north of the town of Tanjore.
Vaittisvaram ..	..	('Vydesprum' of A.S.) for Vaidisvarapuram, a place and temple between Mayavaram and Siyali dedicated to Vaidisvar.
Valaṅgiman ..	..	a town or large village 5 miles S. of Kumbhakōnam; a story is told that the place is named from a curse uttered here which would in English be something like "cursed pimp of a deer!" mān = deer, hart.
Val }	..	These syllables and vel = ear, point, edge, vél, vel., &c., very frequently occur in Tamil place-names.
Val }	..	beauty, &c., strength, speed; a hillock.
Valam ..	..	Tam. a side, right side, a place, e.g. Alivalam = place of nectar; Pulivalam = tiger's lair, Sikkiyavalam the place of catching (that tiger).
Valarṇthakaṇḍam ..	..	= 'Fertile part': valāru = grow, increase, wax; and kaṇḍam a division. H. Khand.
Valasakkaḍu ..	..	The 'Vullachadud' of A.S. 79 = 'Flight Jungle'; Valasai means a general removal or flight from home, for fear of an army in the field, hence a retreat; refuge; an encampment or settlement of refugees. Uncommon in Tanjore.
Vallam ..	..	Proper name of the place 7 miles south-west of Tanjore. Old Sans. name Indragiri = 'Mount Indra'. The legend is that Vallammāl, widow of Śrikanṭha Chōla, after the battle of Chōlamaligai, a Chōla capital near Kumbhakōnam, being with child took refuge at Indragiri with Kapilamuni, who helped to restore the son born there, Kāla Kaṇṭha Chōlan, to his father's kingdom, who then built a fort and named it Vallam after his mother. One derivation given is val (q.v.) a mound, hillock, Vallam being situate on high ground. There are many places of this name in Tanjore and South Arcot.
Vallam ..	..	In Tirutharupūndi, is said to be so called after Vallamuḍaiyan (= 'Lord of power'.)
Vaḷukkai or Vaḷukkai ..	..	There are two or more places of this name in Tanjore. A.S. 79 gives 'Valkā' and 'Vaulkay'; Vaḷukkai means slippery; vaḷukkai = living = felicity, prosperity.

Vanapattāḍai ..	{ (Bānapattāḍai) agun-powder or fire-work factory; Van a rocket and pattāḍai, a stock, yard, &c.
Vandaiyiruppu ..	{ Vandaiyan a caste name of Kallars: iruppu = dwelling, abode, fr. iru = be, remain, &c.
Vaṇḍal ..	{ Silt, the mud of tanks: grit: affixed to village names in Rāmnād, from their being on a ridge of grit or gravel-drift, on the spoil bank of a tank, or on the grit banks or coarse sand drifts left in the waterway of a flooded river or breached tank.
Vandarampattānam ..	{ (Vaundramputnam of A.S.) said to be a corruption of Vanathariyan-p., for Vānāsūran-pattānam.
Vanni-pattu ..	{ ? from Vanni the suma tree (prosopis spicigera) a sacred tree, used for sacrificial fuel. There is a famous old specimen still alive in the Vridhachalam temple.
Vāṣal ..	{ Common use, but strictly, vāyil = gateway, portal, entrance, from vāy the mouth, and il a house. Paḷivāṣal = meeting house, a school house; amongst the Muhammadans of the south coast = a mosque. The Kannāḍi (Canarese) form is bakilu, vulgo baḡalu.
Vaṭṭam ..	{ A circuit, round, &c., commonly applied in Tanjore to a group of villages under one inspecting official ? from viruttam, S. Vrutta, a round thing, vrit, vritta = rounded, circular, and S. vaṭ vāṭa a rounded figure, circle. Cf. S. paṭ to surround, encompass. Compare paṭṭi a fold, and pattānam, paṭṭinam and paṭṭichēri a town, a fishing village.
Vattiraṇḍu ..	{ ?
Vayal ..	{ A rice field, an open field, or plain, (not the vāyil above, see Vāṣal). Kan. bailu a plain, open field.
Vaykkal ..	{ A water-course, canal, or channel for irrigation; in common use in Tanjore, same as Kālvāy, water-course, or aqueduct; Vēḍapuri vāykkāl.
Vēḍaranyam ..	{ (the 'Vadarnam' of A.S. 80) Sans aranya = wilderness, 'Vēḍa-jungle,' there is a large Śiva temple, and celebrated Tirtha or watering place here.
Veḷakkachiyanman ..	{ Proper name of a village tutelary goddess.
Vellāṅkaḍu ..	{ Vellāṅka one of the Tamil agricultural tribe: vellāṅmai husbandry, agriculture, ? from vellam flood, and āṇmai ruling, master; an irrigator; kaḍu a jungle, forest, &c.
Velaṅḡudi ..	{ Velaṅkāḍ, Velaṅkāṇni, and the like common but unexplained; ḷāṅkaḍu and veḷakāḍu were referred to ḷamāiyana, ḷa and Yelavan meaning young, youthful, tender, &c. See Kan-kaḍu.
Veḷattūr ..	{
Veli ..	{ A common affix to village names, meaning a wall, hedge, a ward; a measure about 5 acres, e.g., Tirunelvēli (Tinnevely); Aiveli = "25 acres." (?)

Veḷi ..	{ a frequent prefix to village names meaning open field, a plain, the open, the air; Veḷipālaiyam the camp or cantonment outside (a fort or town); also used as a suffix, e.g., Kuḷjuveḷi.
Veḷūr ..	{ ? from veḷ a benefit, benefaction; vēḷavi a sacrifice.
Vēmbuḡuḍi ..	{ 'Margosa (or Nim tree) dwelling'; many places in S. India are named from the Vēmbu or Vēppamaram, the Nim of N. India (Azadarachta Indica), which affords a delightful shade in hot weather; the 'Vamboogood' of A.S. 79. The Margosa is not so very common in Tanjore.
Vennār ..	{ a contraction for Vinān-ār Vinān's river: cf. Kannanār.
Veṅkaṭampēṭṭai ..	{ 'Vungadumpett' A.S. 79 (cf. 'Vangadankal' near Nāgūr). Vēṅgai = gold; Vēṅgadam = Tirupati, sacred to Viṣṇu.
Vēṭṭar ..	{ 'The dug river,' from vēṭṭu = dig, and aru a river, or stream; a canal.
Vēṭṭikkaḍu ..	{ 'cleared jungle,' a clearing: vēṭṭu = cut, hew, dig, &c., and kaḍu (q.v.) = wood, jungle.
Vēṭṭiyar-pattu, or -vēṭṭu ..	{ Vēṭṭiyans' settlement or clearing, possibly a mistake for Vēṭṭiyar = Vēṭṭiyans' clearing. The Vēṭṭiyar is the grave-digger of the village community, from vēṭṭu = dig.
Vēṭṭukkūḷi ..	{ the mound of earth thrown up in order to lower a rice field to the proper irrigation level. Vēṭṭu = dig and kūḷi a pit, hollow.
Veyilūr ..	{ A lodging place, temporary abode; a common affix to many village names between Paṭṭukōṭṭai and Pudukōṭṭai, S.S.E. of Tanjore; (?) fr. viḍu = dismiss, let, release.
Viḍudhi ..	{ Vikram's maṅḡalam. Vikkiram is the Tamil form of Vikram. This name occurs repeatedly near the Kollāḍam, and was borne by one or more of the Chōḷa princes.
Vikkiramaṅḡalam ..	{ Vikram's great goddess (Mahā Dēvi). Cf. Śō-lamāḍēvi, q.v.
Vikkiramādi ..	{ a field of battle; a rather frequent suffix to place-names in E. Tanjore. Vilasam = dalliance (? pleasure), and Vilasam for viṣālam = spaciousness, a saloon, pavilion.
Vilāḡam ..	{ Vināyakan's street, in the Naḍu-tiṭṭu Vināyakan, Vināyakan's mound, an island in the Kollāḍam at the lower anaiḡat.
Vināyakan teruvu ..	{ contraction for Vira-Nārayanam, a very large tank a few miles W. of Chidambaram, stretching from the Kollāḍam to the Vellar nearly, and fed by both rivers.
Virānam ..	{ Viranāthan's village, the 'Vernadichari' of A.S. 79.
Viranāthachēri ..	{ the Virā(nāraya) nam-lake; ēri = a lake, sheet of water. See Virānam, and cf. Tirumattēri.
Viranattēri ..	{ the Vashaloor of A.S. Two or more places of this name.
Vishvalūr ..	{

CLASSIFIED TABULAR STATEMENT OF THE CHARACTERISTIC PLACE-NAMES OF THE TANJORE DISTRICT.

Topographical and descriptive words in Tanjore place-names.

-ar. aru .. River.	-ōdai .. Tank, pool.
Kadal- .. Sea.	-padugai .. 'Flats.'
kādu .. Jungle.	Palai .. Barren.
-kal .. Channel.	-pallam .. A hollow, valley.
Kalam .. Threshing floor.	-paravai .. (Water-) spread.
-kanni .. Small channel.	+ Periya- .. Great.
karai .. Bank, shore.	+ -pottal .. Barren.
Kil- .. Eastern.	-pulam .. Field.
-kollai .. 'Close,' field.	-pūndi .. Bush, shrubbery.
E. -kōttagam .. Tank, &c.	Siru- .. Small.
Kōdalūr .. Meeting town.	Ten- .. Southern.
+ -kulam .. Tank.	Terk- .. Southern.
-kuli .. Pit, hollow.	-toppu .. Grove.
E. madugu .. Pool.	-tōttam .. Garden.
Manal- .. Sand.	-turai .. Passage, ford.
Marudur .. Agricultural village.	Vada- .. Northern.
-mēdu, or -mōdu. Mound.	-vanam .. Wood, grove.
Mei- .. Western.	Vayal .. (Rice-) field.
S.E. -molai .. Corner?	-vaykkal .. Water channel.
	-veli .. Open (area), plain.
	Vēttār .. Dug-river, canal.

Place-names indicating Race, Tribe, Caste, and Religion of the People.

Agraram.. Brahman.	Nattan .. ? Countryman.
Aiyan .. Siva.	Nayakkan Telugu title.
Aiyanār .. Demon, village god.	Paḷḷan .. Field laborer.
Amman .. Goddess.	{ Pappan } Brahman.
+ Andi .. Saiva-mendicant.	{ Parppan }
-ēvar .. Išvara, Siva.	+S. Pamban.. Snake (-man).
+S.W. Idaiyan .. Herdsman.	Paravan.. Seaboard tribe.
Išvaran .. Saiva, of Siva.	Perumāl .. Vishnu.
+ Kali .. Demoness.	Pidari .. Demon-goddess.
+S. Kuḷḷar .. (Tribe).	Pillai .. (Caste).
Kottan .. (Caste).	Pillaiyar.. 'Gaṇeśa,' son of Siva.
E. Karaiyan. Fi-herman, coast tribe.	+ Pulaiyan.. 'Flesh-eater.' ?
+ Kuravan.. (Wild tribe).	+ Pulavan .. ? Sage.
Mariyam- Demoness.	Sāvan .. Toddy climber.
man.	Sattan .. Demon god.
Naga .. The cobra.	Semman .. Currier.

- * Signifies that the name is found only or chiefly in the delta.
 + Do. do. do. outside the delta.
 † Signifies that it is rare.
 N., E., S.W. The cardinal direction in which it mainly occurs with reference to the centre of the delta.
 A hyphen prefixed indicates a suffix; affixed, a prefix.

Place-names indicating Race, Tribe, Caste, and Religion of the People—(Continued).

† Śeniyān.. Weaver.	† Tulukkan. Turk.
Setṭiyān.. Chetty, merchant.	† Vadugan.. Northerner.
Svāmi .. Lord.	Valaiyan.. (Bird-) netter.
† Tadan .. Vaishṇava mendi-	Vanniyan. (Caste) title.
cant.	Vēḷḷaḷan.. Tamil agricul-
† Teluṅgan. Telugu.	turist.
† Tēvaḍiyāl. Slave, = 'Dasi.'	† Vēṭṭiyan. (Grave-)digger.

Words commonly affixed or prefixed to proper names of places, meaning abode, enclosure, hamlet, village, town, &c.

*N. -agaram.	†N. -pakkam.
†N. -bakam.	†E. Paṭṭacheri.
-chēri.	† -paṭṭanam.
-gudi.	†W. -paṭṭi.
† -kāḍ.	S. -paṭṭu.
-kāḍai.	* -peṭṭai.
*N. -kollai.	Putt-ār.
†S., &c. -kōṭṭai.	* -pulam.
kōvil.	*N. Pūndi.
-kudi.	-puram.
†S. kuḍikkāḍ.	† -taṅgal.
† -kuḷam.	†S. -teru(vu).
†N.E. -kuppam.	-tōppu.
†S.W., &c. -kurichi.	*N. -tōṭṭam.
-maṅgalam.	-ūr.
+S. -nāḍ.	-vanam.
S. -nallūr.	-vāsāl.
-nattam.	-vaṭṭam.
-nellūr.	-veli.
-nilam.	-vēli.
† -padai.	+S. -viḍuti.

Place-names that appear to be more or less peculiar to the Tanjore District, or unusually frequent there.

Agara-	.. As in Agaraputtār.
-agaram	.. Puttagaram.
Agrāram	{ for Agrahāram, a village, quarter (of a town)
Akaram	} or street of Brahmans.
Aiyanār	.. the S. I. demon king.
Alanguḍi	.. ? banyan hamlet.
Alattur	.. banyan village.

- * Signifies that the name is found only or chiefly in the delta.
 + Do. do. do. outside the delta.
 † Signifies that it is rare.
 N., E., S.W. The cardinal direction in which it mainly occurs with reference to the centre of the delta.
 A hyphen prefixed indicates a suffix; affixed, a prefix.

Place-names that appear to be more or less peculiar to the Tanjore District, or unusually frequent there—(Continued).

Anna-vaśal	} = food-(giving)-place.
Anna-chattram	
Anna-salai	
Arasur	
Attur	= pipal village.
Cholapuram	= river town.
†S. Karaiyanpatti	= Chola-town.
Karuppur.	
Kattalai	....
Kollai	= grant, endowment.
†Kōnam	= enclosure, field, 'close.'
†N. Kunnam	} more common in South Arcot.
E. Kottagam	
†W. Kottangudi	.. ? tank, &c.
†Kōvil- (or Kōil-) pattu.	= Stone mason's dwelling.
†Kudikkadu	.. 'temple tithe.'
†Kuruvadi	.. scattered huts.
E. Marudur	.. low quarter.
†N. Naga, Nagakkudi, N-maṅgalam, Naganti, N-paṭṭanam, Nāgūr, &c.	.. agricultural village.
†E. Ney-kunnam, N-kuppai, N-vaśal.	.. a hollow, low ground.
†S. Pamanai, Pambanar, P-ōdai.	.. most frequent between Paṭṭukōṭṭai and Tanjore.
†E. Paṭṭa(na)cheri.	.. an inferior or sub-village, a hamlet.
†N. Piḍagai or Puḍagai	.. ? shrubby, 'bush.'
†Pundi	.. Sattan (S. Śasta = teacher) a name of Ayanar.
†Sattanar	} .. ? a rising ground, eminence.
†Sattamaṅgalam	
†Valangudi.	.. a circuit, group of villages.
†Vallam	.. ? battle-field. Pavilion.
†-vaṭṭam	.. ? lodge.
†Vilagam	.. ? Iṇṇakāḍ, young forest. A plantation.
†S. Viduti	
†Yalankāḍ	

Words in Tanjore Place-names derived from the Animal (an.) or Vegetable (veg.) Kingdoms, with some examples.

a (an) cow	Avūr, Attalaiyūr.
adu (an) sheep	Aduturai.
al (tree) banyan	Alangudi, Alankāḍ.
† alisi-or arisi-	Alisigudi.
arasu (tree)	'royal'; pipal, ficus religiosa.
atti (tree) fig, ficus racemosa.	
atti baubinia tomentosa.	

- * Signifies that the name is found only or chiefly in the delta.
 † Do. do. outside the delta.
 ‡ Signifies that it is rare.
 § hyphen prefixed indicates a suffix; affixed, a prefix.
 ¶ Signifies absent from the delta only.

Words in Tanjore Place-names derived from the Animal (an.) or Vegetable (veg.) Kingdoms, with some examples—(Continued).

§ avarai (a bush)	cassia auriculata. A.-kad.
avuri (plant)	indigo (i.-fera tinctoria).
chaya (plant).	Cheyattamaṅgai.
elumichai (tree)	lime-fruit, citrus bergamia.
erumai (an)	buffalo. Erumaippadugai.
icham (tree)	wild date, Ichangudi.
ilavam (tree)	cotton tree, bombax.
iluppai (tree)	Indian olive, Bassia longifolia (Mowah).
iñji (plant)	(green) ginger. Iñjikkollai.
§ kacha (plant)	memecylon tinctorium.
kaḍambu (tree)	eugenia racemosa.
kaḍugu (plant),	mustard.
kaḷāñji (plant)	mushroom, fungus.
kaḷli (plant)	euphorbia, milk plant.
kapi (an.)	monkey. Kapistalam.
S karaiyan	white ants.
karumbu (plant)	sugarcane.
kattalai (plant)	aloe.
kattiri (plant)	egg plant, solanum melongena ('brinjal.')
kirai (veg.)	greens. Kirai-kollai.
kō (an.)	cow. Kōmal, Kōvūr.
kodi (creeper)	betel-vine. Kodikkalūr.
kokku (bird)	crane, Kokkalaḍi.
kolli (corn)	gram.
mā (tree)	mango. Maṅkāḍ, Maṅgudi.
maḍu (an.)	ox.
malalai (plant)	lotus; Tiruvilimalalai.
maṇ (an.)	deer Maṅgudi, Valaṅgiman.
maṅjal (plant).	turneric Maṅjal kollai.
maviliṅgam (tree)	(? cratogeom. Rox.) garlic pear.
mayil (an.)	peacock. Mayilāḍi, Mayavaram.
min,	fish Minavaippūr.
mundiri (tree)	cashewnut tree (kaju).
nag	The cobra-snake. Nāgūr, Nāgamaṅgalam.
nari (an.)	fox or jackal. Narikkudi.
naval (veg.)	calyptanthus cariophyllifolia.
nāy (an.)	dog.
nel (veg.)	raw-rice, 'paddy.' Nellār.
nelli (tree)	jungle gooseberry, phyllanthus emblica.
neruñjil (plant).	tribulus terrestris.
ney (? ghee).	Neykunnam, Neykuppai, Neyvaśal.
nochi (plant).	vitex negundo. Nochiyūr.
nunna (tree).	Indian mulberry (morinda umbellata).
ōmai (plant or tree)	Onakkulam.
palai (tree).	mimusops hexandra. Palaipatti.
panai (tree)	palmyra palm. Panaiyūr.
paṅgaṣatam (plant)	lotus, ('tank-born').
parutti (plant).	cotton. Paruttikkōṭṭai.
pekkarumbu (plant)	wild sugar cane.
pila (tree)	jack-fruit. Pilavadi.
pirambu (plant).	the cane (rattan).
puli or pili (an.)	tiger. Puliyūr.

§ Signifies absent from the delta only.



Words in Tanjore Place-names derived from the Animal (an.) or Vegetable (veg.) Kingdoms, with some examples—(Continued).

puli (tree) tamarind. Puliyañcheri.
 panai (an.) cat Pānai-kutti kaḍu.
 pūvaraṣu (tree), tulip tree (Portia).
 sembu (veg.) rank-grass. Sembōḍai.
 tālai (tree) toddy palm, palmyra. Tal or Tār tree.
 tamarai (plant), lotus. Tamarai-pulam.
 tennai (tree) coconut. Tennaiḡuḍi.
 tennai millet.
 tolasai (plant) tulsi: Tolasappattanam.
 tuvarai (plant) lentil, 'dhal.' Tuvarankurichi.
 vaḡai (tree) acacia speciosa.
 vaḡai (tree) plantain.
 vaḡu wasp. Tiruvaḡuturai.
 vanni senna tree, prosopis spicięera.
 vēlam (tree) Velaḡuḍi.
 vēmbu } (tree) margosa or nim-tree.
 vēppam } Vembuḡuḍi, Vēppancheri.
 viḷa (tree) wood-apple. Feronia-Elephantum.
 vilvam (tree) bel tree. Vilavanūr.

Common South Indian place-names not found at all, or but rarely, in Tanjore.

achalam	.. mountain.	malai	.. hill.
anai	.. elephant.	manai	.. house.
baḡi	.. place.	niṭṭa	.. estate.
bakam	.. hamlet=pakkam	naḡu	.. country.
chavadi	.. ang. 'choultry.'	nagaram	.. city.
dasi	.. slave girl.	Nayakkam	.. Nayak.
doddi	.. cattle pound.	paḡi	.. place.
endal	.. tank.	pakkam	.. suburb.
eri	.. lake.	palliyam	.. fief.
giri	.. hill.	palli	.. village.
guṇṭa	.. tank.	pallivāsai	.. mosque.
ḡaiyan	.. shepherd.	paṇai	.. palmyra.
kaḡu	.. forest.	parunbu	.. gravel-mound.
kal	.. stone.	paṇai	.. rock.
Kallan	.. Kallan.	paraiyan	.. 'Pariah.'
kammāy	.. tank.	pattinam	.. town.
karadu	.. rocky mound.	patti	.. fold.
kavai	.. watch, ward.	Reḡḡi	.. Reddi.
kiparu	.. well.	salai	.. hall.
kōdu	.. peak.	sanudram	.. sea.
kōṭṭai	.. fort.	santai	.. fair.
kudikkaḡ	.. huts.	taṅgal	.. small tank.
kudiyiruppu	.. habitation.	taḡagam	.. big tank.
kun(d)ru	.. hill.	teḡal	.. mound.
kuppam	.. hamlet.	ṭruni	.. tank.
kurichi	.. hamlet.	valasai	.. "retreat."
Kurumbar	.. shepherd.	vaḡi	.. yard.
kūṭṭam	.. pond.	vēlan	.. hunter.
maḡam	.. assembly.	vilai	.. corn-field.
	.. college, 'math.'	viḡuḍi	.. lodge.

§ Signifies absent from the delta only.

SOUTH TANJORE.

The following remarks on the place-names of the country along the coast south of the Kāvēri Delta and as far as Rāmnād are based on the lists collected during the season 1876-77 in the absence of the writer:—

The country traversed to which alone the following remarks apply extends only some twenty miles inland from the coast of Palks Straits, the sinus Argaricus of the ancient geographers, and lies between the deltas of the Kāvēri and the Vaigai (? Vēghavati).

It is crossed by a few unimportant streams and water-courses, the principal of which is the southern Vellār, draining the Toṇḍimān or Pudukōṭṭai Rajah's territory, he being the chief, and that the home, of the Kaḷḷar tribe.

Going north-eastwards from Rāmnād (Rāmanāthapuram = Lord Rāma's town) the home of the Maṇavar tribe, the country changes: the flat sandy tracts of the south coast of Madura are left behind, and so are the numerous large tanks and their long collecting channels, which are spread over the impervious black (cotton) soil, and the tracts of rice cultivation below them, characteristic of the alluvial tracts formed by the Vaigai, the river of Madura.

On entering south Tanjore, across the Pāmbanār, though still low and flat, the slope of the country from the sea coast landwards increases from 2 to about 10 feet per mile. A succession of ridges and depressions, some of them 50 feet in depth, run from W.N.W. to E. S. E., the former well wooded with valuable trees, and the latter covered with patches of low-land cultivation (vayal).

This change of country is indicated or illustrated by the prevalent place-names.

There are few towns or large villages, and the village lands (grāmam) resemble townships, parishes, or communes, con-

taining many small hamlets, each bearing the village name, with a distinguishing suffix indicating the relative position of each within the village limits, and often having the suffix *teru*¹¹ = street, in place of the village name.

The following facts may be gathered from a short study of the names on the map (see Indian Atlas, sheet 80):—

- (a.) The comparative absence of rivers, tanks and channels, &c., for irrigation.
- (b.) The absence of hills, mounds, and rocks.
- (c.) That this part of the country has been to a great extent jungle (*kādu* = wilderness, forest), and inhabited by rude unruly irreligious folk, rather pastoral than agricultural, such as Idaiyan, Kallan, Kurumban, Pallan, Valiyan, Vedan, &c.
- (d.) But there is a fair sprinkling of places termed Agraharam, Chattram, Maṅgalam, Maḍam, Paṭṭanam, Pēṭṭai, Santai, Vayal, &c., indicating the presence of more civilized people, and telling of trade, agriculture, and brahmanical influence, especially in the more fertile parts, and along the coast where lies the track of the pilgrims to and from Rāmeśvaram.

Whilst the vegetable kingdom appears to contribute liberally to the onomatology of the district, the animal kingdom is but scantily represented by kokku the crane, mayil the peacock, nari the fox or jackal, and a few others.

These facts are further illustrated by the following groups of common appellative adjuncts to the proper names of south Indian places displaying those which are present and those which are absent, but are found either in the neighbouring districts or more generally throughout the Tamil country.

¹¹ The suffix *-aya* in Malayāla has the same meaning and use.

The common descriptive words affixed to proper names of places prevalent in the southernmost part of the Tanjore District.

d. ¹² Chattram	(E.)	A rest-house for pilgrims.
c. Kādu	(N.)	A jungle, forest, wilderness.
Kollai	(N.)	An enclosure, close field.
c. Kōṭṭai		A fort, fortified village.
Kuḍi	(N.)	A house, cottage, habitation.
c. Kuḍikkāḍ	(N.)	A hamlet (grove of cottages).
c. Kurichi	(W. & N.)	An inferior village, hamlet of cottages.
Nādu		A district, settled country.
Nattam	(W.)	A country village, township.
d. Paṭṭanam	(E.)	A town, especially a seaport town. In 50 miles of this coast there are 24 places called paṭṭanam.
c. Paṭṭi	(W. N. W.)	A cattle fold; village of herdsman.
Paṭṭu	(N.)	? A settlement; a village, or small town.
Puḷli	(S.)	? A mark, cipher; ? a crest.
d. Santai		A market, fair.
d. Santai-pēṭṭai		A market-town.
Teru	(N.)	A street.
-Ur		A town, township village.
Vāṣal	(E.)	A gate, entrance; ? a port.
Vaṭṭam	(N.)	A circuit, group of villages.
d. Vayal		A rice field, paddy-flat, plain.
c. Veṭṭikkaḍu		A clearing; felled wood, field.
Viḍudi	(N. N. W.)	A lodging; a grant;

Characteristic descriptive place-names prevalent in the adjacent districts, not found at all, or but rarely, in South Tanjore.

Ālaṅguḍi	(N.)	Banyan (tree) house.
Ālattūr	(N.)	? Banyan (tree) town.
a. Attār	(N.)	River town.
Cheri	(N. & W.)	Village, hamlet.
Chey		Corn field; paddy fields.
a. Ēndal	(S.)	Tank, hamlet.
a. Kammay	(S.)	Irrigation reservoir.
a. -Karai	(N. E. & S. E.)	Bank, shore.
Karīsal	(S.)	Black (-soil).
Karuppār	(N.)	? Black-town.
Marudūr	(N.)	? Grain-land; corn town.
Marava	(S.)	Marava tribe.
Nallār		Good-town.
Nellār		Rice-town.
Ney-	(N.)	? Weaving-(village).
Nilam	(N.)	Land, particular soil.
a. Ōḍai	(N. & S.)	Water-course, ditch, tank.
Palli	(W. N. W.)	Village, small town.
Pōṭṭal	(S.)	Barren soil, brackish ground.
Pūḍi, pūṇḍi	(N. E.)	? Shrubbery, grove.
a. Taravai	(S.)	Waste, a salt marsh.
a. Turai	(N. E. & S. E.)	Ford, passage, landing place.
a. Ūruṇi	(S.)	Village tank.
Vaṇḍal	(S.)	Deposit of silt, sandbank.
Vilagam	(N. E.)	? Field of battle.

¹² See overleaf for meaning of letters prefixed.

The following common descriptive place-names, so prevalent elsewhere in Southern India, are absent or very rare in South Tanjore :—

Chēri, dodḍi, kōvil, kuppai, kuppam, pākkam, pālaiyam, puram, vādi and valasai, the commonest affixes to the proper names of villages and hamlets in the Tamil country.

(a.) Āru, ēri, guṇṭa, kāl, kuḷam, kuṭṭai, samudram, and vāykkāl, the common affixes meaning river, lake, pond, tank, and channel or canal.

(b.) Kāl, karaḍu, kunnam, mēḍu, pārai, parambu, teḍal, tiṭṭu, signifying rock, mound, hillock, mount, as well as giri, kuṇḍru and malai, meaning hill, mountain.

The letters *a, b, c,* and *d* prefixed refer to the abovenamed inferences, viz., (*a.*) the absence of great sources of irrigation ; (*b.*) the absence of hills and rocks ; (*c.*) the want of cultivation in the country and people ; and (*d.*) that a proportion of names indicating the presence of a more northern culture and civilization still does exist.

The letters N.E., S.W., affixed indicate the direction with reference to the centre of the tract under notice in which the word or name mostly occurs.

Besides the excessive frequency of the affix paṭṭanam on the coast noticed in the first group, the following particulars may be noted ; the southern limit, and maximum frequency of the affix paṭṭu occur together in the northern part of this tract, between the towns of Tanjore, Paṭṭu-kōṭṭai and Pudukōṭṭai ; also that the affix viḍudi seems to be peculiar to the same locality, or rather nearer to Pudukōṭṭai.

CLASSIFIED LIST OF COMMON TAMIL PLACE-NAMES AND TAMIL WORDS FOUND IN THEM ; TRANSLITERATED FROM THE TAMIL.

I.

Prefixes.

Adichēri ..	.. suburb, hamlet.	Ney-?, Nesavu ..	weaving.
Agara ..	.. chief.	Pal ..	.. milk.
Anna ..	.. (cooked) food.	Pala ..	.. old.
Aṇam, Aran- ..	.. virtue, charity = dharm.	Periya, Peru ..	.. great.
Arasan ..	.. king, rajah.	Pin (nai) ..	.. behind.
Aru ..	.. six ; (a river).	Pon (nai) ..	.. golden.
Arun ..	.. beauty, a fortress.	Pū, Pushpa ..	.. flower.
Chinna ..	.. small.	Puḍu, Puṭhiya ..	.. new.
Ida- ..	.. left (side).	Puram ..	.. side, outside.
Karu, Kar ..	.. black.	Rasi ..	.. heap.
Katt- ..	.. wild, jungle.	Se, sen, Śegappu ..	red, right.
Kaval ..	.. ward, guard.	Si for Śri ..	.. auspicious, good = tiru.
Kil-e ..	.. eastern, lower.	Śiru, Śitt- ..	.. small, little.
Kuruvi ..	.. little bird.	Śivappu ..	.. red.
Koḍai ..	.. alms.	Śri, Śi ..	.. fortunate, good.
Man, Mad- ..	.. soil, sandy.	Sundara ..	.. beautiful.
Mani ..	.. gem, bell.	Ten, Terku ..	.. southern.
Mēlc, Merku ..	.. western, upper.	Tēr ..	.. idols car.
Mudi ..	.. crown, knot.	Tiru (= Śri) ..	.. holy, auspicious.
Murtti ..	.. idol, image.	Ul- ..	.. within.
Muttu ..	.. pearl.	Vaḍa- ..	.. northern.
Nadu- ..	.. middle.	Vala- ..	.. right side.
Nallu, Nan- ..	.. good, fair.	Vel, Ven- ..	.. white, silver.
Neḍu- ..	.. long.		

II.

N.B.—In these columns the article *as* is omitted.

Affixes.

Agraharam ..	.. brahman's village.	idam ..	.. place.
-alayam ..	.. place, temple.	iruppu ..	.. dwelling.
ambalam ..	.. court, hall.	kaḍai ..	.. end, market.
-andal ..	.. ? for enthal = highness, a tank.	kattalai ..	.. grant, endowment.
aramanai ..	.. king's house, palace.	kaṭṭu ..	.. tie, building.
chattram ..	.. rest-house.	kiḍai ..	.. fold, yard, 'khed-dah.'
chavaḍi, Anglice ..	'choultry,' Native rest-house, &c.	kiḍangu ..	.. store, tank, 'go-down.'
chēri ..	.. village, gathering.	kōil, kōvil ..	.. temple.
chey ..	.. rice field.	kollai ..	.. close, field.
dodḍi ..	.. pen, pound.	kond- ..	.. ? a title.
ellai ..	.. boundary.	kōṭṭai ..	.. pond, temple.
gōpuram ..	.. tower, spire.	ko ..	.. fort.
gammam ..	.. village, parish.	kōṭṭam ..	.. stable, cowshed.
		kōṭṭara ..	.. big shed, postico, pavilion.

II—(Continued).

kuchu ..	.. cottage, hut.	pattanacheri ..	.. a fishing village.
kudi ..	.. house, dwelling.	pattanam ..	.. town. A seaport
kudikkad ..	.. cottages, huts, &c.		.. town.
kudisai ..	.. cottage.	patti ..	.. hamlet, cattle fold.
kudiyiruppu ..	.. habitation, hamlet.	pattu, pat ..	.. village.
kuppam ..	.. ? a mount, hillock.	-peri ..	.. ?
kuppam ..	.. hamlet of low folk.	-pettai ..	.. village (with
kurichi ..	.. hamlets of poor people.		shops).
kuruvadi ..	.. sub village or hamlet.	pidagai, pudagai ..	.. sub-village, or
	.. village, assemb-		hamlet.
kuttam ..	.. village, assemb-	poli ..	.. boundary.
madam ..	.. college, 'math.'	pudi ..	.. village.
manai ..	.. mansion, house.	-pulli ..	.. hamlet, spot.
mandai ..	.. herd, collection.	pundi ..	.. (grove), village.
mandalam ..	.. region, country.	pur-a, -am, -i ..	.. town, city.
mandapam ..	.. open court or hall.	salai ..	.. court or public
mandalam ..	.. flourishing village.		building, hall.
maniyam ..	.. freehold.	santai ..	.. fair, (weekly)
marudur ..	.. agricultural or		market.
	rice-growing	sulai ..	.. kiln, furnace.
	village.	talai ..	.. head, a place.
madudi, masjid ..	.. mosque.	talam, sthalam ..	.. place, station.
mitta, mutta ..	.. freehold, estate.	teru(vu) ..	.. a street.
mulai ..	.. corner, nook,	ar, uru ..	.. town or village.
	house.	vada ..	.. a ward, quarter.
nad, nadu ..	.. district, country.	vadi ..	.. enclosure, yard.
nagaram ..	.. big town, city.	valasai ..	.. 'retreat,' refuge.
nallur ..	.. 'good ville,' fair-	-varam ..	.. for puram, a town.
	town.	vas, vasi ..	.. dwelling, abode.
nattam ..	.. common village	vasal (-vayil) ..	.. doorway, port.
	site.	vati-pathi ..	.. abode.
nilam ..	.. ground, soil, land.	vattam ..	.. circuit, group.
-padi, pathi ..	.. part, share.	vayal ..	.. a rice-field, flat.
-padi ..	.. village, row.	veli ..	.. a hedge, a 5-acre
-pakkam ..	.. village.		field.
palaiyam ..	.. a fief, canton.	vellai ..	.. a corn-field.
palli ..	.. a village, town.	vidai ..	.. ? grant, leave,
pallivasal ..	.. a mosque, school.	vidu ..	.. permit.
-pangu ..	.. a division, share.	vidudi ..	.. house.
paracheri ..	.. outcaste's hamlet,	vilagam ..	.. lodge.
	suburb.	vilai ..	.. field of battle?
		vidi, vidhi ..	.. fertile field.
			.. street.

III.

Topographical.

achalam ..	.. mountain.	eri ..	.. lake, mere sheet
aranyam ..	.. jungle, waste.		of water.
aru, ar ..	.. river.	gangai ..	.. water, a river.
chey ..	.. (rice) fi-	giri ..	.. hill.
chelai ..	.. grove, -ab	ka ..	.. wood, grove.
endal ..	.. tank, reser	kadai ..	.. sea.

NOTE.—The names or words are transliterated from the Tamil, and not given according to the Madras Government list of 20th August 1878.

III—(Continued).

kadavu ..	.. passage.	parambu ..	.. stony mound, gra-
kaduvu, kathavu ..	.. door.		velly waste.
kadu, kad ..	.. jungle, waste,	paravai ..	.. expanse, sea.
	wild.	-padu ..	.. upland.
kal, kallu ..	.. stone, rock.	-peri ..	.. ?
kal ..	.. limb, channel, (2).	polai ..	.. a field.
kalam ..	.. threshing floor,	pondu ..	.. hole, cave.
	arena.	pottai (putti) ..	.. mount, hillock.
kalar ..	.. barren soil.	pottal ..	.. barren ground.
kammay ..	.. tank.	pulam ..	.. field.
kanavay ..	.. pass, defile.	pundi and pudi ..	.. shrubby, garden
kanni ..	.. channel, water-	samudram ..	.. water gathering,
	course.		sea, lake.
karaðu ..	.. rugged mound.	sikaram ..	.. pinnacle, spire.
karai ..	.. bank, shore.	taðagam ..	.. big tank, reser-
kayal ..	.. lagoon.		voir,
kepi ..	.. tank, pond.	talai ..	.. head, source, site.
kebi, kugai, kavi ..	.. a cave, cavern.	tamarai ..	.. tank with lotus,
kinaru ..	.. well.		'lily-pool.'
kodi ..	.. point, cape.	taðgal ..	.. support, a tank.
kodu ..	.. horn, ridge, peak.	tanpi(r) ..	.. water.
kombai ..	.. basin, valley.	tarai ..	.. place, terrace.
kongam ..	.. corner, nook.	taravai ..	.. salt swamp, waste.
kovalam ..	.. cape, headland.	tattai ..	.. platform shelf.
kuðal ..	.. junction, conflu-	teðal ..	.. mound, rising
	ence.		ground.
kuðam ..	.. tank, reservoir.	teri ..	.. drifting sand,
kuji ..	.. pit, hole.		waste.
kunðu ..	.. ball, boulder,	tiðar, tittu ..	.. hillock, mound.
	rock.	tinuai ..	.. bank, mound.
kup(ð)ru ..	.. hill, also kuppam.	tirtham ..	.. bathing, or water-
kuppai ..	.. heap, hillock,		ing place.
	dunghill.	tiyu ..	.. island (dvipa)
kuttai ..	.. tank.	töppu ..	.. grove (? stupa).
madai ..	.. sluice.	tötam ..	.. garden.
maði ..	.. (rice) field, bed,	turavu ..	.. well.
	plot.	turai ..	.. passage, ford,
maðu ..	.. pool, water, hole.		landing.
madagu ..	.. sluice, drain, con-	Üruni ..	.. pond, tank.
	duit.	Ütt(r)u ..	.. spring, fountain.
malai ..	.. hill.	Val ..	.. power, a mound.
map ..	.. earth.	Vala(m) ..	.. right (hand).
mapal, mapam ..	.. sand.	vanam ..	.. a wood, grove,
meðu, möðu ..	.. mound, eminence.		jungle.
mottai ..	.. bald, bare.	vandai ..	.. mire, silt.
mugi ..	.. crown, crest.	varai ..	.. slope, border, hill.
mugam ..	.. mouth, face, en-	vaykkal ..	.. water channel.
	trance.	veli ..	.. the open, outside,
munai, mundal ..	.. headland, cape.		area.
öðai ..	.. pool, water-course.	veli ..	.. hedge, 5-acres of
paðugai ..	.. flats (by river		land.
	side).	vellai ..	.. whiteness, a corn-
paijai ..	.. barren.		field.
pallam ..	.. low ground, a	vellam ..	.. flood, inundation.
	hollow.	vettar ..	.. canal (dug-river).
parai ..	.. rock.	vilagam ..	.. battle-field.

IV.

A FEW COMMON TAMIL PROPER NAMES.

ETHNOLOGICAL, HISTORIC, RELIGIOUS, &c.

Achari	.. preceptor 'Wor-shipful.'	Mudali	.. a Vellalar caste title.
Aiyan	.. pastor, 'guru,' Saiva brahman.	Murti	.. form, idol, image.
Aiyanar	.. Demon god Hari-hara.	Naga	.. cobra snake.
Aiyar	.. brahmans (Saiva).	Narayana	.. name of Vishnu.
Ammai	.. Parvati; (small-pox).	Nattan	.. countryman, rustic.
Amman	.. lady, goddess.	Nayakkan	.. of Telugu race: a title.
Anni	.. saiva mendicant.	Ottan	.. (tank-) digger, builder.
Arasappalli	.. (caste).	Pallan	.. low caste cultivator.
Asuran	.. demigod, demon.	Palli	.. a low caste laborer.
Avudaiyar	.. ox owner, Lingam (or Siva).	Pamban	.. snake wearer.
Ayan	.. cowherd, pastor.	Pappan	.. Brahman.
Chakkiliyan	.. currier.	Paraiyan	.. musician, <i>Pariah</i> outcaste.
Chetti	.. merchant (Seth).	Paramesvara	.. supreme lord.
Dasi	.. slave girl.	Paravan	.. a low caste of S. coast.
Devendra	.. god of heaven, Indra.	Parppan	.. Brahman = Pappan.
Devi	.. goddess.	Perumal	.. great one, Vishnu.
Elamman	.. a tutelary demoness.	Pey	.. demon, devil.
Idaiyan	.. herdsman.	Pidari	.. demoness.
Isana	.. regent of the N.E.	Pillai	.. a Vellalar caste title.
Isvara	.. supreme lord, Siva.	Pillaiyar	.. the honorable son (of Siva).
Kallan	.. Kalla casteman.	Pulaiyan	.. ? flesh eater.
Kali	.. Parvati, consort of Siva.	Rada	.. Krishna's mistress.
Kariyan	.. shoreman, coaster.	Rama	.. Vishnu Avatara.
Kattan	.. a mighty demon.	Reddi	.. a Telugu tribe.
Kattari	.. a fearful demoness.	Rudra	.. Siva.
Kaupdan	.. Gauda tribe man.	Saliyan	.. weaver.
Kon, Konan	.. shepherd king, pastor.	Saman	.. ? sraman.
Kottan	.. mason, bricklayer.	Sapan	.. toddy climber, Shanar.
Kriahna	.. Vishnu Avatara.	Sattan	.. Aiyanar.
Kurumban	.. shepherd tribe.	Sattani	.. Vishnu mendicant.
Kuruvan	.. wild 'gipsy tribe.'	Savunar	.. ? (Jaina).
Kudavan (Kuyavan)	.. potter.	Semman	.. shoemaker, currier.
Labbe	.. S. I. Muhammadan.	Sepiyan	.. weaver.
Latchmi	.. (Lakshmi).	Siva	.. the supreme, Isvara.
Liagan	.. Phallic emblem of Siva.	Somesvar	.. moon lord.
Mapillai	.. son-in-law (<i>Moplah</i>).	Sonagan	.. Yavanan ? v. ? Greek.
Maravan	.. Marava tribe-man.		
Mariyamman	.. Death, goddess.		

IV.—(Continued).

Subramanya	.. auspicious, Lakshmi.	Vanigan	.. merchant, banyan.
Svami	.. God of war.	Vaniyan	.. oil-monger.
Tachchan	.. Lord.	Vappan	.. washerman.
Tadan	.. carpenter.	Vanniyan	.. Palli caste man.
	.. Vishnu mendi-	Vedan	.. hunter.
	cant.	Vellalan	.. Tamil cultivator tribe.
Telungan	.. Telugu.	Vettiyan	.. grave-digger, &c.
Tevan	.. Maravar caste title.	Vinayaka	.. son of Siva.
Tiyan	.. Islander, low caste.	Vishnu	.. god, the preserver.
Totti	.. scavenger.	Yadavan	.. a tribe.
Tulukkan	.. Turk.	Yavanar	.. Greeks most likely Arabians.
Vadugan	.. northerner, Telugu.	Yenadi	.. a tribe also called Irular.
Valaiyan	.. netman, bird-catcher.		

V.

NATURAL PRODUCTIONS.

Flora.

Al	.. banyan.	Ma, man	.. mango.
Arasu	.. pipal.	Malalai	.. lotus, lily.
Arisi	.. rice.	Manjal	.. turmeric.
Atti	.. fig (<i>racemosa</i>).	Mavilingai	.. garlic pear, <i>Crataeva Rox.</i>
Atti	.. baubinia tomentosa.	Mundiri	.. cashew-nut tree.
Avurai ? avirai	.. shrub (<i>cassia auriculata</i>).	Mudgil	.. bamboo.
Avuri	.. indigo plant.	Navai	.. jambo tree <i>Calyptranthes</i> .
Elumichai	.. lime fruit, lemon tree.	Nel	.. (Raw) rice, paddy.
Icham	.. wild date.	Nelli	.. jungle gooseberry.
Ilavam	.. cotton tree, bombax.	Neruñjil	.. plant, <i>Tribulus terrestris</i> .
Iluppai	.. Indian olive, <i>bassia longf.</i>	Nochi	.. plant, <i>Vitex negundo</i> .
Inji	.. ginger plant.	Nunna	.. <i>Morinda umbellata</i> .
Kadambu	.. tree, (<i>Eugenia racemosa</i>).	Omai	.. the mango.
Kadugu	.. mustard plant.	Palai	.. tree <i>Mimusops hexandra</i> .
Kalli	.. milk plant, <i>Euphorbia</i> .	Panai	.. palmyra-palm.
Karumbu	.. sugar cane.	Parutti	.. cotton plant.
Kattari	.. eggplant (<i>solanum mel</i>).	Pila	.. jack fruit tree.
Kirai	.. greens.	Pirambu	.. rattan cane.
Kollu	.. kulti gram, horse corn.	Puji, puliya	.. tamarind.
		Puvassu	.. tulip tree, portia.
		Tamarai	.. lotus.

V—(Continued).

Tennai ..	.. coconut.	Velam, vel.	.. thorn.
Tolassai ..	.. tulsi plant.	Vēmbu, vēppam	margosa, nim.
Tuvarai ..	.. lentil (dhal).	Vila ..	.. wood apple (fero-
Vagai ..	.. siras tree (acacia spec.).	Vilvam ..	.. bal-tree.
Vanni ..	.. suma tree, prosopis spic.		

VI.

Fauna.

* Aju ..	.. cow.	kuruvi ..	.. little bird.
Anai ..	.. sheep.	kuṭṭi ..	.. kid, kit, cub.
erumai ..	.. elephant.	maḍu ..	.. ox.
go ..	.. buffalo.	man ..	.. deer.
kakkai ..	.. cow.	mandi ..	.. monkey.
kajugu ..	.. crow.	mayil ..	.. peacock.
kajuthai ..	.. eagle.	min ..	.. fish.
kapi ..	.. ass.	musal, muyal	.. hare.
karadi ..	.. ape.	naga ..	.. cobra snake.
kokku ..	.. bear.	nari ..	.. fox, jackal.
kōji ..	.. crane.	nay ..	.. dog.
kōṇay or onay	.. fowl.	paṣu ..	.. cow, cattle,
kudirai ..	.. wolf.	pili or puli	(<i>bos, pecus.</i>)
kuri ..	.. horse.	pūnai (pūṇai)	.. tiger.
	.. sheep.		.. cat (Puss).

R. B. BRANFILL.

IV.

A BRIEF SKETCH OF THE YERUKALA LANGUAGE AS SPOKEN IN RAJAHMANDRY.¹

THE Yerukalas do not seem to have any distinctive tribal or national name. In conversation with each other they call themselves "Kuluvuru," evidently from the Sanskrit "kula," merely signifying "our people," while to strangers they speak of themselves as Yerukalavaru, a name most probably given them by their Telugu neighbors (Telugu యెరకల) in allusion to their supposed skill in palmistry, which they practise as a means of livelihood. The Yeruka in question was not able to say when his people settled in Rajahmandry. He only knew that a long time ago they came from the west and have been living here in the same place and in the same way for several generations. For a livelihood they make baskets, tell fortunes, and breed pigs for their own use and for sale. They know nothing of agriculture or keeping

¹ This brief sketch was communicated to the Editor by Colonel R. M. Macdonald, the Director of Public Instruction in Madras. The following is a letter addressed to Colonel Macdonald by Mr. Metcalfe, Principal of the Rajahmandry College:—

"Sir,—During your visit to Rajahmandry a few months ago you were somewhat interested in a little colony of Yerukalas, located in the suburbs, and suggested that possibly an examination of the peculiar language spoken by these isolated groups of an apparently distinct race might serve to determine their origin and the affinity they bear to the other races of Southern India. Accordingly, on the occasion of a visit from the Rev. J. Cain, C.M.S., who has bestowed much attention upon the Kōi languages in the neighborhood of Dommugudem, I arranged an interview between a Yeruka who has the reputation of being the best-informed member of his community, and two of my Assistants, Messrs. A. G. Subramanyam Iyer, B.A., (Vernacular: Tamil) and P. Strinivasa Rao Pantulu, B.A., (Vernacular: Telugu and Kanarese) who under Mr. Cain's direction asked the man a series of questions, the answers to which they have been at some pains to embody in the accompanying account. This I think you will find interesting, and it may be of use for the purpose of comparison with the results of similar enquiries conducted in other localities at Guntur, for instance, where I hear there is a Yerukala settlement."

cattle, their mode of life in this respect being amusingly evidenced by their possessing only one or two generic names for sheep and cattle, while their vocabulary is well supplied with words indicating very subtle distinctions between different kinds of pigs. Their customs are generally of a very simple character. They burn their dead with little ceremony, and at their marriages make a feast, of which plentiful libations of arrack and toddy constitute the chief feature. They live principally on cholum, raggy, preferring rice when they can afford it; but they do not disdain the mongoose, the guana, and even the common cat as an article of diet. They have no written language, nor have they any songs of their own. Such as they do sing are Telugu songs. The information obtained from the Yeruka in question is perhaps hardly sufficient to render possible any definite rules with regard to the structure and idiom of the language. The few observations here made may, therefore, need considerable modification, but there appears to be little doubt that the language belongs to the Dravidian family. The following collection of words and phrases seems to show conclusively that of these languages it bears the closest affinity to Tamil, although possessing words allied to Telugu and Canarese. It is of course difficult to say whether the few Telugu words, phrases, and case-endings that are to be found in it really belong to it or have unconsciously crept in during the long sojourn of this community in the Telugu districts; but this could be ascertained by comparing the language of this settlement with that spoken by Yerukalas in some Tamil district.

The principal points in which Yerukala agrees with Tamil are—

- (1.) A large number of words denoting objects of primary importance correspond with Tamil (see Table I).

- (2.) The plural terminations *mar*, *ru*, *ga*, *gal*, *lu* are Tamil terminations or their modifications, the first two being restricted to rational nouns as in Tamil and the rest to irrational nouns. *Mar* is suffixed to nouns, signifying relations, and is also used as an honorific termination.
- (3.) The numerals *ondu*, &c., are for the most part corruptions of Tamil words.
- (4.) The Yerukala pronouns bear resemblance to Tamil and Canarese pronouns.
- (5.) Yerukala forms its infinitive by adding *a* to the root and the verbal noun by adding *tam*, *do* or *dam*, *do* to the infinitive, in which case it resembles Telugu.
- (6.) The negative particles *illa*, *əə* and *alla*, *əə* are Tamil or Canarese words.
- (7.) As in Tamil the present and past tenses are formed by adding *ikkir*, *əə* or *(kiru, əə)* and *ta* *ə* (*da* *ə* &c.) respectively to the simple forms of words.
- (8.) The future is formed by adding *k* to the root, and this is sometimes found in old Tamil words.
- (9.) The demonstrative and interrogative pronouns *adu* *əə*, *idu* *əə*, *edu* *əə* are Tamil words.

Adjectives are formed by adding *a*, *e* either to the crude forms, or the crude forms modified by doubling the final consonant.

In the Yerukala language there is no inflexion for gender. The neuter noun which ends in *ə* stands for both masculine and feminine.

TABLE I.—Words allied to Tamil.

No.	English.	Yerukala.	Tamil.
1	Father.	tapan.	takappan.
2	Mother.	taī.	taī.
3	Papa (familiarly).	ava.*	appa.
4	Mamma do.	amma.*	amma.
5	Elder brother.	anna.*	anna.
6	Younger brother.	tembi.	tambi.
7	Elder sister.	akka.*	akka.
8	Younger sister.	tevisi.	taṅgacci, taṅge.
9	Wife.	ponḍu.*	peṇḍati, peṇḍu.
10	Grandfather.	tatam.	tata.
11	Son.	moganu.	makan.
12	Daughter.	mogulu.	makaḷ.
13	Brother-in-law.	mecunu.	maccinan.
14	Father-in-law.	mama.*	mama.
15	Son-in-law.	merumoganu.	marumakan.
16	Daughter-in-law.	merumogulu.	marumakaḷ.
17	Grandson.	pētam.	pēran.
18	Granddaughter.	pēti.	pētti.
19	Ear.	kadana.	kādu.
20	Eye.	kan.*	kaṇ.
21	Mouth.	vai.	vai.
22	Nose.	mūḷana.	mūḷku.
23	Hand.	kei.	kai.
24	Leg.	kāl.*	kāl.
25	Tongue.	nāk.	naḷku.
26	Tooth.	pelu.*	pal.
27	House.	ūḍu.	viḍu.
28	Entrance.	vāsali.	vāśal.
29	Ox.	māḍu.	māḍu.
30	Sheep.	āḍu.	āḍu.
31	Pig.	pandri.	pandri.
32	Cat.	pūne.	pūne.
33	Sun.	proddu.*	poḷ'udu.
34	Moon.	nela.	nela.
35	River.	ar.	aru.
36	Tank.	eri.	eri.
37	Water.	tanni.	tanni.
38	Well.	gendri.	kinaru.
39	Earth.	terra.	taraī.
40	Fruit.	pagam.	paḷ'am.
41	Fish.	mina.	min.
42	Crane.	kokku.	kokku.
43	Crocodile.	modala.	modalai.
44	Dog.	nai.	nai.
45	Rice.	erisi.	arisi.
46	Rice (boiled).	sōru.	chōlam.
47	Chollum.	cōlam.	chōlam.
48	Raggy.	kēvuru.	kēj'virakū.
49	Tree.	maram, ōdi.	maram.

* The words marked with a star are as well connected with Telugu.—G. O.

No.	English.	Yerukala.	Tamil.
50	Palmyra tree.	pananjeḍi, panama- ram.	panamaram.
51	Sweetness.	tipu.*	tittippu.
52	Sour.	puli.	puli.
53	Bitter.	keccu.	kaṣappu.
54	Whiteness.	valupu.	veluppu.
55	Black.	kar.	kar.
56	Eat.	unu.	unu.
57	Drink.	kudī.	kudī.
58	Beat.	mottu.	mottu, aḍi.
59	See.	pāru.	pār.
60	Hear.	keru.	kēlu.
61	Walk.	naḍu.*	na'ḍu.
62	Run.	ōḍu.	ōḍu.
63	Tell.	sol.	sol.
64	Sleep.	orugu.	uraṅgū.
65	Kill.	kollu.	kollu.
66	Laughing.	śiruguṭam.	śirikkiradū.
67	Weep.	aidu.	aj'u.
68	Come.	vā.	vā.
69	Go.	pō.*	pō.
70	Mongoose	kiri.	kiri.
71	Squirrel.	ani.	ani.
72	Rat.	eni.	eli.
73	Rain.	maga.	maj'ai.
74	Hair.	moguru.	mayir.
75	Stone.	kellu.	kallu.
76	Great.	bēru.	peri.
77	Small.	ciru.	śiru.
78	Yellow.	maḷja.	maḷja.
79	Leaf.	ela.	ele.
80	Branch.	kommu.*	kombu.

TABLE II.—Pure Yerukala Words, or those allied to Telugu.

English.	Yerukala.	English.	Yerukala.
Unripe fruit.	lētakapanam.	Kick.	ogi. Canarese
Bark.	beraḍu.		odi.
Mountain.	Koṇḍa	Call.	agi.
Stream.	nāg.	Knit.	caccu.
Husband.	monāgam.	Uncle.	soṭṭam.
Sister-in-law.	naṅga.	King.	karagada.
Knife.	kolli.	Person.	koruvu.
Head.	onḍu.	Boy.	gunṭam.
Finger.	ālu.	Male.	avala.
Neck.	kegam.	Seven.	ōgu.
Mat.	capa.	Toddy.	ōḍu.
Plough.	nāgali.	Salt.	nōnam.
Bird.	kuṇḍu.	Snake.	tōna.
Grass.	gaḍḍi.	Sunshine.	oga.
Foot or footstep.	aḍugu.	Red.	erra.

* The words marked with a star are as well connected with Telugu.—G. O.

Plural endings are galu, ga, lu, māru, ru. Some nouns form their plural by adding *galu* to the singular, as—

kegam	..	kegaṅgalu.	mādu	..	māḍugalu.
adu	..	aḍugalu.	natchatram	..	natchatraṅgalu.
kapaṇam	..	kapaṇaṅgalu.			

The final *lu* is generally omitted as in the following words:—

adu	..	aḍuga.	nak	..	nāga.
kuṅju	..	kumjuga.	pellu	..	pelluga.
celug	..	celugga.	oṇḍu	..	oṇḍuga.
kolu	..	koluga.	bhujam	..	bhujāṅga.
mina	..	minaga.	ēlu	..	ēluga, eraḱalu.
modala	..	modalaga.	kalu	..	kaluga.
cūpaṇam	..	cūpaṇaṅga.			

Nouns forming their plural by adding *lu*—

kei	..	keilu.	ēr	..	erlu.
nai	..	nailu.	vasali	..	vasallu.
pūna	..	pānlu.	kiri	..	kirlu.
pandri	..	pandrilu.	ani	..	anilu.
ar	..	arlu.	eni	..	enilu.

Nouns whose plurals are formed by adding *māru* to the singular—

tāpan	..	tāpamāru.	teviṣi	..	teviṣimāru.
ava	..	avamāru.	ponḍu	..	ponḍumāru.
temci	..	temcimāru.	monāgam	..	monāgamāru.
annam	..	annamāru.	maganu	..	makkamāru.
tatam	..	tatamāru.	pētām	..	pētāmāru.
appa	..	appamāru.	pēti	..	pētīmāru.
akka	..	akkamāru.			

Nouns forming their plural by adding *ru* to the singular—

mensam	..	mensaru.
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Gender.

This language has no grammatical gender, as there are no terminations for the masculine and the feminine. The neuter noun stands for all the three genders.

The neuter singular suffix is *ad* and the plural suffix is *ayyalu*, *vāradu*, *vārayyalu*. However the gender is denoted by (1) different words, (2) by prefixing to the words denoting gender, as—

ponḍu	..	monāgam.
teṭci	..	teviṣi.
avalakēruvu	..	paidikēruvu.

Case.

As in Sanskrit and Telugu there seem to be eight cases in the Yerukala language. The case terminations appear to be pure

Telugu case endings except *keivi*, *kōvi*, and *muḍu* which are either pure Yerukala terminations or corruptions of Canarese endings.

Nominative	..	subba	..	ṣedi.
Accusative	..	subbani or subbana	..	ṣedini.
Instrumental	..		..	ṣedikeivi.
Conjunctive	..	subbamtoṭi	..	ṣeditoti.
Dative	..	subbamki	..	ṣediki.
Ablative	..	subbanunci	..	ṣedinunci.
Genitive	..	subbamudū	..	ṣedimuḍu.
Locative	..	{subbakōli	..	{ṣedikōli.
Vocative	..	{subbamāṭi	..	{ṣedī.
	..	subba	..	

Adjective.

Adjectives generally appear to be formed by adding *a* and *i* either to the crude form or the crude form modified by doubling the final consonant or adding some inflexional increment as *ttu*, as

karu	..	karuttu.
velu	..	vella.

TABLE III.—Table of Pronouns.

English.	Yerukala.	Tamil.	English.	Yerukala.	Tamil.
I	nēnu	nān.	We	naṅgal	naṁ.
My	naṅga	en.	Our	naṁber	naṅgal.
Mine	naṁboḍudu	ennuḍayadu.	Ours	naṅgaldu	nammudaya.
Me	nanna	ennai.	Us	naṁbardu	nammudayaḍu.
				naṅgalna	nammai.
					naṅgalai.
Thou	ninu	ni.	You	ningal	niṅgal.
Thy	niṅga	unnudaya.	Your	niṁgal	vuṅgaludaya.
Thine	niṁboḍudu	unnudayadu.	Yours	vuṅgaldu	vuṅgaludayaḍu.
Thee	niṁna	unnai.	You	ningalna	vuṅgalai.
He	ad	avan.	They	ayyalu	avar.
His	asaga	avanudaya.	Their	asaga	avargal.
His	attamoḍudu	avanudayadu	Theirs	asagaldu	avarudaya.
Him	atta	avanai.	Them	asai	avarai.
				asagalna	

The numerals are all modifications of Tamil, Telugu, and

Canarese words with the exception of *vōgu* (7) which seems to be a pure Yerukala word—

One	..	ondu.	Eight	..	ottu.
Two	..	rendu.	Nine	..	ombadu.
Three	..	maḍu.	Ten	..	pottu.
Four	..	nalugu.	Twenty	..	iruvadu.
Five	..	aṇḍu.	Thirty	..	muppadu.
Six	..	aru.	Forty	..	naluvadu.
Seven	..	ōgu.			

The Yerukala people in this part of the country do not seem to have words for numerals over forty.

The demonstrative pronouns are—

Singular.		Plural.	
ad.	..	naṅgalu	.. (patiketikkīro).
id.	..	niṅgalu	.. (patiketikkīramga).
ed.	..	ayyalu	.. (patiketikkīrum).
Present.		Past.	
I see a horse	..	akudirinapatiketikkīra.	..
You see a horse	..	nivukudirinapatiketikkīra.	..
Yesterday	..	adkudirinapatiketikkīra.	..
The day before yesterday	..	nēcu.	..
	..	mundunēcu.	..
Future.		Present.	
1. nekudirina	..	pāte	..
2. nivu	..	pāta	..
3. ad	..	pāta	..
	..	pāta	..
Future.		Present.	
1. nekudirina	..	pāke	..
2. nivu	..	pākka	..
3. ad	..	pākaku	..
to eat	..	pākaku	..
Future.		Present.	
1. nekudirina	..	unḍuketikkīre	..
2. nivu	..	unḍuketikkīra	..
3. ad	..	unḍuketikkīra	..
	..	unḍuketikkīra	..
Future.		Present.	
1. nekudirina	..	unḍe	..
2. nivu	..	unḍa	..
3. ad	..	unḍu	..
	..	unḍu	..
Future.		Present.	
1. nekudirina	..	unke	..
2. nivu	..	unka	..
3. ad	..	ungama	..
	..	ungama	..

From the table we see the terminations forming the present, past, and future tenses are *ikkir* (*ta*, *ḍa*, or their modifications) and *ka*, and that these terminations are added to the crude form of the verbs or their modifications.

The particles denoting the 1st and 2nd person singular in all the tenses are *e* and *a*, and those denoting the 3rd person singular are *u* in the present, *cu* in the past, and *ak* in the future.

In the plural the particles are the same in all the tenses; they are *o* in the 1st, *aṅgalu* in the 2nd, and *um* in the 3rd persons.

Mood.

The infinitive is formed by adding *aṭam* and *aḍam* as *cēyutām*, *pāḍaṭam*, *umḡaṭam*, *ōḍaṭam*.

Indicative	..	nēnu cētikṣṭikkīre.
Imperative	..	cēi, pāru, ḍḍu which are the simple forms of the verbs.
Potential	{ may	.. cēyavaccu.
	{ can	.. cēyagarrey.
	{ must	.. cēyām.

the first being the Telugu termination, and the 2nd a corruption of the Telugu *gala*.

Subjunctive .. *cēdikē*, *vamḍikē*, *e* denoting if.

The following are the forms of the Yerukala verb corresponding to the avyayamulu in Telugu:—

cūci	..	pati.
cūcucu	..	patikēti.
teliyaka	..	aride pōḡade pakade, kollade.*
cēyan (cēyutaku)	..	cēyarataku.
unḍan (unḍutaku)	..	aḍarataku.
pōvuḍun	..	pōnaparikili.

Phrases and sentences showing the use of participles, &c.

vaccucunnavāḍevaḍu	..	vāraduyēdu.
vaccināḍevaḍu	..	vandaduyēdu.
rāḡalavāḍevaḍu	..	vāraduyēdu.
rānivaḍu	..	vārāradu.
endaru	..	ettanēru.
cēyarādu	..	cēyamāna.
kādu	..	alla.
lēdu	..	illa.
nēnu teccinacarra	..	nēnu yettinrakōlu.
atanivaddakupōyepilu pimeu	..	attamātakupōye ayṭi.
atanitōmāḡaḍinatarvātacepputānu	..	atatōtīvāsittanākaṣṇāka.
bhōjanamuccēsinarvātapaṇḍukoni-nāru.	..	sōruvunḍaperikinijarugbeum.

* These bear resemblance to Canarese words.

99300
M33
M79

nēnu vastuvundagā atani jacinānu ..	nēnu vandigēdi gēppe attapātē vand
varuvaccinattiyēpani istānu ..	ayyalu varattānikēn pani koḍikke.
varuvaccinappuḍu ..	ayyaluvandappuḍu.
epuḍuvaccināvu ..	epuḍuvanda.
ekkaḍikipōināvu ..	emkupōna.
ikkāḍa ..	ingey; iṭu.
bāgunnāva ..	nellaikkira.
come soon ..	bēgenā.
mundupuccukunnā aṭṭāgēvunnadi ..	merudupōṭukimḍrikianage ikkir.
ipanicēyakapōṭekōli dorakadu ..	ipanicēya jōnikēnkulidorakadalla.
ninnarātri caccipōināḍu ..	nēsunavarumātē sattocu.
ninnupiluvanampiṭē vastāva rāva ..	ninnu aipikkikēvārakaillya.
nācētākāḍu ..	nakeilagadalla.
his good ..	adnella menasamgaikkir.
she is my mother ..	adnamgatai.
he is coming with my mother ..	adnamgatai amtevamdige ṭikkir.
one ..	nambaru taivalla kēṭṭen
na ..	nācēta .. nakeili
naku ..	notōṭi .. nāmṭi
navalla ..	nakoraku .. nāgurtinai
ipamḍunamḍu rasamṇāgurimci ..	ipagamukōle rasamilla
peṭṭeṭō ..	two trees .. remdumaram
navadda ..	.. galu or cēllu
nācamṭe ..	.. cedi or maram
..	.. komma, kommalu
..	.. a tree ..
..	.. branch ..
..	.. leaf ..
..	.. ela ella

Adverbs.

Adverbs are generally formed by adding *gā* to adjectives and nouns. It is difficult to say whether this is purely a Yerukala termination or one borrowed from Telugu by the people living in the Telugu country as *nella*, *nellagā*, *karata*, *karatagā*, *menam*, *menānga*. The adverbs *keṭṭa*, *monne*, *aṭagam*, *pelikili* also bear resemblance to Tamil words.

V.

HISTORICAL TABLES CONCERNING THE PRESIDENCY OF FORT ST. GEORGE.

I.—ACQUISITIONS OF TERRITORY BY THE BRITISH IN THE PRESIDENCY OF FORT ST. GEORGE.

No. I.

Year.	Territory.	How acquired, and District now representing it.	Approximate Area.	Land Revenue.
1616 ..	Calicut, Factory of.	Now merged in the town of Calicut, the capital of the district of Malabar. (1.) Factory established by permission of the Zamorin or Raja of Calicut, the ancestor of the present Zamorin (Thornton's Gazetteer).	Factory only.	Nil.
1664-65.	..	(2.) Establishment expelled by the Dutch (Bruce ii, 158).		
1668-69.	..	(3.) Agency re-established (Bruce ii, 224).		
1702 ..	..	(4.) 2nd July.—Factory entered in the "Quinque-partite Indenture of Conveyance of the Dead Stock of the two East India Companies."		
1766 ..	..	(5.) Grant of factory and all existing privileges confirmed and ratified by Hyder Ali on his conquest of Malabar, 23rd February (Aitchison, vol. v, p. 127).		
1770 ..	..	(6.) Further ratification by Hyder Ali. Treaty 8th August (Aitchison v, 133).		
1779 ..	..	(7.) English dispossessed by Hyder Ali.		
1782 ..	..	(8.) Reduced by Major Abingdon (Malabar Commission Report, para. 38).		
1784 ..	..	(9.) Treaty dated 11th March. Factory and privileges restored by Tippoo Sultan, Article 9 (Aitchison v, 144).		
..	..	(10.) Ceded with the rest of Malabar to the Company by Tippoo (Aitchison v, 149). Treaty dated 18th March.		

No. II.

Year.	Territory.	How acquired, and District now representing it.	Approximate Area.	Land Revenue.
1621-22.	Pulicat ..	A seaport in the district of Chingleput, 23 miles north of Madras. (1.) Factory established by permission of the Dutch under the operation of the treaty concluded between King James I and the States General, dated 7th July 1619 (Bruce i, 231).	Factory only.	Nil.
1622-23.	..	(2.) Factory withdrawn in consequence of the oppressions of the Dutch (Bruce i, 239).		
1781 ..	..	(3.) Fort, Factory, and Dependencies, viz., the island of Irakam ¹ and the villages of Vanjivakam, Avarivakam, and Kanavandarai (land revenue, 1,475 pagodas) taken from the Dutch by Lord Macartney, Governor of Madras, 2nd July (Local Records).	SQ. MILES. 1,647	RS. 7,338
1786 ..	..	(4.) July.—Restored to Holland under treaty with the States General of 20th May 1784 (Local Records).		
1795 ..	..	(5.) Surrendered to Lord Hobart, the Governor's summons. Capitulation dated 16th July (Local Records).		
1818 ..	..	(6.) 31st March.—Restored to Holland agreeably to the Convention of the Allied Powers in 1814 (Local Records).		
1825 ..	..	(7.) 1st June.—Restored to Great Britain under the treaty of March 1824 (Local Records).		

No. III.

1621-22.	Pettipolee ..	Now Nizampatam, a seaport in the district of Kistna. (1.) Factory established (Bruce i, 232). <i>N.B.</i> —This is the first place at which the English commenced to trade on the Eastern Coast of the continent of India. They landed at Pettipolee, August 20th, 1611; sent goods on shore and left two of the supercargoes, picking them up again on the ship's return from Masulipatam, and proceeding across the Bay to Bantam (Narrative of seventh voyage, London East India Company; Captain Antony Hippon in ship <i>Globe</i>).	Factory only.	Nil.
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¹ The island of Irakam is now attached to the Nellore District.

No. III—(Continued).

Year.	Territory.	How acquired, and District now representing it.	Approximate Area.	Land Revenue.
1653-54.	Pettipolee, (Continued).	(2.) Dissolved (Bruce i, 484).		
1682 ..	..	(3.) Noted as existing, 21st July (Local Records).		
1686 ..	..	(4.) Dissolved again (Bruce ii, 572).		
1697 ..	..	(5.) Re-settled (Bruce ii, 206).		
1702 ..	..	(6.) 2nd July.—The factory is entered in the "Quinque-partite Indenture of Conveyance of the Dead Stock of the two East India Companies," but it was probably soon after dissolved, as there is no further mention of it in the Local Records.		
1763 ..	..	(7.) November.—Ceded to the French by the Nizam, as part of the Northern Circars.		
1769 ..	..	(8.) 14th May.—As part of the Nizampatam Circar bestowed on the English by Salabat Jang, Nizam (Aitchison, vol. v, Treaties). (<i>Vide</i> Acq. No. XXXI).		
1765 ..	..	(9.) August 12th.—Grant confirmed by the Mogul's farmán.		

No. IV.

1621-22.	Masulipatam, Factory of.	The chief town and port of the Kistna District. (1.) Factory established (Bruce i, 239). <i>Note.</i> —The first English vessel that traded at Masulipatam <i>alias</i> Metclepattam arrived there 31st August 1611 (<i>vide</i> Note (1) under Pettipolee).	Factory only.	Nil.
1628 ..	..	(2.) Removal to Armagon owing to exactions of local Governor, one factor being left behind to collect debts, 27th September (Bruce i, 291).		
1632 ..	..	(3.) November.—Factory re-established under the "Golden Phurmaund" of the King of Golconda.		
1689 ..	..	(4.) Factory seized by the local Governor owing to the rupture between Aurangzeb and the Company (Bruce ii, 650).		
1690 ..	..	(5.) Cowle for the factory renewed.—Farmán dated 28th December from Zulfakar Khán, the Mogul General (Local Records).		

BRITISH ACQUISITIONS IN THE

No. IV—(Continued).

Year.	Territory.	How acquired, and District now representing it.	Approximate Area.	Land Revenue.
1702 ..	Masulipatam— (Continued).	(6.) The factory of Masulipatnam is entered in the "Quinque-partite Identure of Conveyance of the Dead Stock of the two East India Companies," dated 2nd July.		
1750 ..	..	(7.) Captured by the French under orders of Dupleix, who sent up a force by sea from Pondicherry, month of July (Orme, Book II).		
1753 ..	..	(8.) November—Formally ceded to France by the Nizam with the rest of the Circars (Orme, Book II).		
1759 ..	..	(9.) Retaken from the French by Colonel Forde, 7th April (Orme, Book II).		
1759 ..	..	(10.) 14th May.—Bestowed on the English Company as an inam or free gift, together with the whole of the Circar of Masulipatam and other territory by the Nizam Salabat Jang (Aitchison's Treaties, vol. v). (Vide Acq. No. XXXI).		
1765 ..	..	(11.) August 12th.—Grant confirmed by the Mogul's farmán.		

No. V.

Year.	Territory.	How acquired, and District now representing it.	Approximate Area.	Land Revenue.
1625-26.	Armagon, Factory of.	A port in the district of Nellore, 66 miles north of Madras.	Fortified Factory only.	Nil.
1641 ..	..	(1.) February (Bruce i, 269).—The ground for the factory was obtained from the local Karnam or Kánúngo, Patnaswámula Arumukham Mudali, and named after him (Nellore Manual, pp. 440-41).		
1661 ..	..	(2.) 24th September.—Establishment removed to the new station, Madras, and the place abandoned altogether (Wilks i, 163).		
	..	(3.) 31st July.—Ceded with the rest of the Carnatic to the East India Company by His Highness Prince Azim-ul-Daula, Nawáb Subahdar of Arcot (Aitchison's Treaties, vol. v). (Vide Acq. No. XLIII).		

PRESIDENCY OF FORT ST. GEORGE.

No. VI.

Year.	Territory.	How acquired, and District now representing it.	Approximate Area.	Land Revenue.
	Viravesaram.	A small town 8 miles north-west of Narsapur Port, Godávári District.	Factory only.	Nil.
1634-35.	..	(a.) Factory established (Bruce i, 326).		
1662-63.	..	(b.) Withdrawn (Bruce ii, 150).		
1677-78.	..	(c.) Re-established (Bruce ii, 409).		
1702 ..	..	(d.) No longer existing. Not in list of Dead Stock taken this year.		
1768 ..	..	(e.) Ceded with Circars (vide Acq. No. XXXIV).		

No. VII.

Year.	Territory.	How acquired, and District now representing it.	Approximate Area.	Land Revenue.
1639 ..	Madrasspatam, Original Settlement of.	(1.) 1st March.—Grant for a station and for the erection of a fort by Sri Ranga Ráyulu (descendant of the Vijayanagar Kings) reigning at Chandragiri, about ninety miles north-west of Madras; obtained for the Company by the local Governor or Naick, Dámarla Venkatádri (ancestor of the present Raja of Kálahasti, c.s.r.) who desired that the station (which was selected "as better calculated for the protection of trade than Armagon") might be styled Chennappa-patnam, after his father Kari Chennappa, which was done; although the Royal grant enjoins the use of the name "Sri Ranga Raya patnam." Mr. Francis Day, one of the Council at Masulipatam, and the head of the factory at Armagon, was the officer who negotiated the affair. The grant covered a space roughly estimated as five miles in length by one mile in breadth (Bruce i, 368, Wilks i, 163, Mill iii, 52).	SQ. MILES. 6.74	RS. 19,879.
1645-46.	..	(2.) The Hindu State of Chandragiri being subverted about this time (Wilks i, 163) by the Mussulman King of Golconda, the Agent and Council at Fort St. George send a deputation, with a present to Golconda, to obtain a confirmation of their privileges (Bruce i, 415). The same authority (i, 455) under the year 1650-51 speaks of the grant having been obtained; but the formal document was not delivered till 1683 (vide (4) <i>infra</i>).		

BRITISH ACQUISITIONS IN THE

No. VII—(Continued).

Year.	Territory.	How acquired, and District now representing it.	Approximate Area.	Land Revenue.
1671-72.	Madraspatam— (Continued).	(3.) Local Records, dated 11th April.—It is agreed to pay the King of Golconda 1,200 pagodas (4,800 rupees) per annum, as rent for the settlement which is to be free from any other imposition for ever; and to pay 11,000 pagodas in full of all demands for the time past.		
1683 ..	..	(4.) Local Records, 12th November.—The Golconda farman formally delivered to Mr. William Gyfford, Governor. Note.—Golconda fell under the arms of Aurangzeb in 1687, and the rent then became an asset of the Mogul Empire.		
1702 ..	..	(5.) 2nd July.—Described in the list of the Dead Stock of the two East India Companies, as "Fort St. George, with the castle and fortifications, and territory thereto belonging: upon which a large city is built, consisting of—houses, which are held of and pay rent to the said Governor and Company, together with the said city and its dependencies."		
1746 ..	..	(6.) September 10th.—Surrendered to the French arms under Labourdonnais. Ransom fixed by him at 11 lakhs of pagodas (44 lakhs of rupees or 440,000 pounds sterling); but the stipulation disregarded by Dupleix (Orme).		
1749 ..	..	(7.) August 15th.—Delivered up by the French under the operation of the treaty of Aix la Chapelle, dated October 7th, 1748 (Orme).		
1752 ..	..	(8.) Local Records, 31st August.—Mahomed Ali (Wallajah), Nawab of Arcot, remits by farman the 1,200 pagodas (4,800 rupees) per annum, the rent heretofore paid for the settlement (<i>vide</i> Note (3) <i>supra</i>).		
1766 ..	..	(9.) August 12th.—Possession confirmed by a farman from the Mogul by way of inam or free gift.		

PRESIDENCY OF FORT ST. GEORGE.

No. VIII.

Year.	Territory.	How acquired, and District now representing it.	Approximate Area.	Land Revenue.
	Madakara ..	Island on the north side of the Billiapatam river, north of Cannanore; is now a part of the Cherakal Taluk.	ACRES. S. GR. 1	RS. 1,120
1669-70.	..	(1.) Obtained from the Raja, i.e., of Cherakal, probably as a trading post on rent.		
1736 ..	..	(2.) March.—Permission granted by the Raja for the erection of a fort.		
1749 ..	..	(3.) May.—The island formally ceded by the Raja as a British possession (Malabar Commission Report, para. 9).		
1762 ..	..	(4.) August.—Fort blown up and island given back to the Vice-Regent of Cherakal. ²		
1792 ..	..	(5.) 18th March.—Ceded by Tippoo with the rest of Malabar and other territory (<i>vide</i> Acq. No. XXXVIII).		

No. IX.

	Madapollam, Factory of.	Makes one village with Narsapur of the Godavari District, 45 miles north of Masulipatam, 6 miles from mouth of the Vasishta branch of the Godavari, and on its right bank.	Factory only.	NIL.
1679 ..	..	(1.) December. — Factory established (Bruce ii, 439).		
1688 ..	..	(2.) August.—Withdrawn (Bruce ii, 654).		
1698 ..	..	(3.) Resettled under orders of Court of Directors.		
1702 ..	..	(4.) Entered in the Dead Stock of the two uniting Companies.		
1757 ..	..	(5.) Captured by the French under Bussy.		
1759 ..	..	(6.) 14th May.—Part of the territory ceded by Nizam's Treaty with Colonel Forde (<i>vide</i> Acq. No. XXXI).		
1766 ..	..	(7.) August 12th.—Grant confirmed by the Mogul's farman.		

² After the fall of Pondicherry and Mahé in 1761, this post which had up to that time been useful in protecting the English Company's trade, and in retarding that of the French Company, was abandoned as no longer of use.

BRITISH ACQUISITIONS IN THE

No. X.

Year.	Territory.	How acquired, and District now representing it.	Approximate Area.	Land Revenue.
1681-82.	Porto-Novo alias Faran- gipet.	A seaport in the district of South Arcot...	SQ. MILES. 0.78	RS. 36
1702 ..	..	(1.) Local Records, dated 12th January.—Cowle for making a settlement obtained from Haraji Raja, the Subahdar of Gingee, and the Deputy in the Carnatic of Sambaji, who had recently succeeded his father, Sivaji, as head of the Mahratta dynasty. (2.) July 2nd.—Factory entered in the "Quinque-partite Indenture of the Conveyance of the Dead Stock of the two East India Companies." (3.) Fell into the hands of the French under Lally, with Fort St. David and Cuddalore. (4.) French driven out by Colonel Coote after his defeat of Lally at Wandiwash. (5.) Taken by the French under Bussy (Wilks). (6.) 1st February.—Restored to England under treaty of Versailles, dated 3rd September 1783.		
1758 ..	..			
1760 ..	..			
1782 ..	..			
1785 ..	..			

No. XI.

1682 ..	Cuddalore, Factory of.	A seaport in South Arcot, and the chief town of that district.	1	3,643
1683 ..	..	(1.) Factory established (Local Records, 11th May 1682).		
1692 ..	..	(2.) Business commenced (Local Records, 19th March 1683).		
1702 ..	..	(3.) Ordered by the Court of Directors to be withdrawn, along with Conimere (q. v.) ³ in consequence of the grant of Tegnapatam (q. v.) ⁴ by Rám Raja (Bruce iii, 111). (4.) July 2nd.—Mentioned as existing in the "Quinque-partite Indenture of Conveyance of the Dead Stock of the two East India Companies."		

³ Vide Acq. No. XIV.⁴ Vide Acq. No. XV.

PRESIDENCY OF FORT ST. GEORGE.

No. XI—(Continued).

Year.	Territory.	How acquired, and District now representing it.	Approximate Area.	Land Revenue.
1758 ..	Cuddalore— (Continued).	(5.) Surrendered to Lally, 4th May (Orme).		
1760 ..	..	(6.) April.—Retaken by detachment under Assaf Beg, sent by Coote after his victory at Wandiwash (Orme).		
1782 ..	..	(7.) April 8th.—Capitulated to the French, assisted by the Mysoreans (Wilks).		
1785 ..	..	(8.) 1st February.—Restored to England by France under the treaty of Versailles, dated 3rd September 1783.		

No. XII.

1683 ..	Vizagapatam, Fortified Factory of.	A seaport, capital of district of that name.	Fortified Factory only.	Nil.
1689 ..	..	(1.) Supposed date of establishing settlement (being the first mention of it). The date is not given by Bruce, nor in the Local Records which go back to 1670 only. If the date is correct, the grant must have issued from the King of Golconda or his local officers.		
1690 ..	..	(2.) September 13th.—Factory seized and the English officers put to the sword by the Mogul's orders, owing to the rupture between Aurangzeb and the Company in that year.		
1692 ..	..	(3.) 28th December.—Kaul for the factory renewed by Zulfakar Khán, the Mogul General in the Deccan.		
1702 ..	..	(4.) April.—Factory allowed to be fortified by the same authority.		
1716 ..	..	(5.) Entered in the Dead Stock account taken on the union of the two East India Companies. It is there described as "the Fort and Factory at Vizagapatam."		
1757 ..	..	(6.) Farmán from the Emperor Faroksir confirming the possession of the settlement (Local Records).		
1758 ..	..	(7.) 25th June.—Captured by the French under Bussy (Orme).		
1766 ..	..	(8.) 12th September.—Presented to the English by the Raja of Vizianagram after capturing it from the French garrison (Orme).		
		(9.) August 12th.—Grant confirmed by the Mogul's farmán.		

No. XIII.

Year.	Territory.	How acquired, and District now representing it.	Approximate Area.	Land Revenue.
1683-84.	Tellicherry ..	Town and seaport in Malabar	Fortified Factory only.	Nil.
1688-89.	..	(1.) Factory established under a Chief and Factors by the President of Surat (Bruce ii, 511); being the first Pepper settlement on the Malabar Coast.		
1702 ..	..	(2.) Factory strengthened (Bruce ii, 616).		
1708 ..	..	(3.) Entered in the Dead Stock list of two East India Companies as the "Fort of Tellicherry."		
1719 ..	..	(4.) Formal grant obtained for the Fort from the Cherakal Raja (Malabar Commission Report, para. 9).		
1776 ..	..	(5.) Limits of settlement extended on south side after a successful war with the Coringotte Nair (idem).	SQ. MILES. 1½	RS. 1,490
1780 ..	..	(6.) The settlement reduced from a Chiefship to a Residency.		
1782 ..	..	(7.) Besieged by Sirdar Khán, Hyder's Faujdar, with the Cherakal Raja.		
1784 ..	..	(8.) Successful sortie under Major Abingdon, and the siege raised (Malabar Commission Report, para. 30).		
1794 ..	..	(9.) The Chiefship re-established.		
		(10.) Chiefship abolished, and the settlement placed directly under the Supervisor of Malabar.		

No. XIV.

1682 ..	Conimere alias Kunimédu.	On the coast, South Arcot District, 10 miles north of Pondicherry.	Factory only.	
1688 ..	..	(1.) Factory established (Bruce ii, 519).		
		(2.) Farman for a fortified settlement and liberty of trade, obtained on a present of 800 pagodas or Rupees 3,200, from Rám Raja, who, on the assassination of his elder brother Sambaji (Sivaji's successor) by Aurangzeb, and the simultaneous captivity of Sahoji, Sambaji's son, had been recognised as head of the Mahratta dynasty by its subjects (Bruce ii, 652).		
1691 ..	..	(3.) Withdrawn by order of the Court of Directors, on the purchase of Tegnapatam (Fort St. David), (Bruce iii, 111). (Vide Acq. No. XV).		

No. XIV—(Continued).

Year.	Territory.	How acquired, and District now representing it.	Approximate Area.	Land Revenue.
1801 ..	Conimere— (Continued).	(4.) Ceded with the rest of the Subah of Arcot to the Company by treaty with Azim-ul-Daula, Nawáb Subahdar of the Carnatic, 31st July (Aitchison, vol. v, 248). Vide Acq. No. XLIII).		

No. XV.

1690 ..	Tegnapatam ..	(alias Fort St. David), sometimes written Thovanapatnam, Devenapatnam, Devanampatnam, Devipatnam, now included in Cuddalore, the chief town of the South Arcot District.	SQ. MILES. 10	RS. 11,130
1702 ..	..	(1.) September 1st.—The grant of land for this settlement was purchased for 120,000 chakrams = 8,000 pagodas = 32,000 rupees from Rám Raja, who, on the assassination of his elder brother Sambaji (Sivaji's successor) by Aurangzeb, and the simultaneous captivity of Sahoji, Sambaji's son, had been recognised as the head of the Mahratta dynasty by its subjects (Local Records).		
1702 ..	..	(2.) July 2nd.—Mentioned in the "Quinqu-partite Indenture of Conveyance of the Dead Stock of the two East India Companies" as "all that fort called Fort St. David (being a strong fort and factory) and about three miles compass of the circumjacent country, upon which several small towns or villages are erected."		
1758 ..	..	(3.) June 2nd.—Surrendered to the French under Lally, who at once razed all the fortifications to the ground (Orme). It was afterwards included in Cuddalore (q.v.) [*] and its dependencies, instead of being shown under a separate head.		

No. XVI.

1690 ..	The villages of Tondiyárpét, Purasavákam and Egmore.	Parwána from Asad Khán, Aurangzeb's Grand Vizier, granting the English the three towns, now included in the city of Madras, of Tondiyárpét, Purasavákam, and Egmore properly Elambúr, 10th February (Local Records).	8-8	20,861
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^{*} Vide Acq. No. xi.

No. XVI—(Continued).

Year.	Territory.	How acquired, and District now representing it.	Approximate Area.	Land Revenue.
1746 ..	The villages of Tondiyarpét, Purasavakam, and Egmore— (Continued).	(2.) September 10th.—Surrendered, as part of the city of Madras, to the French arms under Labourdonnais. Ransom fixed by him at 11 lakhs of pagodas (44 lakhs of rupees or 440,000 pounds sterling); but the stipulation disregarded by Dupleix (Orme).	SQ. MILES. 8·8	RS. 20,861
1749 ..	..	(3.) August 15th.—Delivered up, as part of the city of Madras, by the French under the operation of the treaty of Aix la Chapelle, dated October 7th, 1748 (Orme).		
1765 ..	..	(4.) August 12th.—Original grant confirmed by a farmán from the Mogul.		

No. XVII.

1694-95.	Anjengo ..	A small seaport on the Travancore Coast 78 miles N.N.W. of Cape Comorin; now attached to the Malabar Collectorate.	½	891
1695-96.	..	(1.) Settlement formed by grant of the Queen of Attinga, a Princess under the sovereignty of Travancore (Bruce III, 165) on payment of ground-rent.		
1702 ..	..	(2.) Fort built (Bruce III, 195).		
	..	(3.) Fort entered in the "Quinque-partite Indenture of Conveyance of the Dead Stock of the two East India Companies," dated 2nd July.		

No. XVIII.

1708 ..	The villages of Vyásarpádi and Nungambákam.	(1.) September 25th.—Parwána from Dawúd Khán, Nawáb or Faujdar of the Carnatic portion of the Golconda Subah, granting to the English the towns of Vyásarpádi and Nungambákam, now included in the city of Madras (Local Records).	3·2	5,868
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No. XVIII—(Continued).

Year.	Territory.	How acquired, and District now representing it.	Approximate Area.	Land Revenue.
1713 ..	The villages of Vyásarpádi and Nungambákam— (Continued).	(2.) October.—The towns mentioned under (1) resumed by Nawáb Sádát ulla Khán (Local Records).	SQ. MILES. 3·2	RS. 5,868
1716 ..	..	(3.) January 5th.—Farmán from the Emperor Faroksir, reciting the usurpation mentioned under (2) and cancelling it with confirmation of the grant (Local Records).		
1746 ..	..	(4.) September 10th.—Surrendered, as part of the city of Madras, to the French arms under Labourdonnais.		
1749 ..	..	(5.) August 15th.—Delivered up, as part of the city of Madras, by the French under the operation of the treaty of Aix la Chapelle, dated 7th October 1748 (Orme).		
1765 ..	..	(6.) Old grants confirmed by farmán of the Mogul.		

No. XIX.

1708 ..	Tiruvattúr, Sattangádu, and Kattiwákam.	The last name is called by the English "Ennore." These three villages lie to the north of the city of Madras, in the Saidapet Taluk of the Chingleput District.	6½	2,444
1713 ..	..	(1.) September 25th.—Parwána from Dawúd Khán, Nawáb and Faujdar of the Carnatic portion of the Golconda Subah (Local Records).		
1716 ..	..	(2.) Resumed by Nawáb Sádát ulla Khán (Local Records).		
	..	(3.) January 5th.—Farmán from the Emperor Faroksir, reciting the usurpation just mentioned, and cancelling it, with confirmation of grant.		
1765 ..	..	(4.) August 12th.—Confirmed again by the general farmán of the Mogul.		

BRITISH ACQUISITIONS IN THE

No. XX.

Year.	Territory.	How acquired, and District now representing it.	Approximate Area.	Land Revenue.
1715 ..	Island of Chetwai.	A strip of land on the sea coast of the Malabar District insulated by the estuaries of Chetwai and Kodangalur (Cranganore), 50 miles north of Cochin. It is now part of the Ponani Taluk. Permission granted by the Zamorin to the English to build a warehouse here.	SQ. MILES. 40	RS. 38,222
1717 ..	..	Seized from the Zamorin by the Dutch who built a fort here (Malabar Commissioners' Report, paragraph 24).		
1776 ..	..	Conquered by Hyder Ali from the Dutch (<i>ibid</i>).		
1790 ..	..	Taken by Lieutenant-Colonel Hartley and leased to the Cochin Raja for Rupees 40,000 per annum. The lease is dated 26th November 1790. It was renewed in 1791 for two years, and in 1794 for ten years (Malabar Commission Report, paragraphs 164 and 520).		

No. XXI.

1722 ..	Ingeram, Factory of.	On the Godavari, 6 miles south of Coringa.	Factory only.	Nil.
1757 ..	..	(1.) June.—Factory established.		
1759 ..	..	(2.) Captured by the French under Bussy.		
1765 ..	..	(3.) 10th May.—Part of the territory ceded by Nizam's treaty with Colonel Forde (<i>vide</i> Acq. No. XXXI). (4.) August 12th.—Grant confirmed by the Mogul's farmán.		

No. XXII.

	Island of Dhar-mapatam.	Immediately to the north of the Tellicherry Factory. The Anjarakandy river splits into two branches as it approaches the sea and the land lying between them and the sea is the island in question: now in the Kottayam Taluk of the Malabar Collectorate.	SQ. MILES. 6	RS. 4,132
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No. XXII—(Continued).

Year.	Territory.	How acquired, and District now representing it.	Approximate Area.	Land Revenue.
1734-35.	Island of Dhar-mapatam— (Continued).	(1.) Ceded to English by the Cherakal, Cotiote and Cannanore Rajas (Malabar Commission Report, para. 9, and Local Records).	SQ. MILES. 6	RS. 4,132
1788 ..	..	(2.) June.—Seized by Ravi Varma, Raja of Cherakal (Malabar Commission Report, paragraph 55).		
1789 ..	..	(3.) January 3rd.—Retaken by the English (Malabar Commission Report, paragraph 65).		

No. XXIII.

1742 ..	The Villages of Vepery, Perambúr and Pudupákam.	(1.) 4th November.—Sanad from Nawáb Sádát ulla Khán, Subah of Arcot, granting by way of inám to the Company the three villages of Vepery, Perambúr and Pudupákam, now included in the city of Madras (Local Records).	SQ. MILES. 3.9	RS. 7,585
1746 ..	..	(2.) September 10th.—Surrendered, as part of the city of Madras, to the French arms under Labourdonnais.		
1749 ..	..	(3.) August 15th.—Delivered up, as part of the city of Madras, by the French under the operation of the treaty Aix la Chapelle, dated October 7th, 1748 (Orme).		
1765 ..	..	(4.) August 12th.—Original grant confirmed by farmán of the Mogul.		

No. XXIV.

1742 ..	Eranávur ⁶ and Shadayankupam.	Two villages to the south of Madras in the Saidapet Taluk of Chingleput District.	SQ. MILES. 4½	RS. 469
1765 ..	..	November 4th.—Grant from Nawáb Sádát ulla Khán, Subah of Arcot. (2.) August 12th.—Confirmed by the Mogul's farmán.		

⁶ Eranávur is held at a pepper-corn rent, on *Srotriyam* tenure.

BRITISH ACQUISITIONS IN THE

No. XXV.

Year.	Territory.	How acquired, and District now representing it.	Approximate Area.	Land Revenue.
1749 ..	The Town of St. Thomé.	(1.) 2nd October.—Farmán from Mahomed Ali (afterwards Wallajah), Nawáb of the Carnatic, granting to the English the town of Mayilápur or St. Thomé, now included in the city of Madras (Local Records); but it appears from Orme that the English immediately after the restoration (15th August 1749) of Madras by the French, under the treaty of Aix la Chapelle, took possession of St. Thomé, for fear of its falling into the hands of the French.	SQ. MILES. 4.9	RS. 13,502
1765 ..	..	(2.) August 12th.—Grant confirmed by the Mogul's farmán.		

No. XXVI.

Year.	Territory.	How acquired, and District now representing it.	Approximate Area.	Land Revenue.
1749 ..	Devikóta ..	A town in the Tanjore District, near the junction of the Coleroon with the sea, 37 miles south of Pondicherry.	SQ. MILES. 16	RS. 28,905
1751 ..	..	(1.) Town and fort captured by Major Lawrence in a war between the English and Pratáp Singh, Raja of Tanjore; commenced by the former with a view to the restoration of Sahoji to the throne of that kingdom; but continued after it became known that Sahoji was unacceptable to the Tanjorines—on their own account, with a view "of making some acquisitions to compensate the expenses which had already been incurred" (Orme).		
1758 ..	..	(2.) January 1st.—Ceded, with 31 surrounding villages, to the English by Raja Pratáp Singh, on condition of his receiving Military aid whenever required: land revenue 9,000 pagodas (Local Records).		
1760 ..	..	(3.) June 4th.—Fortress abandoned by the English garrison on the fall of Fort St. David to Lally and the approach of a large French force (Orme).		
		(4.) February.—Evacuated by the French; after Coote's victory at Wandewash, and regarrisoned by the English (Orme).		

No. XXVII.

Year.	Territory.	How acquired, and District now representing it.	Approximate Area.	Land Revenue.
1750 ..	Trevendapur.	In the district of South Arcot, 28 villages, rated at 26,250 chakrams.	SQ. MILES. 55	RS. 58,050
..	..	February.—Granted by the Nawáb of Arcot to the Company in Jágir (Local Records).		
		August 12th.—Farmán from the Mogul confirming the above grant by way of inám or free gift.		

No. XXVIII.

Year.	Territory.	How acquired, and District now representing it.	Approximate Area.	Land Revenue.
1750 ..	Poonamallee District.	Consisting of 231 villages, in the district of Chingleput.	SQ. MILES. 330	RS. 2½ lakhs.
1765 ..	..	26th September.—Granted in Jágir to the Company by Mahomed Ali (afterwards Wallajah), Nawáb of Arcot, who then styled himself by his deceased father's name, Anwar-ud-din Khán. Revenue (with customs) 34,840 pagodas (Local Records).		
		(2.) August 12th.—Confirmed by way of inám or free gift by a Sanad from the Mogul.		

No. XXIX.

Year.	Territory.	How acquired, and District now representing it.	Approximate Area.	Land Revenue.
	Bandermalanka and Nilapalli, Factories of	A seaport, Godávári District, west of Narsapur near Ingeram (<i>vide</i> Acq. No. XXI).	Factories only.	Nil.
1751 ..	..	(1.) November.—Both factories established.		
1757 ..	..	(2.) Both taken by Bussy.		
1759 ..	..	(3.) 14th May.—Part of the territory ceded by Nizam's treaty with Colonel Forde (<i>vide</i> Acq. No. XXXI).		
1765 ..	..	(4.) August 12th.—Grant confirmed by the Mogul's farmán.		

BRITISH ACQUISITIONS IN THE

No. XXX.

Year.	Territory.	How acquired, and District now representing it.	Approximate Area.	Land Revenue.
	Mount Billy, Fort of.	Is a detached hill, 855 feet in height, on the Malabar Coast forming a prominent land mark in the charts; forms part of Cherakal Taluk.	SQ. MILES. A few acres.	RS.
1754 ..	..	A fort was first built here on a bluff projecting into the sea by the Portuguese, from whom the Dutch took it.		
1761 ..	..	February 24th.—The French acquired it by purchase from the Cherakal Raja.		
1779 ..	..	The small French garrison massacred by Ali Raja of Cannanore who was obliged to deliver it up to the English as per terms of the capitulation of Mahé, dated 10th February 1761.		
1784 ..	..	Taken by Sirdar Khán, Tippoo's General.		
		Restored to the English by the treaty of Mangalore, dated 11th March 1784.		

No. XXXI.

1759 ..	Districts ceded by the Nizam. The Circar of Masulipatam, with eight districts, the Circar of Nizampatam, and the districts of Kondavid and Akulamannád.	(1.) 14th May.—Given to the English Company "as an inám or free gift" by the Nizam, Salábat Jang, in treaty with Colonel Forde. The small Circar of Masulipatam is not to be confounded, as it often is, with the extensive district afterwards so called. The whole territory ceded by the foregoing treaty is about 700 square miles only in extent, and with the exception of the towns mentioned under head (VI) <i>infra</i> —which now belong to the Godáviri District—is a portion of the present Kistna Collee-torate, viz.:— (I.) The Circar of Bunder, or seaports of Masulipatam, divided into eight districts	SQ. MILES. 700	RS. 3,50,000
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No. XXXI—(Continued).

Year.	Territory.	How acquired, and District now representing it.	Approximate Area.	Land Revenue.
	Districts ceded by the Nizam —(Continued).	or Mehals, forming a semi-circle from 2 to 20 coss round the fort:— 1. The Havéli, or home grounds and gardens of 12 pettahs or suburbs with their six circumjacent pálems or petty zemindaries, and the salt pans. 2. Divi, with six lesser islands. 3. Málúr. 4. Inugudúru. 5. Pedana. 6. Tummidi. 7. Bondára. 8. Narsapur. (II.) The Circar of Nizampatam sub-divided into 36 Mehals lying south of the Kistna, on the coast, about 20 coss from Masulipatam. It extended 60 miles south from Point Divi and averaged 5 miles in breadth. (III.) Kondavid (<i>alias</i> Guntúr) a large pargana (not to be confounded with the large district of same name), two coss west of Masulipatam, containing fifty-two villages. (IV.) Akulamannád of fifty-two villages. (V.) Tundúru. (VI.) The towns and dependencies of Nilapalli, Bendamurlanka, Sakhinéte-palli, Ramesvaram, Gonganapalli, Antarvedhi, on the coast, on different branches of the Godáviri river. (2.) August 12th.—Grant confirmed by the Mogul's farmán.	SQ. MILES. 700	RS. 3,50,000
1765 ..	..			

No. XXXII.

1763 ..	Chingleput District, greater portion of.	(1.) October 16th.—On this date the Nawáb of the Carnatic by 17 Sanads "in consideration of the great services rendered to his affairs by the Company, their firm friendship for him, and his dependence on their future alliance" gives and makes over to them in Jágir,	SQ. MILES. 2,284	RS. 15½ lakhs.
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No. XXXII—(Continued).

Year.	Territory.	How acquired, and District now representing it.	Approximate Area.	Land Revenue.
	Chingleput District— (Continued).		SQ. MILES.	RS.
		exclusive of subsidiary Srotiyams and Ináms, and exclusive also of the forts of Chingleput, Tripassore, Carangoly, Alamparva, and of the mints at Alamparva and Covelong; 1,759 villages belonging to 17 parganas which are now included in the Madras District of Chingleput.	2,284	15½ lakhs.
1765 ..	..	(2.) October 29th.—Reciting similar grounds, gives a similar Sanad for 175 villages which in the Sanads of 16th idem were not reckoned as belonging to the parganas granted, but which his Sarishtadar has reminded him appertain to the same.		
1801 ..	..	(3.) August 12th.—Farmán from the Mogul confirming these grants by way of inám or free gift.		
		(4.) 31st July.—The items reserved in the grant of 16th October 1763 were ceded with the rest of the Subah of Arcot to the Company by treaty with Azim-úl Daula, Nawáb Subahdar of the Carnatic (<i>vide</i> Acq. No. XLIII).		

No. XXXIII.

Year.	Territory.	How acquired, and District now representing it.	Approximate Area.	Land Revenue.
	Randatarra ..		SQ. MILES.	RS.
1741 ..	..	Formerly was a small taluk in North Malabar lying between Cannanore and Dharmapatam Island; it is now comprised in the Cherakal Taluk of the Malabar Collectorate.	24	20,515
1749 ..	..	(1.) Mortgaged by the Achimars or Chiefs to the Company for 60,000 silver fanams, equal to 12,000 rupees.		
1765 ..	..	(2.) The debt increased to 80,000 fanams.		
		(3.) 23rd March.—Ceded to the Chief of Tellicherry by Ravi Varma, Regent of the Cherakal Ráj (Malabar Commission Report, paragraph 26).		
1779 ..	..	(4.) Reduced by the Rajas of Cherakal and Cartinád under the requisition of Hyder Ali (Municipal Commission Report, paragraph 30).		

No. XXXIII—(Continued).

Year.	Territory.	How acquired, and District now representing it.	Approximate Area.	Land Revenue.
			SQ. MILES.	RS.
1782 ..	..	(5.) Reoccupied by the Chief of Tellicherry (paragraph 44).		
1786 ..	..	(6.) Seized again by the Raja of Cherakal (paragraphs 45 and 46).		
	..	(7.) Fell to the Company with rest of Malabar under the Treaty, dated 18th March 1792, with Tippoo, ⁷ and placed by the Bombay Commissioners under the direct collection of the Company's Government (Malabar Commission Report, paragraph 85).		

No. XXXIV.

Year.	Territory.	How acquired, and District now representing it.	Approximate Area.	Land Revenue.
			SQ. MILES.	RS.
1768 ..	The Circars of Chicacole, Rajahmundry, Ellore, Mustafanagar, and Murtizanagar.	26th February.—On this date there were ceded by the Nizam in treaty with the Government of Fort St. George, subject to an annual payment (since commuted) of 7 lakhs of rupees, the Circars of (1) Murtizanagar <i>alias</i> Guntúr <i>alias</i> Kondavidu; (2) Mustafanagar <i>alias</i> Kondapilli; (3) Ellore; (4) Rajahmundry; (5) Chicacole <i>alias</i> Kalinga. This cession, together with the cession of 14th May 1759 (<i>vide</i> Acquisition No. XXXI) and the taluks of Bhadrachalam and Rákapalli (<i>vide</i> Acquisition No. XLVIII) comprises the whole of what is now known as the "Northern Circars" or the four extensive Madras Districts of Ganjam, Vizagapatam, Godáviri, and Kistna: the two last mentioned having been formed out of the three old districts styled Rajahmundry, Guntúr, and Masulipatam in 1859.	40,217	106,00,000

NOTE.—The above date, 26th February 1768, is generally reckoned as that of the actual cession of these territories, and was so recognised by law—*vide* Section II (late) Madras Regulation XXXI, 1802: and rightly so, because the Sanad of the Mogul Emperor, dated 12th August 1765, assigning this territory to his Sepoy Sirdars, the

⁷ *Vide* Acq. No. XXXVIII.

BRITISH ACQUISITIONS IN THE

No. XXXIV—(Continued).

Year.	Territory.	How acquired, and District now representing it.	Approximate Area.	Land Revenue.
	The Circars of Chicacole, Rajahmundry, Ellore, Mustafanagar, and Murtizanagar—(Continued).	English Company, by way of inám or free gift; and the treaty with the Nizam of 12th November 1766, by which he ceded the same provinces, had no substantial operation. In regard to the Circar of Murtizanagar, the Government of Fort St. George agreed, out of friendship for the Nizam, to permit his brother, Bazalut Jang, to enjoy it as a Jágir for life. The tenant died on the 5th October 1782; and, some difficulties delaying prompt action on the part of the Company, the Nizam's Amildars retained the country till a formal Sanad for its being delivered up was procured by Lord Cornwallis on the 18th September 1788.	SQ. MILES. 40,217	RS. 106,00,000

No. XXXV.

1778 ..	Nagore ..	A seaport in the district of Tanjore, 14 miles south of Tranquebar, and a few miles north of Negapatam, with the small island belonging to it and eight magans comprising 277 villages. June 17th.—Granted to the Company by the Raja of Tanjore in consideration of services rendered (i.e., his restoration to his throne from which he had been expelled by the Nawáb of Arcot) and in hope of future protection. (Aitchison V, page 268).	112	2,19,077
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No. XXXVI.

	Sadras ..	A seaport in the Chingleput District, 42 miles south of Madras, containing a fort and factory and having subordinate villages attached to it.	5	950
	Bimlipatam ..	A seaport in the Vizagapatam District, 12 miles north of the town of Vizagapatam, where the Dutch possessed a fortified factory with a bleaching ground.	Factory premises only.	Nil.

PRESIDENCY OF FORT ST. GEORGE.

No. XXXVI—(Continued).

Year.	Territory.	How acquired, and District now representing it.	Approximate Area.	
	Jagannathpura.	A suburb of Cocanada, the chief town of the Godávari District; here the Dutch had a factory with the following dependencies, viz., the village of Gollapálem, the ground at Gundávaram, and the factory at Dráksháramam.	ACRES. 182	RS. 1,336
	Palicole ..	A town 6 miles from Narsapur, Godávari District, with its dependent village, Kontéra, and a piece of ground at Narsapur. ⁸	SQ. MILES. 5	10,166
	Porto Novo Factory.	The Dutch Factory house and the bleaching place called Wannárpálaiyam.	Factory premises only.	Nil.
	Tuticorin ..	(A seaport in Tinnevely District).—The fort ⁹ and city of Tuticorin with its nine subordinate Commercial Lodges, viz., at Alwar Tinnevely, Koilpabam, Shaindmangalam, Munnappar, Permakoil, the Island of Alandale, the Island of Freshwater, Kilkarai (in the Madura District), and Cape Comorin.	SQ. MILES. 3 1/2	286
1781 ..	..	(1.) The foregoing six Dutch Settlements (together with Pulicat and Negapatam) ¹⁰ were taken by the English in this year in Lord Macartney's Governorship (Local Records).		
1785 ..	..	(2.) July.—All six restored to Holland under treaty with the States General of 20th May 1784 (Local Records).		
1795 ..	..	(3.) All six surrendered to the English on war again breaking out. Lord Hobart was Governor of Madras at this period (Local Records).		
1818 ..	..	(4.) 31st March.—All six restored to Holland agreeably to the Convention of the Allied Powers in 1814 (Local Records).		
1825 ..	..	(5.) 1st June.—All six ceded to Great Britain under the treaty of March 1824 (Local Records).		

⁸ The ground at Narsapur on which the Dutch Factory stood was washed away by the Godávari river many years ago.

⁹ The fort at Tuticorin is exactly 3.29 acres in extent; the rest is the Dutch city surrounding it north, south, and west.

¹⁰ Vide Acq. Nos. II and XXXVII.

BRITISH ACQUISITIONS IN THE

No. XXXVII.

Year.	Territory.	How acquired, and District now representing it.	Approximate Area.	Land Revenue.
1781 ..	Negapatam ..	A seaport in the District of Tanjore, and the terminus of the South Indian Railway. (1.) 12th November.—This, the Chief Settlement on the Coromandel Coast of the Dutch, who took it from the Portuguese in 1660, capitulated, after nine days' siege, to Sir Hector Munro, whose small army was reinforced by seamen and marines landed from the fleet under Sir Edward Hughes. This achievement was initiated by the Governor of Madras Lord Macartney (Wilks).	SQ. MILES. 1½	RS. 832
1784 ..	..	(2.) On the 20th May peace was signed between England and the States General of the United Provinces on the basis of a mutual restitution of places captured by the arms of either during the late war—Negapatam was excepted; England agreeing, however, to treat with the States General for its restitution in case the States should ever have an equivalent to offer. Nothing further was done, and the place has remained an English possession.		

No. XXXVIII.

1792 ..	Districts ceded by Tippoo Sultan under the Treaty of Seringapatam.	By treaty, ¹¹ dated 17th March, there were ceded and incorporated with the Madras Presidency (1) the whole of present district of Malabar, except Cochin and Wainád; (2) the Dindigul and Pulney Taluks of the present Madura District; (3) the whole of the present Salem District except what is comprised in the present Oosoor taluk; and (4) one taluk (Kangundi) of present North Arcot District.	13,789	44,06,000
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¹¹ By this treaty the Coorg Raja became subordinate to the Company instead of to Tippoo. He agreed to pay the Company 8,000 pagodas = 32,000 rupees. Coorg became British territory in 1834, but has not been incorporated with the adjoining Presidency of Madras.

PRESIDENCY OF FORT ST. GEORGE.

No. XXXIX.

Year.	Territory.	How acquired, and District now representing it.	Approximate Area.	Land Revenue.
1795 ..	Cochin, City of.	October 19th.—Surrendered to the force sent against it by the Governor of Madras, Lord Hobart. Attached since 1802 to Malabar Collectorate.	SQ. MILES. 3	RS. 11,282
1814 ..	..	Finally ceded to the British Government by treaty at the time when the other Dutch Indian Settlements, captured the same year, were restored to Holland.		

No. XL.

1795 ..	Tangacherry..	Adjoins Quilon, in the Travancore country, on the west: a Portuguese possession from 1555 to 1665, then captured by the Dutch. The fort is built on a headland of laterite, jutting into the sea, the length about 2½ furlongs east and west, and mean breadth 1 furlong. Land-tax 185 rupees. Add land-tax of four patoms or gardens belonging to the settlement, Rupees 237. This territory came under the English Government on the capture of Cochin in this year (Local Records), and, like that city, is attached to the Malabar Collectorate.	¾th	422
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No. XLI.

1799 ..	Districts acquired by the Partition Treaty of Mysore.	July 13th.—Partition Treaty of Mysore between the English, the Nizam, and the Peshwa for the adjustment of the territories of the late Tippoo Sultan. The districts acquired by the English and now incorporated in the Madras Presidency are—(1) South Canara, (2) Coimbatore, (3) the Nilgiri Hills except South-East Wainád lately added to that district, (4) so much of the Salem District as is contained in the taluk of Hosúr (Oosoor), (5) the Venkatagiri Kóta Taluk of North Arcot, and (6) a portion (one-third) of the Punganúr Taluk of North Arcot.	13,000	42,00,000
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No. XLII.

Year.	Territory.	How acquired, and District now representing it.	Approximate Area.	Land Revenue.
1799 ..	The District of Tanjore. Greater portion of.	Excepting former grants (<i>vide</i> ¹² Devikota and Nagore and the Fort of Tanjore and the settlements of other European nations). 25th October.—Treaty between Serfoji and the Company.	sq. MILES. 3,513	RS. 41,41,203

No. XLIII.

1800 ..	All the territories acquired by the Nizam under the treaty of Seringapatam (1792) and all the territories acquired by him under the treaty of Mysore (1799), except any districts situate to the north of the river Tungabhadra, in lieu of which the Nizam ceded the district of Adoni and all other his territory to the south of that river or to the south of the Kistna below the junction of these two rivers.	Ceded by the Nizam in perpetuity by treaty dated 12th October "for the regular payment of the expense of the augmented subsidiary force." The districts now representing this cession are Bellary (except the feudatory Native State of Sandūr, <i>vide</i> Acq. No. XLV), Cuddapah, the feudatory Native State of Banganapalli and Kurnool. ¹³ The expression not unfrequently used in official correspondence of "the Ceded Districts and Kurnool" as if Bellary and Cuddapah were ceded to the British Government at one time, and Kurnool at another, is erroneous.	26,592	57,50,000
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¹² Acq. Nos. XXVI, XXXV, and XLVIII.
¹³ The district of Kurnool yielded to the Nizam and afterwards (up to 1839) to the British Government a land revenue of Pagodas 66,666, or Rupees 2,44,431 only (subsequently reduced to 1,00,000 rupees), being the peshkash payable by the hereditary Pathān Nawābs of Kurnool.

In 1839, the Nawāb was deposed and the country brought under direct administration. Subsequently the district has been enlarged by the addition of taluks taken from Bellary and Cuddapah.

No. XLIV.

Year.	Territory.	How acquired, and District now representing it.	Approximate Area.	Land Revenue.
1801 ..	The Carnatic below Ghauts, Greater portion of	The whole of the Carnatic, Payen Ghaut, not included in previous grants: viz., the present Nellore District, North Arcot (except Kangundi and Punganūr), South Arcot (except previous grants), Trichinopoly, Madura (except Dindigul and Pulney Taluks) and Tinnevely; also the feudatory State of Pudukōta. July 31st.—Ceded to the Company by His Highness Azim-ūl Daula, Nawāb Subahdar of the Carnatic (Aitchison v. 248).	sq. MILES. 35,732	RS. 145,50,000

No. XLV.

1803 ..	Districts ceded by Rajah of Mysore.	December 29th.—Supplementary Treaty of 1803 with Mysore (Aitchison, vol. v, pp. 166–67). Under this treaty the Company, while ceding certain taluks to Mysore, obtained an equivalent cession, the whole of which is now incorporated with the Madras Presidency, except the taluk called "Era Saver Seemy" (properly <i>Elusdevirastime</i>), which in 1804 was transferred to, and now forms part of, Coorg, viz.:— Uddantapuram .. Bellary District. Two-thirds of North Arcot. Punganūr. Wainād Part in Malabar, part in Nilgiris. Hulhul, or Hullial, in North Canara which now belongs to the Bombay Presidency. Part (not Port, as given by Aitchison) of Gudikota } Bellary.	1,715	1,92,000
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No. XLVI.

Year.	Territory.	How acquired, and District now representing it.	Approximate Area.	Land Revenue.
1818 ..	Sandár. Feudatory State of.	Fell under the paramount sovereignty of the British Government, with the rest of the territories dependent on the Poona Government, on the surrender of Bajeeerow, Peshwa.	SQ. MILES. 140	RS. Free from tribute.

No. XLVII.

1845 ..	Tranquebar ..	A seaport in the District of Tanjore, held by the Danes of the Raja of Tanjore at an annual rent of 4,000 rupees. Transferred to the East India Company by the King of Denmark, with all other Danish Settlements in India, for the sum of 12,50,000 rupees. Treaty done at Calcutta, 22nd February, and ratified by the Court of Directors of the East India Company at London, 2nd July.	13	15,756
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No. XLVIII.

1856 ..	The Fort of Tanjore.	October 18th.—Taken possession of by the Company twelve months from the death of Raja Sivaji, without male heirs, direct or collateral.	ACRES. 530	RS. A. P. 7 2 0
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No. XLIX.

1860 ..	Bhadrachalam and Ráká-palli. Taluks of.	Ceded by the Nizam by the 8th Article of the Treaty, dated 26th December 1860. Now attached to the Godáviri District of Madras Presidency.	SQ. MILES. 873	RS. 17,450
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II.—GOVERNORS OF FORT ST. GEORGE.

Names.	Landed in Madras.	Assumed Charge of Office.	Made over Charge.	Embarked for England.	Remarks.
Mr. Aaron Baker ..	.....	..... 1652	.....	.....	Mr. Baker was at first "Agent" for the Settlement of Madras, which was under the jurisdiction of the Presidency of Bantam in Java, from its foundation in 1639 till it was itself created a Presidency in 1653. In 1658 the Settlements in Bengal were subordinated to Madras, and so remained to 1681.
Sir Thomas Chamber .. Sir Edward Winter .. Mr. George Foxcroft ..	 June 1665	 1659 1661 Aug. 22, 1668	 Aug. 22, 1668 1670	 Jan. 19, 1672 1670	Three months after his arrival with a commission to supersede Sir E. Winter, Mr. Foxcroft was on a charge of disloyalty put into confinement by Sir E. Winter, who resumed office and retained it till the 23rd August 1668, when Mr. Foxcroft was released and re-instated by the Commission sent from England.
Sir William Langhorn, Bart. Mr. Streynsham Master. Mr. William Gyfford ..	 July 7, 1678 July 3, 1681	 1670 Jan. 27, 1678 July 3, 1681	Jan. 27, 1678 July 3, 1681 July 25, 1687	Jan. 27, 1678	By the Company's Commission, dated 14th November 1681, received 17th July 1682, the Bengal Agency was made a Government "without any subordination to Fort St. George."
Mr. Elihu Yale ..	June 23, 1672	July 25, 1687	Oct. 3, 1692	.....	Mr. Yale also acted during Mr. Gyfford's absence in Bengal from 8th August 1684 to 26th January 1685.
Mr. Nathaniel Higginson. Mr. Thomas Pitt .. Mr. Gulston Addison ..	March 19, 1684 July 7, 1698	Oct. 3, 1692 July 7, 1698 Sept. 18, 1709	July 7, 1698 Sept. 18, 1709	Feb. 25, 1700 Oct. 26, 1709	Died at Madras on the 17th October 1709.

Names.	Landed in Madras.	Assumed Charge of Office.	Made over Charge.	Embarked for England.	Remarks.
Mr. Edmund Montague.	.....	Oct. 17, 1709	Nov. 3, 1709	.....	Acting Governor.
Mr. William Frazer	May 31, 1685	Nov. 3, 1709	July 11, 1711	.....	Acting Governor.
Mr. Edward Harrison	July 11, 1711	July 11, 1711	Jan. 8, 1717	Jan. 8, 1717	Acting Governor.
Mr. Joseph Collet	Aug. 28, 1716	Jan. 8, 1717	Jan. 18, 1720	Jan. 18, 1720	Acting Governor.
Mr. Francis Hastings	July 16, 1701	Jan. 18, 1720	Oct. 15, 1721	.....	Acting Governor.
Mr. Nathaniel Elwick	Feb. 25, 1719	Oct. 15, 1721	Jan. 15, 1725	Jan. 17, 1725	Acting Governor.
Mr. James Macrae	Aug. 30, 1724	Jan. 15, 1725	May 14, 1730	Jan. 21, 1731	Acting Governor.
Mr. George Morton Pitt	Dec. 26, 1724	May 14, 1730	Jan. 23, 1735	Jan. 23, 1735	Acting Governor.
Mr. Richard Benyon	June 28, 1733	Jan. 23, 1735	Jan. 17, 1744	Jan. 17, 1744	Acting Governor.
Mr. Nicholas Morse	June 25, 1718	Jan. 17, 1744	.....	.....	Acting Governor.
Mr. John Hinde	.....	.....	.....	.....	Madras having been captured by the French on the 10th September 1746, the government of the Settlements on the Coast devolved on Mr. John Hinde, the Deputy Governor of Fort St. David.
Mr. Charles Floyer	.....	April 16, 1747	.....	.....	Mr. Hinde died at Fort St. David on the 14th April 1747 previous to the receipt of the Court of Directors' Despatch of 24th January 1747 creating Fort St. David the Chief Settlement and appointing Mr. Hinde President and Governor.
Mr. Thomas Saunders	July 14, 1732	Sept. 19, 1750	Jan. 14, 1755	Jan. 14, 1755	The Court's Despatch ordering Mr. Floyer's dismissal from the service was received at Fort St. David on the 6th July 1750.
George Pigot	July 26, 1737	Jan. 14, 1755	Nov. 14, 1763	Nov. 14, 1763	The seat of Government was re-established at Madras on the 6th April 1752, four years after its restoration to the English by the treaty of Aix-la-Chapelle.
Mr. Robert Palk	Oct. 2, 1761	Nov. 14, 1763	Jan. 25, 1767	Jan. 25, 1767	
Mr. Charles Bouchier.	Dec. 30, 1741	Jan. 25, 1767	Jan. 31, 1770	Feb. 9, 1770	
Mr. Josias DuPre	June 10, 1762	Jan. 31, 1770	Feb. 2, 1773	Feb. 2, 1773	
Alexander Wynch.	July 12, 1768	Feb. 2, 1773	Dec. 11, 1775	Feb. 15, 1776	

Names.	Landed in Madras.	Assumed Charge of Office.	Made over Charge.	Embarked for England.	Remarks.
Lord Pigot	Dec. 9, 1775	Dec. 11, 1775	.....	.....	Governor for the second time. By order of Mr. George Stratton and the majority of Council he was placed under arrest and detained at St. Thomas' Mount on the 24th August 1776. He was allowed to return to the Madras Garden House on the 28th April on change of air, and died there on the 10th May 1777.
Mr. George Stratton	June 17, 1751	Aug. 23, 1776	Aug. 31, 1777	.....	Suspended from the service.
Mr. John Whitehill	Aug. 31, 1777	Aug. 31, 1777	Feb. 8, 1778	.....	Acting Governor.
Sir Thomas Rumbold	Feb. 8, 1778	Feb. 8, 1778	April 8, 1780	April 6, 1780	Acting Governor for the second time. Suspended by the Governor-General and Council under Section IX of the Regulating Act.
Mr. John Whitehill	Aug. 31, 1777	April 8, 1780	Nov. 8, 1780	.....	Acting Governor.
Mr. Charles Smith	July 11, 1763	Nov. 8, 1780	June 22, 1781	.....	Acting Governor.
Lord Macartney	June 22, 1781	June 22, 1781	June 8, 1785	.....	Embarked for the Northern Ports and Bengal on the 4th June 1785, and resigned from Visagapatam by letter.
Mr. Alexander Davidson	Sept. 8, 1760	June 18, 1785	April 6, 1786	.....	Acting Governor.
Sir Archibald Campbell, K.B.	April 6, 1786	April 6, 1786	Feb. 7, 1789	Feb. 7, 1789	Acting Governor.
Mr. John Holland	July 26, 1780	Feb. 7, 1789	Feb. 13, 1790	Feb. 13, 1790	Acting Governor.
Mr. Edward Holland	June 5, 1788	Feb. 13, 1790	Feb. 20, 1790	.....	Acting Governor.
Major-General William Meadows	Feb. 20, 1790	Feb. 20, 1790	Aug. 1, 1792	Aug. 1, 1792	
Sir Charles Oakeley, Bart.	Oct. 15, 1790	Aug. 1, 1792	Sept. 7, 1794	Sept. 29, 1794	
Lord Hobart	Sept. 7, 1794	Sept. 7, 1794	Feb. 20, 1798	Feb. 20, 1798	Acting Governor.
Lieut.-General George Harris, Commander-in-Chief.	March 1797	Feb. 21, 1798	Aug. 21, 1798	.....	
Lord Clive	Aug. 21, 1798	Aug. 21, 1798	Aug. 30, 1803	Sept. 12, 1803	
Lord William Bentinck	Aug. 30, 1803	Aug. 30, 1803	Sept. 11, 1807	Sept. 27, 1807	Acting Governor.
Mr. William Petrie	Jan. 23, 1765	Sept. 11, 1807	Dec. 24, 1807	.....	
Sir George Hilario Barlow, Bart., K.B.	Dec. 24, 1807	Dec. 24, 1807	May 21, 1813	Aug. 26, 1813	
Lieut.-General The Hon. John Abercromby.	March 6, 1813	May 21, 1813	Sept. 16, 1814	Oct. 2, 1814	Came out as Commander-in-Chief and temporary Governor.
The Right Hon. Hugh Elliot.	Sept. 16, 1814	Sept. 16, 1814	June 10, 1820	June 26, 1820	
Sir Thomas Munro, Bart., K.C.B.	June 10, 1820	June 10, 1820	.....	.....	Died at Pattikonda in the Bellary District on the 6th July 1827.

Names.	Landed in Madras.	Assumed Charge of Office.	Made over Charge.	Embarked for England.	Remarks.
Mr. Henry Sullivan Gramsc.	Feb. 3, 1798	July 10, 1827	Oct. 18, 1827	.....	Acting Governor.
Mr. Stephen Rumbold Lushington.	Oct. 18, 1827	Oct. 18, 1827	Oct. 25, 1832	Oct. 28, 1832	
Mr. Frederick Adam, K.C.B.	Oct. 25, 1832	Oct. 25, 1832	March 4, 1837	March 4, 1837	
Mr. George Edward Russell.	Aug. 29, 1803	March 4, 1837	March 6, 1837	.....	Acting Governor.
Lord Bhipinstone, G.C.B.	March 6, 1837	March 6, 1837	Sept. 24, 1842	.....	Left the Presidency on the 29th September 1842 for Bangalore and Nilgiri Hills en route to Europe.
Marquis of Tweeddale, K.T. and C.B.	Sept. 24, 1842	Sept. 24, 1842	Feb. 23, 1848	Feb. 23, 1848	Was also Commander-in-Chief.
Mr. Henry Dickinson.	July 5, 1809	Feb. 23, 1848	April 7, 1848	.....	Acting Governor.
Mr. Henry Pottinger, Bart., G.C.B.	April 7, 1848	April 7, 1848	April 24, 1854	April 24, 1854	
Mr. Daniel Elliott.	Aug. 3, 1817	April 24, 1854	April 28, 1854	.....	Acting Governor.
Mr. Charles Edward Trevelyan, K.C.B.	April 28, 1854	April 28, 1854	March 28, 1859	March 31, 1859	
Mr. William Ambrose Morehead.	March 28, 1859	March 28, 1859	June 8, 1860	June 24, 1860	
Mr. Henry George Ward, G.C.M.G.	Oct. 16, 1826	June 8, 1860	July 5, 1860	.....	Acting Governor, first time.
Mr. William Ambrose Morehead.	July 5, 1860	July 5, 1860	.....	.....	Died at Madras on the 2nd August 1860.
Mr. William Thomas Denton, K.C.B.	Oct. 16, 1826	Aug. 4, 1860	Feb. 18, 1861	.....	Acting Governor, second time.
	Feb. 18, 1861	Feb. 18, 1861	March 27, 1866	March 28, 1866	Acted as Viceroy and Governor-General of India from 2nd December 1863 to 12th January 1864.
Mr. Edward Maltby.	Sept. 9, 1829	Nov. 26, 1863	Jan. 18, 1864	.....	Acting Governor.
Lord Napier of Merchiston, K.T.	March 27, 1866	March 27, 1866	Feb. 19, 1872	.....	Embarked for Calcutta on the 19th February for the purpose of assuming temporarily the office of Viceroy and Governor-General of India on Earl of Mayo's death.
Mr. Alexander John Arbuthnot, C.S.I.	Sept. 21, 1842	Feb. 19, 1872	May 15, 1872	.....	Acting Governor.
and Robert.	May 15, 1872	May 15, 1872	.....	.....	
Mr. William Rose Robinson, C.S.I.	Sept. 21, 1842	April 29, 1875	Nov. 23, 1875	.....	Died at Madras on the 27th April 1875.
the Duke of Buckingham and Chandos.	Nov. 23, 1875	Nov. 23, 1875	.....	.....	Acting Governor.

Communicated by the Compiler, a Member of the Madras Civil Service.

VI.

THE ULTIMATE SOURCE OF COMMON SALT.

WHEN we see the surface of the earth to a great extent bathed in a solution of common salt, and read of salt regions and mines of rock salt as existing in every quarter of the globe; when we consider, moreover, the vast importance of this salt in the economy of the life of our planet, whether animal or plant life, we are naturally led to speculate as to the source whence all this salt was originally derived, and the methods, hardly less than providential, which have been employed in its distribution. To this inquiry we must bring some little knowledge of chemistry, geology, and practical salt manufacture. The latter especially is of great use in explaining appearances which would otherwise prove deceptive or obscure. Common salt, it is perhaps needless to say, is chloride of sodium, composed of the two elements chlorine and sodium, and termed in chemical nomenclature sodic chloride. Let us first see what are the salt sources now existing. If we examine the crust of the earth analytically, we find it composed of a number of non-metallic and metallic elements, as oxygen, silicon, aluminium, calcium, magnesium, potassium, sodium, iron, carbon, sulphur, hydrogen, chlorine, &c., &c., frequently repeated in different combinations, but occurring in the order of frequency enumerated above. It will be noticed that chlorine is comparatively scarce, at the bottom of the list given, which contains the principal earth-forming elements; and although sodium is plentiful enough, it may as well be said, at once, that the only source of sodic chloride, or common salt, to be found at

present in the earth, is rock salt itself. Sodid chloride does not enter appreciably into the composition of the solid crust of the earth at all, except where it is found as a separate and distinct formation, known as rock salt.

If, in the earliest ages of our planet, before its substance had been differentiated into dry land and water, sodid chloride was diffused through its mass, we should expect that in the gradual denudation of the earth's surface, which followed in later ages, the sodid chloride and more soluble salts would be dissolved and retained in solution, whilst the less soluble matters would be deposited. This is almost exactly what we find to be the case. The sea is a great reservoir of sodid chloride and all the salts more soluble than it; and the land is composed of rocks for the most part sedimentary and little soluble, whilst there is no salt worth considering in it, except rock salt, which is a distinct and peculiar formation.

The most important question we have consequently to consider at the outset, is, the source of rock salt. Has it been deposited from the sea, or has it been ejected from the molten bowels of the earth, or can it have come into existence in any other way? These are problems upon which philosophers are not yet agreed. Their solution will depend a good deal upon the information obtainable from an examination of the age, extent, formation, and origin of rock salt, which will now be considered.

Geologists are wont to consider the strata which form the earth's crust, as the tablets of time, written at successive epochs, on different materials, and stamped with different characters, the characters that happened to exist at the period that the tablets were formed. If we unfold the strata and examine the tablets, we find that they are superimposed, one on top of the other, not very regularly now, since earthquakes have upheaved them and denudation has blotted them out in parts, but sufficiently so to render it a moral certainty that they had been

formed, one after the other, at long intervals, the lowest first, the highest last, and the others at intervening periods of time, according to their position. If we examine the characters stamped upon them, the certainty of their having been formed at successive epochs, becomes absolute, for we find the lowest stamped with the fossil remains of the beginnings of life, and those only, the others with higher and yet higher organisms added as we ascend, until we reach the highest or most recent, in which, and in which only, together with many of the preceding, the remains of man are found. Geologists assign a date to the earliest of these records that takes us back in imagination many hundred thousand years, and students of geology, as a rule, willingly admit the accuracy of the assumption; in fact, the more willingly, the more they know about it. Here let me interpolate, for the benefit of those who dislike on religious grounds such wholesale inroads on time, that Hugh Miller has forged from the consideration of these facts, one of the most powerful arguments in favor of the truth of the Mosaic record—see his “Testimony of the Rocks.”

These geological tablets are composed of various materials, from the flags and slates of Silurian times, to the sand and mud of yesterday's inundation. Many of these materials are repeated over and over again, showing that the same natural forces have been at work with the same substances throughout the whole record. Rock salt is one of the rocks most often repeated. It can hardly be considered a tablet itself, but it is interleaved in the record, and its position in point of time is clearly discernible. The Wieliczka mine of rock salt in Poland, the largest known, is, as far as one can judge—for its limits have not been reached yet—included in Tertiary rocks, and therefore of comparatively recent origin. Proceeding downwards in the earth's crust, or further back in point of time, we come to the Trans-Indus or Kohat salt formation, which is the oldest rock in the district,

and is considered by the Geological Survey to belong to the Eocene period. The salt rocks of the Pyrenees are also Eocene. In the Austrian Alps the salt is in the older Oolitic record. In Switzerland it is older again in the Lias. In Württemberg it is in the Muschelkalk. In England the salt mines are in the New Red Sandstone, but many salt springs issue from the Carboniferous rocks, which are older still. In China, Burmah, and at Bakur on the Caspian, salt springs are associated with springs of mineral oil and naphtha, supposed to originate also in the Coal measures. The salt rocks of the Alleghany Mountains, Washington Co., Virginia, U.S., are Silurian. A salt spring at Keswick rises from the lowest division of the salt rocks of Cumberland, in the Lower Silurian. And the Cis-Indus, or Indian salt range proper, to which the Mayo mines belong, is the oldest of all, the oldest mine discovered in the world, being covered over by Silurian strata. It would be, in the present state of our knowledge, useless to speculate as to the age of the Mayo salt mines. Many thousands of years separate our time from that of the formation of the Wieliczka salt mine, the most recent of the series enumerated. Intervals of thousands of years separate the members of the series, one from another, and the Mayo salt mine must be hundreds of thousands of years old. It is at the very furthest extremity of the geological record, and its formation may be said to be coincident with the beginnings of life on our planet. So much for the age of rock salt deposits that are known, and whose ages have been determined. Other undiscovered rock salt formations doubtless exist, whose ages we have no means of ascertaining.

It may be fairly inferred, as a conclusion from the foregoing, that rock salt has been forming, in an intermittent way, throughout all knowledgable time, from the Pre-Silurian period to the Tertiary; but that the Silurian and Carboniferous periods were the most prolific in such deposits. There is no evidence,

that I am aware of, of the formation of rock salt in Post-Tertiary times—a long interval, which includes the Pre-Glacial, and perhaps the Pliocene, the Glacial, Post-Glacial, Pre-Historic, and Historic—the last, or Historic division of which, is known to occupy about 6,000 years.

I purposely exclude from this consideration the salt of the Runn of Kutch, and other similar superficial deposits of clearly marine origin, which do not possess the characters of rock salt.

Let us now see the geographical distribution and extent of rock salt formations. As might be expected, rock salt has very wide geographical limits. It is found in all the older continents of the world, and its discovery in the newer, as Australia and New Zealand, is probably a question of time. It will be sufficient here to mention the principal countries in which it is found. In Europe, it is found in Austria, Poland, Germany, France, Switzerland, Hungary, Spain, England, and Ireland. A vast chain of salt mines extends along each side of the Carpathian mountain range, comprehending the salt mines of Wallachia, Transylvania, Galicia, Upper Hungary, Upper Austria, Styria, Salzburg, and Tyrol. In Asia, it is found in India, Afghanistan, Persia, the Kirghis, and Asiatic steppes of Russia, Burmah, and China. In Africa, it is found in the northern Highlands, in Morocco, Algeria, and also in Madagascar. In North and South America it is found in Washington Co., Nevada, the Andes, the Alleghanies, the Oregon Mountains, Bolivia and Peru, and in an island in the Gulf of Mexico.

As regards its present level in the earth's crust, rock salt is found at the surface, and at various elevations, above and below it. It is also found above and below the level of the sea. The Wieliczka mines are 1,000 feet below the level of the soil, and 400 or more below that of the sea; their lower limits are undiscovered. At Middlesborough-on-Tees, rock

salt was found in a bore hole at a depth of 1,293 feet. At Cordona, in Spain, a mountain of rock salt, the depth of whose base is unknown, rises to upwards of 500 feet. The Trans-Indus salt hills reach an elevation of 200 feet. The great salt lake area of lake Utah, equal to about 2,000 square miles, is situated at an elevation of about 4,000 feet, in the Rocky mountain district. The rock salt at Hallein, near Salzburg, is 3,300 feet above the sea level; and that at Arbonne, in Savoy, is 4,000 feet higher, being perched in the region of perpetual snow at an elevation of 7,200 feet above the sea level.

The physical characteristics of rock salt, and the formation of its beds, will claim our attention before we can satisfactorily attack the problem of its origin; but as these considerations lead up directly to the question of origin, it is as well to open that question here.

A good deal of obscurity shrouds the origin of rock salt deposits, and geologists are not all agreed as to their mode of formation. Dr. Fleming, who surveyed the geology of the Indian salt range in 1848-53, attributed the salt formation to eruptive agencies, as the result of his own observations. Sir R. Murchison says that other distinguished geologists have arrived independently at the same conclusion. Dr. Macculloch remarks of all rock salt formations, "The purity and solidity of the masses of rock salt, their bulk, their insulated and peculiar positions, with many other facts on which I need not now enter, prove that they could not have been derived from the ocean in the manner thus supposed, nor probably in any manner. They are special and original deposits, in whatever way produced." On the other hand the majority, perhaps, of writers upon this subject, look upon rock salt as being a sedimentary rock, of aqueous origin, and formed from the sea. It is nevertheless admitted that the aqueous theory is open to several and serious objections, which require to be

overcome before the theory can be finally established. To explain away these difficulties, and to prove that the sea is the true mother of rock salt, is the task that I have set myself to accomplish in this paper.

I will now notice some of the chief physical characteristics of rock salt. Its chemical composition, it will be hardly necessary to state, is precisely the same as that of ordinary sea salt.

Rock salt is as unlike sea salt, as we know it under the form of "bay" salt, as any two salts having the same composition could well be. Rock salt, in some places, the Trans-Indus range, and Cordona in Spain, for example, forms solid masses swelling out of the earth for hundreds of feet in cliffs and mountains; in others, it sinks deep into the bosom of the ground—a hard rock—which has to be mined with pick and blasting-powder.

It is for the most part translucent, and of a bluish or pinkish color, resembling masses of dimly transparent, flawed glass; yet fine blocks of colorless transparent salt occur in nearly all mines. A rectangular polished block of pure salt, $37\frac{1}{2}$ cubic feet, weighing $2\frac{1}{2}$ tons, was sent from the Mayo mines to the Vienna Exhibition. Newspaper print can be read, through more than six inches of such transparent rock salt. It is as hard or harder than gypsum, and various fancy articles, such as balls, platters, salt-cellars, etc., are turned from it on the lathe. In continental mines it is worked up into statuary having the light effects of alabaster. It forms the pillars, stairs, and horse stalls, used in the rock salt mines.

If we examine closely, however, we find that in all its other properties—chemical, physical, therapeutic, organoleptic, &c.—there is no difference between rock salt and ordinary bay salt. Rock salt, like sea salt, crystallises, in the first, or cubic system, as is demonstrated by its cleavage,

and by isolated crystals found scattered through the mass. Rock salt is stratified. It occurs in beds, varying from a few inches to 1,200 feet, and more, in thickness. In the Mayo salt mine, the whole formation is calculated to be 600 feet thick, composed of strata, each of which is supposed to represent one year's deposit. These strata vary in thickness from 6 inches to 20 feet, and are separated from each other by clay beds, red gypserous, and violet, marls. It is found that the salt is purest, and least stained, in the middle of the seam. *Gypsum beds overlie the salt beds.* In Cheshire, the rock salt is found in horizontal strata, separated by beds of clay and gypsum. Salt crystals are found infiltrated through some of the clay beds. In Würtemberg, the salt is enclosed in seams of shell limestone. At Ischl, in Upper Austria, it occurs in horizontal bands, running through the mountains overlooking the town. These mountains are composed of bands of limestone and rather impure rock salt, separated from each other by colored gypserous marls. The limestone above the salt is scarcely distinguishable in structure or fossils (Oolitic) from that below it.

In general outline, beds of rock salt are seldom of uniform thickness; they are thickest about the centre of the deposit, and thin out towards the circumference, having a lenticular formation. They are often linked together, forming chains, and, when so connected, lie in about the same horizontal plane.

The salts associated with rock salt are precisely those which are formed in association with it in the manufacture of common salt, as gypsum, sodic and magnesian sulphate, potassic and magnesian chloride, &c.

We have now before us, as many of the ascertained properties and relations of rock salt, as will be useful in guiding us to form an opinion of its origin. It will not have escaped notice that most of these mark it as a sedimentary rock of aqueous origin. I will now proceed to

examine, in detail, its claims to be considered as an aqueous rock.

Many salt areas, or salt regions as they are called, are made up of a number of salt deposits, linked together as it were on one horizon. The explanation of this phenomenon is so intimately associated with the theory of the gradual upheaval of areas of dry land from the ocean's bed, that I ^{from} notice both theories together here. One can easily ^{basin} imagine that if large tracts of undulating country, forming natural basins, were submerged in the sea and brought to the surface again, the natural basins would be filled with salt water, which would, on evaporation, yield linked salt deposits of the kind referred to. Now this is almost precisely what is believed to have happened, for it matters little whether the undulating surface was an original sea-bed, or one formed by subsidence. Original sea beds are unknown, at present.

The theory of the gradual interchange of dry land and ocean, which is as well established as any demonstrated geological fact, is associated in many ways with the study of the origin of salt deposits. It is of the greatest importance in explaining the wide geographical distribution of rock salt. It is the key to its position in so many pages of the palæontological record, from the Tertiary to the Silurian era. It furnishes the reason for the otherwise inexplicable position of rock salt deposits at various elevations above, as well as below, the present sea level.

It is believed by geologists, and for ample proof I must refer the reader to works on geology, that slow upheavals and subsidings of land have been going on since the beginning of things, as far as we can trace them; that the dry land has been washed, by gradual denudation, into the sea, and that other dry land has risen from the sea to take its place, that there have been compensatory sinkings as well

as upheavals; and that this interchange of places between the bed of the ocean and the surface of the ground has not taken place once, but often; so that scarce any land exists, except perhaps the tops of high mountains, which has not had its turn, more than once, above and below the water.

If there were such upheavals of large areas from the salt sea, we should find salt deposits upon them. That there were such partial elevations in Pre-Silurian times is evident, *inter alia*, by the rock salt formations of the Indian range. The salt rocks of England go to prove the same thing for the Carboniferous era: those of Switzerland for the Lias; those of the Austrian Alps for the Oolitic; and so of the rest, up to the Tertiary period, in which we find the Wieliczka salt mine. The covering strata lying over these rock salt deposits moreover demonstrate, that the deposits have, after their formation, sunk again into the depths of the sea, and, whilst some have remained there for ages, before coming to the surface, others have oscillated, as it were, above and below sea level. Hence we find layers of rock salt, separated by intervening sedimentary strata, placed over each other in irregular succession, and covered in by other sedimentary rocks. This last fact, however, I will account for presently in another way.

We have other evidence that these elevations of fixed areas were partial, that they took place in each succeeding epoch, and that they were widely distributed over the face of the globe. Rock salt formations confirm this evidence in a conclusive manner, and they further tell us what areas were elevated, and at what periods.

It will be seen, therefore, that the assumption of the marine origin of rock salt is closely linked with that of the movement of the earth's crust, which ranks as a well ascertained fact. This alone creates a strong bias in favor of the marine theory of its origin.

But there is also much internal evidence in rock salt formations that they were formed from the sea by deposition. Rock salt deposits are described as lenticular, that is to say, the *greatest depth* of the salt is found *in the centre*, and as the edge is approached the deposit thins out and diminishes. The same description applies to most natural basins, whether lakes or seas. If rock salt were of aqueous origin and formed from marine basins, the deposit would have the shape of the basin, below, whilst plain above; it would form a plano-convex lens, thick in the centre, and thinning out to the circumference; convex below, and plane at the surface, such in fact as we find it. Here is another strong presumption in favor of its marine origin.

But rock salt is also a stratified rock. When undisturbed, it is found in horizontal beds, and these beds are often interleaved and separated by others of clearly aqueous origin, as gypsum beds, sandstone, limestone, marl, &c. Stratification is admitted to be one of the most distinctive marks of the aqueous origin of a rock formation, and this stratification, in alternate layers with sedimentary rocks, is almost conclusive proof that rock salt itself is sedimentary.

Although rock salt deposits are by no means fossiliferous, still bivalve and other marine shells, casts of fish, &c., are not wanting in most deposits to testify to their marine origin. In the *Cis-Indus* salt range, the oldest known, shells of one genus of mollusca have been found. A block of rock salt from the Wieliczka mine—the youngest mine of rock salt and about the finest in the world—on being examined by Professor Philippi, was found to contain 5 zoophytes, 1 echinus, 1 serpula, 7 conchifers, 8 univalves, 3 crustaceans, and a cirrhitium identical with one now living in the Mediterranean. Such instances might be multiplied.

Again, certain other salts of peculiar significance, as calcic sulphate, are almost invariably found associated with common

salt in rock salt deposits. At Stassfurth, in Prussia, magnesian sulphate is found; and lately, a large deposit of sodic sulphate was discovered. At Vilia Rubia, in Spain, glauberite, a compound of the anhydrous sulphates of lime and soda, occurs in the salt. In the Mayo mines, magnesian sulphate and chloride are found in combination with other marine salts. One or more of these salts have been found in connection with all salt mines, which have been thoroughly explored. Now, these are, as before stated, precisely the salts which are formed naturally, wherever sea-water is evaporated to dryness. They do not all form at the same time, or temperature. Magnesian sulphate for example, in sea brine, changes, at the freezing point, into sodic sulphate. Magnesian chloride is so very deliquescent that it rarely can be obtained by solar evaporation. We could not therefore expect to find them all present in a single salt mine; even if there were not excellent reasons connected with their solubility, for expecting the contrary. It is enough, therefore, that we do find them all represented in different rock salt formations.

As illustrating in a practical way the relation of modern sea salt formation to ancient salt deposits, it may be interesting to mention that a few years ago, a French company, which had a very large business in the manufacture of sodic sulphate, by the winter evaporation of sea brine, was obliged to stop work, owing to the discovery of a large deposit of sodic sulphate in the Stassfurth rock salt mine.

But the most emphatic instance of the association of sea salts with rock salt is to be found in the presence of gypsum. Gypsum, or calcic sulphate, is a very insoluble salt, and therefore one of the earliest deposited in the evaporation of sea brine. It deposits from sea water when the latter is evaporated to about one half of its bulk, almost irrespective of temperature. As, owing to its insolubility, it is rarely taken

up again, we would expect to find it with rock salt, if the latter were of marine origin. As it happens, we do find it. Gypsum is always present with rock salt. They go together so much as a matter of course, that even the unobservant Afghans have taken notice of the circumstance, and have christened gypsum, "the brother of rock salt." This relation of gypsum to rock salt will have to be gone into, more particularly, when reviewing the objections to the theory of the aqueous origin of rock salt.

Rock salt and the gypsum associated with it are often stained, by colored clays, a variety of hues, of which, however, pink or some shade of red, is the most common. Common salt, manufactured from the sea, with indifferent care as to cleanliness, is much stained in the same colors. It is remarkable, too, that a pink scum forms on the surface of the salt water at many salt manufactories, staining the salt a pink color; so that the produce of some salt works may be known by this tinge, even as the produce of some salt mines is known by its red shade. It would be useless here to enter into a discussion as to the nature of this coloring matter; it is either organic, or an oxide of iron. It may be one or the other, according to circumstances.

We now come to the crystalline structure of rock salt, and here we touch the edge of the difficulty regarding the aqueous theory of its formation. It is objected to this theory that the homogeneous, transparent, crystal, structure of the rock is unlike any product of the evaporation of salt water as we know it. Such indeed is the case, but we have no large inland salt sea, evaporating, to compare with at the present time, except the Dead Sea, in which the process is not sufficiently advanced for our purpose. There are, however, some inland salt lakes from which we may take a lesson with advantage. Lake Oroomiah, in Persia, and the Elton Lake, in the lowest part of the great Aralo-Caspian plain,

offer examples of the formation of rock salt by deposition in the beds of inland lakes which are gradually evaporating and filling up. Lake Kosiak, situated on the right bank of the Irtysh in Asiatic Russia, is a similar example. Some of the zoutpans, in South Africa, are likewise solidifying. But the best illustration is found in Lake Inder, which lies in the valley of the Ural River. The bottom of this lake is an immense solid mass of salt, covered with a shallow sheet of brine. At the end of summer, the lake entirely dries up, and forms one solid block of salt. These lakes teach us that large masses of solid salt may be formed in comparatively small areas, by evaporation, under certain climatic conditions, even at the present day.

Let us consider the conditions which prevailed when the old rock salt was formed, as far as they affect crystalline structure. Some deposits, it will be remembered, are 1,200 in thickness. Considering that it takes about 6 cubic feet of saturated brine to produce one cubic foot of salt, and that when salt deposits, the brine has a specific gravity of 1,208, and lies in the deepest hollow of its basin, we can imagine what an enormous depth of dense brine must have presided over such salt formations. The salt must have been formed at profound, motionless depths, in which the stillness was only broken by the growth of crystal structure. It must have been formed under gigantic pressure, from such depth and density of brine. We have no parallel to these conditions of crystal growth, at the present day; we can only imagine, *a priori*, that the resulting crystal must be very perfect, resembling a mass of glass.

But the effect of crystalline contraction, the effect of lapse of time, and the effect of superincumbent pressure have also to be considered. The force of crystal growth is a very powerful one. Where, as in the growth of ice, it takes the form of expansion, it bursts iron pipes with ease. In salt

masses its tendency is to contraction, to perfection of crystalline structure; given a sufficient lapse of time, and suitable conditions, and it will effect its purpose. What period of time has this force had at its disposal in the most recent of our mines of rock salt? As before stated, many thousands, nay, many tens of thousands of years. During all this time, moreover, what pressure has been at work on the salt mass crushing it down, with the irresistible force of the most powerful hydraulic ram, into a solid homogeneous mass! The pressure, like the time, is beyond our computation; we can only measure it by its effects. We see the rock salt sometimes interleaved with sedimentary masses, which have been crushed into compact rocks. We find it covered over with hard coal, which we know to have been, once, a loose vegetable deposit. We find a variety of other rocks, overlying the salt, bearing the same testimony with more or less force; and in some cases, as in the Austrian Alps, we find the salt buried, at the present time, under masses of rock, whose weight and pressure we can calculate. What wonder, therefore, that rock salt is a crystalline mass, and not as the salt deposits recently formed in our shallow bays. If the case were otherwise, there would be good ground for rejecting the marine hypothesis. Let it be remembered that the protozoa, whose fossil remains make up the chalk cliffs of England, were swarming in life, in our northern seas, long after the deposition of all but the most recent beds of rock salt.

Another peculiarity of rock salt, which is held by some to tell against the marine view of its origin, is the rare presence of fossil shells and fishes, &c., in its formations. It is argued that if this salt was deposited by the evaporation of an inland sea, we should find abundant organic remains in it, as we know that salt acts antiseptically, that is, it preserves organic remains. This comparative absence of fossils can, however, be explained on natural grounds. Life ceases to be

supportable in brine of a certain density. In the Madras salt works, it is found that the mollusca, crustacea, fishes, &c., which find their way into the salt beds, whether voluntarily, or through the agency of the lift pumps, begin to work their way out expeditiously, by all possible channels, as soon as the brine reaches a density of 5, or 6°, Beaumé; and that at 7, or 8°, Beaumé, those left behind, sicken and die, so that at 9° Beaumé, not a living animal is left in the brine. At 7° Beaumé, the sea water has been reduced, by evaporation, to about one-half its original bulk, gypsum is depositing and continues to deposit for some considerable time, until the brine is reduced to one-quarter of its original bulk; but common salt has not formed, nor does it form until long after, until but one-tenth of the original brine remains. So that, if we imagine that all possible means of escape were cut off from the inhabitants of our evaporating sea, and all had perished, we should find their remains buried in the soft mud under the gypsum, which would subsequently cover them over with a thick deposit. But, there is reason to suppose that the gradual elevation of salt areas was a protracted work of time, in which opportunities were afforded for the living contents of the rising estuary, or sea, to join the main ocean, before evaporation had made the brine uninhabitable. We can easily conceive, how, at the first warning of increase of density, every living creature would make for the connecting straits and shallows, and dart into the great ocean; and how finally, some molluscs and crustaceans, overtaken in their slow flight, would fall, die, and be buried, at the extremity, or confines, of the shrinking sea, far away from its central salt deposit. In point of fact, almost all salt deposits do contain the fossil remains of a few specimens of the marine fauna which existed at the date of their formation, and not seldom in the rock salt itself; from which it may be argued, with a considerable approach to certainty,

that these marine specimens lived and died in the neighbourhood, and were washed into the deep salt area, from the surrounding gypsum, after salt formation had commenced.

The most serious objection to which the aqueous hypothesis is open is founded upon the abnormal position of the gypsum which overlies the rock salt, at some places, instead of being beneath it, as it should be theoretically, since it is much the less soluble salt and the first to deposit, and since it does practically lie under the salt, at all modern salt deposits which have been observed, in rectangular artificial basins. This is unquestionably a surprising difficulty. It is not, however, an insuperable one. There are various ways of accounting for the anomalous position of the gypsum, and some of these ways have much force of reason and truth about them. Some argue that the gypsum was originally deposited beneath the salt, but that it was subsequently removed by subterranean denudation, by hot springs or currents, forcing their way up from lower levels. Others think that upheavals and overthrows caused by the secular cooling of the earth crust, or by volcanic action, of which we have much evidence in the condition of the salt and other rocks, may have led to a reversal of the original order of the deposit. It may be said, too, that we can hardly deduce from theoretical and observed conditions, at the present day, the sequence of events which took place remote ages ago, when some of the conditions of soil and brine were certainly different from what they are now.

I am of opinion that the explanation is, after all, not very far to seek. There is no difficulty, whatever, in accounting for the presence of gypsum, on top of the salt deposit, or in strata running through it. The problem lies in the absence of gypsum beneath the salt. Now, as to this, gypsum is found at the bottom of the salt deposit at many places which have been worked out, or have been exposed in section. It is so found at Ischgl in Upper Austria, at Wimpfen, in Würtem-

berg, and at other places. And it may be said, too, of the great majority of rock salt formations, that the true bottom has never been explored. In many cases the bottom of the rock salt has not been reached; in many others, as in Cheshire, where rock salt strata alternate with strata of marl, the exploration is given up as soon as inferior salt is tapped in deep workings, or, as soon as marl is found underlying it at unprofitable depths. The lowest stratum of rock salt overlying the gypsum is generally so inferior, and mixed up with gypserous marls and shell limestone, as at Wimpfen, that where these things are done for profit, exploration is at once abandoned. It is most probable that gypsum does underlie the salt oftener than is suspected, but as will be shown in the next para. it is not essential to the aqueous theory that it should be so.

The way in which gypsum comes to overlie the salt deposit is this. Gypsum attains its maximum of solubility when the density of the sea brine equals 4° Beaumé, or specific gravity 1,033. If the volume of ordinary sea water be taken as 1,000, its volume, after it has been evaporated to the density specified, will be about 850. If there be sufficient gypsum to form a saturated solution, any further diminution in volume, accompanied as it must be by increase of density, tells on the contained gypsum, a portion of which becomes insoluble and separates. This deposition of gypsum from sea brine continues from volume 850 until the volume of the sea water is reduced to 100, or to one-tenth of its original bulk, at which point hardly a trace of gypsum remains. At this point the deposition of common salt begins. We have now to consider the shape of the sea basin in which the deposit is taking place. Without going into mathematical figures, it is sufficient to observe that it has a slope from the circumference to the centre, and that as the volume of the sea diminishes from 1,000 to 100, its waters naturally gravitate towards the centre or deepest part into

which they finally subside. It is precisely whilst this shrinking is going on from 850 to 100 volumes that gypsum ~~is~~ being deposited, so that when the brine reaches the centre ~~and~~ begins to deposit salt, very little, or perhaps no gypsum may be left in it. It all depends on the configuration of the sea bottom. In all ordinarily shaped sea basins, therefore, having shelving shores sloping to a central abyss, we will have a large deposit of gypsum laid bare by the receding brine, and in many cases the whole of the gypsum will be thus left behind away from the salt.

What follows is this. Common salt is deposited in a large circle in the centre or deepest part of the sea bottom. This may go on uninterruptedly until all the salt has been parted with, in which case, we would have a large central salt deposit, surrounded by a much larger circle of gypsum, deposited on a slope, at a higher level. It only needs the intervention of rain and flood to complete the picture; the gypsum is washed over the central salt deposit and settles upon it, covering it over with a thick impermeable stratum, which protects it from further injury and seals it up for future use. But more likely, storms will overtake the process, more than once, before its completion, and floods of gypsum and mud, with mollusc shells perhaps, will contaminate the brine, and settle down upon the salt, which, in its turn, will form again upon the gypserous bottom; and so alternate layers of rock salt and gypsum, or gypserous marls with shell limestone, &c., will come to be formed, precisely as we find them.

After an uncertain lapse of time, this salt basin would be completely filled up, by the gradual deposition of sedimentary matters carried in by streams, or by the dust of aerial currents. Once filled up, our rock salt basin loses its power of drawing solid materials to itself; it forms a part of the great highway to the sea, and comes under the influence of

denudation. If there have been hills upon its boundary, those will send down streams upon it. If there are no hills, it will be in the track of some distant watershed sending its winding river to the sea; or perhaps, it will be the scene of volcanic action; or of secular cooling and contraction, with upheaving of the earth crust in irregular mountain thrusts. The contorted strata of many of the rock salt deposits tell of the pressure and crushing to which the salt has been subjected by these very movements. Indeed, the present stratigraphical condition of many salt deposits, and the myriad cracks and flaws in the salt crystal can hardly be attributed to any other cause. In whatever way produced, streams will cross the site of the salt formation, and the work of denudation will be in time accomplished. Streams will grow into rivers, which will cleave across the ancient sea basin, cutting it down from its topmost stratum to the base of the rock salt deposit, or lower still; and as the work progresses, hills and cliffs of rock salt, with their gypsum and other coverings, will grow up on either hand, as at the Trans-Indus salt range, and at Cardona in Spain. Or it may happen that the site is not the scene of powerful denudation, and that the rock salt will be buried out of sight, and out of knowledge, for an indefinite time. Or that the movement of elevation continues until the rock salt lies secure at such altitudes as at Hallein, or Arbonne, where it is actually found. Or that movements of depression carry the region once again to the bottom of the ocean, where the rock salt, secure beneath the gypsum, receives an enormous addition to its other coverings. All these are not only possibilities, they are certainties, and have happened. Geology will bear me out in this. It would pass the limits of this paper to enter further into detail.

I have now disposed of the chief objections to the marine view of the origin of rock salt. There remain some minor objections of comparatively little account. Superior salt is

ometimes found crystallised in lenticular, or ring-shaped masses, in the midst of inferior salt; this is not a usual sedimentary arrangement; it is a difficulty. But, when we consider that we have to deal with crystalline masses of unexampled extent, and with crystalline forces which are imperfectly understood, this crystal, within a crystal, has nothing startling about it. It exemplifies, in crystal masses, a form of natural selection which we see illustrated by concretionary nodules, elsewhere, and by the lenticular gypsum crystals which are found in salt marshes.

Again, veins of rock salt, at various angles, are found running through the stone, or indurated clay beds, associated with rock salt in some mines. At Cheshire, for instance, such veins occur in the flag beneath the salt. From the nature of these stones, it is not difficult to suppose that they may have been traversed by cracks and fissures, into which brine would percolate, and crystallise. The salt is crystallised, and not fused in the veins, as it would be, if of igneous origin; and very perfect cubic crystals are often found in such situations.

These difficulties, which are of little account in themselves and easily explained away, lead up to the igneous theory of the origin of rock salt. The presence of sodic chloride in hot springs is taken as evidence in the same direction; as is also the presence of common salt in the eruptive matter of Mount Vesuvius. All we know about hot springs, is, that the water comes from a distant and perhaps warm region, though it may receive its warmth in transit, and that the water takes up in solution more or less of the soluble salts it comes in contact with. Rock salt deposits are abundant enough in most parts of the world to account for the presence of salt in such springs. Hot springs are very common in the salt regions of China and Burmah. Perhaps the association of coal and mineral oil, with salt, may

account for the heat, as well as for the saline phenomena of such springs. As to Vesuvius, the salt formed in its eruptions is associated in such proportions with the minerals which invariably accompany rock salt formations, that geologists have little doubt that the volcano is situated over an ancient salt bed. As a rule, with the exception of Vesuvius, and Heckla in Iceland, whose craters are incrustated with salt, sodic chloride is not a volcanic product; and Heckla, like Vesuvius, it should be noticed, is situated near the sea, and submarine volcanic action takes place at times off the coast. Primary and eruptive rocks contain but little trace of sodic chloride. It never forms dykes, and there is no stratigraphical or other evidence of its igneous origin.

In fact, it may be said, that the igneous theory takes its origin, not in any positive evidence of igneous action in rock salt, but in the evidence afforded by the position of gypsum, and other facts, apparently excluding the aqueous theory. Hence the consequent necessity for starting some other theory to explain the presence of rock salt. It is true that semi-anhydrite, a sulphate of lime crystallising with 6.21 parts per cent. of water, which forms only under pressure and at high temperatures, is sometimes found in the Indian salt ranges. But this need only confirm the evidence, which is otherwise strong enough, that many rock salt formations have been subjected to volcanic action. There are fatal objections to the igneous theory which practically put it out of consideration. The association of rock salt with naphtha and petroleum is justly held to exclude igneous action, since these would otherwise have been burnt off and volatilised. The unburnt organic remains, the unburnt coal, and the presence of unburnt gypsum in all salt formations are convincing proofs that these formations had not a birth and baptism of fire. In conclusion, it may be affirmed that the weight of evidence is entirely with those who believe that rock

salt is of aqueous origin, and that it is a marine deposit. The appearances which seem to bar this theory are easily explained away, whilst those which establish it are so numerous and so cogent that the theory passes as a reasonable belief worthy of acceptance.

We have now to consider the effect of this conclusion upon the composition and qualities of the ancient or palæothalassic sea. We have extracted, in theory, from this sea, an enormous body of common salt. Let us endeavour to estimate the amount. There are not sufficient data available to form an accurate estimate even as to the quantity of rock salt at present *known* to exist, but some idea may be formed on the subject, by a passing glance at some of its principal formations. The most extensive mines in the world are those found on the continent of Europe, extending for 500 miles along the Carpathian mountains, stretching out laterally for 100 miles and having a thickness in some places of 1,200 feet. In neighbouring Galicia the Wieliczka salt mine is the largest known. It has been worked for the last 629 years. Some of its galleries stretch for 40 miles and yet the resources of the mine have scarcely been touched—so great are its conjectured dimensions. The area occupied by the Trans-Indus or Afghan salt region is about 1,000 square miles, and it is estimated that about one-fifth of the entire area is taken up by salt, which frequently occurs in marked exposures. In one place, for a stretch of four miles, the rock salt forms bold cliffs, rising to 200 feet, on either side of the banks of a stream. The bottom of this salt deposit is unknown. Mr. Wynne of the Geological Survey estimates its thickness, in parts, at 1,200 feet. The same authority estimates the Cis-Indus, or Indian, salt range, as extending 134 miles in length by about 5 miles in breadth, comprising an area of about 670 square miles. The salt zones in this region have a thickness

ranging from 100 to 275 feet. In England a large bed of rock salt lies beneath the valley of Cheshire, from Malpas to Congleton. There are about 25 pits now open in this region, of which seven are at Marston, and six at Winsford. About 40 old workings are closed. The Northwich mine has been at work for 210 years. The two beds of rock salt in the Marston mine are, each, about 90 feet in thickness. The annual output of rock salt and salt made from rock salt brine, in England alone, is estimated at about two million tons at the present time. This is but a rough sketch of the mass of rock salt in three or four of our best known salt regions; taken in connection with the geographical distribution of rock salt, it enables us to form some idea of the enormous masses of rock salt which exist scattered over the globe, known, and unknown.

It would not be rash to estimate the known salt deposits at one-half of the existing whole, since much more than half the globe is covered with water and out of ken, and the mineral resources of the habitable portion are as yet imperfectly explored. This salt, if the views herein expressed regarding its formation be correct, was separated from the sea by evaporation. In this process, oceans of salt water have been evaporated, and oceans of aqueous vapour have been carried back, in clouds, from the rock salt formations to the sea. We have no reason to suppose that the sea is either greater, or less, in volume, now, than it was in the Pre-Silurian period. On the contrary, geologists conclude that it remains the same. Hence we have herein, if the aqueous theory be correct, excellent reasons for supposing that the primeval sea was much more saline than our own. Dr. Warth has calculated the cubical salt contents of the Mayo mines at 10 cubic miles. From the very early period at which the Mayo mines were formed, down to the Tertiary, we have the geological record as a witness, that

an uninterrupted series of movements of the earth's crust has resulted in the almost continuous extraction of salt from the sea, by the cubic mile, and the restoration of fresh water, in the proportion of 60 cubic miles of water to one of salt. It follows that down to the Tertiary period the sea has been diminishing in density. We may even make a rough calculation of its loss. The careful researches of M. Krummel show that the volume of the entire sea is 3,138,000 cubic miles. Judging by its chemical composition, at a moderate estimate, it would contain at the present time over 50,000 cubic miles of salt. Say that the Mayo mine represents only the one-hundredth part of the existing salt deposit. This is putting the salt deposits at the very *largest*, for the Mayo mines, from comparisons I have made, would seem to be equal to much more than one-hundredth part of all known, and unknown, salt formations. Thus we get 1,000 cubic miles as the outside measure of all existing rock salt formation. From this it would appear that the sea has, after all, only lost about 2 per cent. of the salt it originally held.

The same reasoning applies to the movements of gypsum. We may be sure that it was extracted from the sea in a like ratio, and that the total loss, up to date, is 2 per cent. of the amount once held in solution.

Now, this loss of 2 per cent. of the salt once held in the sea (of 1,000 parts in 50,000) is almost inappreciable. The English Channel, according to Schweitzer, contains over 2·70 parts per cent. of salt. If all the salt in all the rock salt formations was restored again to the sea, the channel water would contain less than 2·76 per cent. of salt, that is, its increase of salinity would be represented by less than ·06 per cent. No one would be the wiser for it, not even the fishes.

But there is reason to suppose, that, for some thousands of years past—since the Tertiary period—rock salt has ceased to form, and a recuperative process, as regards the salinity of

the sea, has been taking place instead. Rains and rivers have been washing the hills and valleys of the earth of their soluble salts, and large quantities of sodic chloride have been carried back to the ocean. It has been calculated that the River Mahanady, which discharges into the Bay of Bengal, near Cuttack, carries into it in solution, daily, about 3,000 tons of sodic chloride. Much of this salt is, doubtless, restored to the sea from the Silurian or Cis-Indus salt deposit, the very oldest known. This process has been going on for some thousands of years, so that the sea is probably now stronger in salts than it was in the Tertiary period, but the difference would be in any case trifling. The effect of salt manufacture over the world may be neglected, since bay salt obviously soon comes to form a surface deposit, which regains the sea within a few years.

From all this, it is evident that the palæothalassic sea was hardly different, in specific gravity, or salinity, from that which now exists, and that therefore the same species of plants and animals could flourish in it. This conclusion agrees with that arrived at by palæontologists working on a different line. They found the marine fossil fauna and flora of the very earliest times so little different from the primitive types now existing, that they conjectured them to have lived under marine conditions similar to those now obtaining. With regard to the salt restoration process, it may be interesting to note that a cubic mile of rock salt weighs 6,111,298,900 tons, taking the weight of a cubic foot at 93 lbs. Ten large rivers, such as the Mahanady, carrying off 3,000 tons a day, would require over six thousand years to dispose of one cubic mile, so that there is no immediate prospect of a rock salt famine. Mr. Warth's mine alone would keep us in rock salt for 60,000 years.

We have now traced the salt back into the palæothalassic sea. Let us go back one step further and try to obtain a

glimpse, even though an imperfect one, at its previous condition. It is considered certain, by astronomers and geologists, that, in the earliest Azoic period of creation, the temperature of the earth was so high that it formed a molten mass, and all volatile bodies, or those capable of being converted into vapor at high temperatures, surrounded the globe as an atmosphere; that the ocean literally boiled, and hot steam mixed with the other atmospheric vapors. We may imagine sodic chloride to have existed in the gaseous state at this period. There can be little doubt about the sodium element having so existed, since by the aid of the spectroscope we see it in the atmosphere of the sun and those stars, as Aldabaran and Betelgeux, which have been carefully examined. There is some doubt about chlorine, since it hardly exists, as such, at higher temperatures than 800° C. The recent experiments of Victor and Carl Meyer, of Zurich, show that it diminishes in density up to 1,200° C., at which point it is about 1.62, and increases in volume one-half, becoming alotropic. Be that as it may, however, with the gradual fall of temperature, sodic chloride would form, and deposit upon the surface of the land and water: and as the cooling process continued, the aqueous vapor would condense and fall upon the earth in the shape of rain, which would dissolve and wash out all the salt into the sea. In the end the sea would gradually lick up and appropriate, by constant interchange of elements, rising clouds and falling rain, all the soluble salts on the face of the earth, except those protected by insoluble coverings. And so the sea would become the great reservoir of soluble salts that we find it, as stated in the beginning of this paper.

Before leaving this part of the subject let me draw attention to the remarkable provision of nature which places gypsum, one of the least soluble of rocks, uniformly as a covering over sodic chloride, one of the most soluble, as, to

this, in all probability, we owe the preservation of the vast stores of rock salt which now exist. If the presence of salt everywhere is considered an evidence of design in the creation of the world, how much more so is this arrangement, which so effectually preserves it through untold ages of cosmic change.

In considering the source and origin of common salt I have purposely overlooked one natural feature, possibly concerned, even at the present time, in its formation, namely, chemical agency. I have indicated that originally all the salt which now exists was formed by the chemical combination of sodium and chlorine, previously existing in a state of vapour, and have inferred from recent experiments with chlorine, that this combination could not have taken place until the temperature, and pressure, had fallen to a certain point. But I have not reproduced chemical action in later times inasmuch as the question under discussion referred to the origin of rock salt, as a geological formation, in which it is evident chemical action could not have been directly concerned. Nevertheless, lest it should be objected to this paper that one existing source of salt formation has been entirely overlooked, I will here glance at the natural chemical formation of common salt, merely premising that it is a local and comparatively insignificant process.

Common salt occurs here and there, at rare intervals, on the earth's surface, as an efflorescence; or, in brine exuding from the base of mountain formations, in no way related to rock salt; in situations, in fact, in which no common salt was to be expected on any theory previously referred to in this paper. Such deposits are said to exist largely in Chili, and their formation has been studied by M. Pissis, who has drawn up a report on the subject for the Chilean Government. At the base of the Shevaroy Hills, in the centre of the South Indian peninsula, a salt spring or salt lick, used

by cattle, exists, whose presence can only be accounted for by chemical action. The whole district is a mass of hornblende, quartz and felspar, shot with trap. Mr. Bruce Foote, of the Geological Survey of India, accounts for this salt by chemical action. I am not sure that the Chilean salt is not after all marine, but I will give here the substance of M. Pissis' report on the subject. He states that the salt is associated with large quantities of potassic nitrate, which is not found in marine formations, and there is an entire absence of stratified rocks, which are found associated with ordinary rock salt. The salt deposits are on the surface of the hill plateau (the Cordillera of Maricunga) at various elevations up to 13,200 feet, but not in the valley beneath. Marine shells are quite absent from this deposit. He argues that the salt must have some independent local origin. Besides sodic chloride and potassic nitrate, calcic sulphate and sodic sulphate are, however, largely present.

For the manufacture of the above salts in nature's laboratory, sodium and calcium-nitrate, chlorhydric and sulphuric acids, are required. The surrounding rocks are felspathic and the soil is a felspathic detritus. The felspaths are composed of albite, labrodite, and oligoklase. Labrodite contains a large quantity of lime; albite from 8 to 10 per cent of soda; oligoklase contains both potash and soda—here are the bases. The same rocks furnish some of the required acids. They contain pyrites, which may yield sulphuric acid on oxidation, and trachytes, which furnish chlorine and chlorides. The atmosphere yields nitric acid. The experiments of Chlões prove that nitric acid is formed by the action of alkaline carbonates in the presence of oxidizable matter. Now, M. Pissis believes that all the decompositions and recompositions required, resulting in the ultimate formation of the salts actually found, are constantly going on, and are sufficient to account for the existing salt and other deposits.

The deposits referred to are found as follows: on the surface, sand, clay, porphyritic and quartzite stones; next, a firmer layer of conglomerated gypsum and salt; next, sulphites mixed with potassic nitrate, sodic chloride, sodic iodide, potassic sulphate and sodic sulphate; lower still, pure sodic chloride and clay, resting on porphyry and granite. Whatever the mode of origin of these salts, it is at least curious that they should be, with the exception of potassic nitrate, a salt easily formed in nature just such as characterise marine deposits. I am willing to attribute the Shevaroy salt lick to chemical action, seeing that it appears to be a very limited source of salt; but in the presence of large deposits of gypsum, common and other marine salts, apparently in a stratified condition, I would prefer to suspend judgment. The question is unsettled and requires an attitude of reserve.

JAS. J. L. RATTON.

NOTE.

It is important that I should explain fully the data from which I have calculated the amount of salt in the ocean.

First, as regards the percentage of salt in the sea. The specific gravity of the sea has been shown by careful weighments to vary from 1.0246 at the poles to 1.029 in the Southern Ocean.

I have, with a view to making a liberal allowance for the comparatively fresh water about the poles and in the Black Sea, Caspian, and Sea of Azof—in case the two latter should be included in Krummel's calculation—adopted an average specific gravity for the entire ocean of 1.024, or a little less than that found by Dr. Moss near the pole during the Arctic Expedition of 1875-76.

Taking the average specific gravity at 1.024, I next find the percentage of salt as follows: The specific gravity of the Channel is 1.027. It contains 3.522 per cent. by weight soluble salts. Sodic chloride forms 2.786 parts of the 3.522, or 76 per cent. I take this 76 per cent. as being the normal or average percentage of sodic chloride to total contained salts throughout the sea, although I am aware that the proportion between sulphates and chlorides is disturbed about the north pole. Next, to find the total salts in the ocean having a mean specific gravity of 1.024, I make a sum of proportion with the specific gravity of the Channel and its known salts, and the specific gravity of the sea—27 : 24 :: 3.522—and find that the total salts amount to 3.130 per cent., of which common salt forms 2.378 at 76 per cent. of 3.130. I think that so far there is no exaggeration.

Next, to make use of Krummel's cubic miles, we must have the quantity of salt in a cubic measure of our sea water having the specific gravity 1.024. It so happens that a cubic foot of distilled water weighs at 60° F. 1,000 ounces. At the same temperature and pressure a cubic foot of the sea water, specific gravity 1.024, would weigh 1,024 ounces. As we have seen that it contains 2.378 per cent. by weight of salt, we may calculate on 24.350 ounces of salt to the cubic foot of sea. Here I drop the decimal .350 of an ounce to the cubic foot, as a further check on exaggeration. Dr. Warth states that a cubic foot of Mayomine rock salt weighs 93 lb. or 1,488 ounces. It would, therefore, require about 62 cubic feet of this sea to yield a cubic foot of rock salt.

There are 147,197,952,000 cubic feet in a cubic mile. A cubic mile of the sea water would therefore yield 2,574,160,516 cubic feet of rock salt. If we multiply this by the number of cubic miles in the ocean and divide the resultant by the number of cubic feet in a mile, we get the number of cubic miles of rock salt in the sea. Krummel's researches show that the volume of the entire sea is 3,138,000 cubic miles. The number of marine surveys which have been made of late years would enable this calculation to be made with some approach to accuracy.

$$\frac{2,574,160,516 \times 3,138,000}{147,197,952,000} = 50,612.$$

We thus get 50,612 cubic miles of rock salt in the sea at the present time.

Before passing on to make a rough estimate of the amount of salt which has been removed from the sea by solid rock salt formations, it is as well to notice Herschel's estimate of the weight of the ocean. Herschel calculated that the entire sea contained 2,494,500 billions of tons of sea water.

At 23.78, or for the sake of round numbers 24 per mille, of sodic chloride, by weight, this would yield 24,000,000 tons per billion. Multiply this by the number of billions and divide by the number of tons in a cubic mile of solid rock salt, viz., 6,111,339,079, at 93 lb. to the cubic foot, we get—

$$\frac{24,000,000 \times 2,494,500}{6,111,339,079} = 9,797 \text{ cubic miles of rock salt.}$$

It will be seen that these two estimates are widely different, the last being less than one-fifth of the first. I mention it, however, merely as a matter of curiosity, as Krummel's recent researches are undoubtedly entitled to most weight.

Of the other calculation, regarding the amount of rock salt which has been separated from the sea, there is, after all, very little to disclose. I start with Dr. Warth's estimate of 10 cubic miles of salt in the Cis-Indus salt range. The area of the range is 670 square miles and the average depth of the salt deposit is about 200 feet. It varies according to Mr. Wynn from 100 to 275 feet. If the salt lay 200 feet thick all over this area, the cubical contents would be 26 cubic miles. The salt occupies more than one-third of the whole area. The area of the Trans-Indus salt range is 1,000 square miles. Mr. Wynn calculates that one-fifth of this region or 200 square miles is taken up with salt. The depth of the deposit varies, but it reaches in some places 1,200 feet: say that it averages 800, and we get a cubical contents of 20 cubic miles of rock salt. The Carpathian salt region occupies an area of 50,000 square miles. The salt, to judge by the map, which shows salt mines at wide intervals, would occupy about one-fifteenth of this area, or 3,333 square miles. Its depth in some places is very great, over 1,200 feet; it may be assumed to average 800 feet in thickness; this would give us 416 cubic miles of rock salt. The English salt-bearing region occupies about 450 square miles. Taking one-third of it as salt deposit, with an average

thickness of 100 feet, we get about 3 cubic miles of salt. There remain the Spanish, Irish, French, Swiss, North American, Bolivian, Peruvian, Mexican, African, Chinese, Burman, and Asiatic Russian, the cubical contents of which I have no means of estimating, but, judging from analogy and general report, I cannot be far wrong in giving them each one or two cubic miles of salt, as they are local and comparatively insignificant beds, say at the outside 41 cubic miles for all. We thus get 500 cubic miles of rock salt, arranged as follows:—

Deposits.	Cubic miles.
Cis-Indus	10
Trans-Indus	20
Carpathian	416
English	3
All others	41

Doubling this for the sake of all undiscovered rock salt deposits in the earth, whether above or below the bed of the sea, we get a total of 1,000 cubic miles of rock salt. My own impression is that this calculation errs very much on the side of excess; that there is much less than 1,000 cubic miles of rock salt formation extant. Nevertheless, I leave it so, as it the better helps to prove my proposition, that the sea has not appreciably altered in salinity, since it was first formed, down to the present time, for, as before stated, the addition of 1,000 cubic miles of rock salt to the sea, would be inappreciable to animal or plant life.

J. J. L. R.

VII.

ON THE WEAPONS, ARMY ORGANISATION AND POLITICAL MAXIMS OF THE ANCIENT HINDUS, WITH SPECIAL REFERENCE TO GUNPOWDER AND FIREARMS.

CHAPTER I.

ON THE WEAPONS AND WAR IMPLEMENTS OF THE ANCIENT HINDUS.

Our knowledge of the history of the ancient Hindus is very limited, and there is not much hope of our becoming better informed, as the most important factor for providing such knowledge, *i.e.*, a historical literature or a sufficient number of authentic records is not existing in India, in fact seems never to have existed. While we possess ample material to reconstruct to some extent the history of the ancient Egyptians, Assyrians, Hebrews, Persians or Greeks, the Hindus have left us no sufficiently trustworthy records of the past, to enable us to do the same with respect to Indian history, that has been done to the history of other ancient nations.

The combined influences of climate, geographical position, political circumstances, education, religious belief, and habit have conspired to destroy any taste for historical researches, even if such had existed formerly. Internecine wars, all the more cruelly conducted, as they severed the links of previous relationship and friendship, either undertaken for the sake of

political or religious supremacy, and continual invasions of foreigners unsettling entirely all domestic affairs and civic arrangements could not excite so great an interest as to be remembered with care and committed to posterity by recording them. Nobody likes to remember saddening occurrences, and a few bright spots excepted, the political history of India reveals one of the most dismal pictures of human existence.

Moreover the exalted position in the social ladder which a Brahman occupies in his own estimation, does not induce him to interest himself in the worldly fate of others. Every Brahman regards himself as a descendant of one of the great divine sages, and obtains, if pious, final beatitude through this descent. To ensure it he has to remember and to revere the memory of his three immediate predecessors—father, grandfather, and great-grandfather; and, as every previous ancestor has observed the same practice, he is in his mind certain of his ultimate prosperity. Why should he, therefore, engage himself in the investigation of a subject in which he is not interested and which can confer on him no benefit?

The subject of Indian history is a very difficult one, not only from the absence of trustworthy ancient records, but also from the necessity—and in this respect it resembles all Asiatic history—that the historian should be an Orientalist. Historical science is strictly allied to, and dependent on, philological science, and without a knowledge of the mother tongue of a nation, or, at all events of the languages in which the original and most important sources of its history are recorded, no person is competent to undertake to write the history of a nation, for, being unable to read the original records himself, first, he is not able to judge them critically; and, secondly, it is beyond his power to detect any mistakes made by translators. Were all reports true and all translations correct, the drudgery and anxiety of a historian would be

considerably reduced, but reports and translations which fulfil these requirements are still a *desideratum*.¹

The two great epics and the purāṇas are the works which mainly represent the historical branch of Indian literature. But woe betide him who would look up to them as authentic and trustworthy sources. However important and interesting in many other respects, historical accuracy is not a quality they aim at; for they are rather a depository of legendary myths, which are enlarged by an imagination morbidly fond of wonders. Nevertheless they must not be quite thrown away as useless, for they may contain here and there some grains of historical truth, as a rock may contain some dispersed grains of gold, though they can with difficulty only be separated from their less precious surroundings. Besides the epics and purāṇas, the law books make sometimes occasional remarks which throw light on historical subjects; they together with the works on polity allow us merely an insight into the manners and customs of the old Hindus; and in this respect they are of the highest importance. In the following pages we shall discuss the customs of the ancient Indians so far as they bear on the nature of their arms. Two ancient Sanskrit works, the *Nītiprakāśikā* of Vaiṣampāyana and the *Śukranīti* of Uśanas or Śukrācārya, are in my possession which contain important, and up to the present generally unknown information on this subject, which I hope will be of interest to the reader.

¹ Yet in this time of literary upholstery people desirous of gaining literary success often overlook these facts so evident to all outsiders. A sad example of labor thus thrown away and of much patient research so fruitlessly spent, is the voluminous history of the Mongols, in the preface of the first volume of which the author, Mr. Henry H. Howorth, says that he approaches 'the problem as an ethnologist and historian and not as a linguist,' and that he had 'no access to the authorities in their original language, and only to translations and commentaries.' This confession, however honest, need not have been made, as the work itself throughout suggests by its defects the want of linguistic attainments which for a writer on oriental history is a *conditio sine qua non*.

The Nitiprakāśikā is an extract from a larger work devoted to the Nitisāstra,² which is ascribed to Vaiśampāyana, the same to whom the Yajurveda is assigned, and who recited the contents of the Mahābhārata to Janamejaya, the great-grandson of Arjuna, the son of Pāṇḍu. Vaiśampāyana is introduced in the Nitiprakāśikā as communicating at Takṣaśilā in the Panjab to the same king Janamejaya the nature of the Dhanurveda, the peculiarity of the weapons and of all the matter connected with war and the administration of the kingdom. The Nitiprakāśikā is divided into eight books, the first five speak about the Dhanurveda and weapons in general, the sixth and seventh contain remarks on the divisions and constitution of an army, and the eighth on different subjects connected with the royal prerogative and the duties of subjects.

Horace Hayman Wilson, the eminent Sanskrit scholar, has devoted a special article to "the art of war as known to the Hindus;" but this excellent essay was written many years ago and does not enter deeply into the question of gunpowder and firearms, which is particularly commented upon in the following lines.

The smallest unit of the Indian army, a *patti*, is described to consist of 1 chariot, 1 elephant, 3 horses, and 5 men. The *Senāmukha*, *Gulma*, *Gaṇa*, *Vāhini*, *Prtaṇā*, *Camā*, and *Anikini* are respectively three times as big as the corps preceding them, and the 9th formation, which was called *Akṣauhiṇī* and was considered to represent a complete army, was ten times as numerous as the preceding *Anikini*.³ The Nitiprakāśikā, after describing the original *patti*, goes on to say that a chariot has a retinue of 10 elephants, 100 horses, and 1,000 men;

² I hope soon to obtain a copy of this work, as it is in the library of one of my native friends. It is perhaps the work alluded to in the following words contained in the *Āśvalāyana Gṛhya*: "Sumantu-Jaimini-Vaiśampāyana-Pāila-sātrabhaṣya-bhārata-mahābhārata-dharmacāryaḥ."
³ *Amarakośa*, II, viii, 48 and 49; Nitiprakāśikā, vii, 5. "Eko ratho gajaścaiko naraḥ pañca hayaḥ trayāḥ."

an elephant one of 100 horses and 1,000 men; a horse one of 1,000 soldiers, and that a foot soldier had ten followers.⁴

According to the first mentioned scale the different corps would have the following strength:—

Army Corps.	Chariot.	Elephant.	Horse.	Foot.
Patti	1	1	3	5
Senāmukha	3	3	9	15
Gulma	9	9	27	45
Gaṇa	27	27	81	135
Vāhini	81	81	243	405
Prtaṇā	243	243	729	1,215
Camā	729	729	2,187	3,645
Anikini	2,187	2,187	6,561	10,935
Akṣauhiṇī	21,870	21,870	65,610	109,350

According to the second estimate one chariot alone demands an extraordinary number of supporters. And indeed the Nitiprakāśikā lays down that the various army corps should have the following constitution⁵:—

Army Corps.	Chariot.	Elephant.	Horse.	Foot.
Patti	1	10	1,000	100,000
Senāmukha	3	30	3,000	300,000
Gulma	9	90	9,000	900,000
Gaṇa	27	270	27,000	2,700,000
Vāhini	81	810	81,000	8,100,000
Prtaṇā	243	2,430	243,000	24,300,000
Camā	729	7,290	729,000	72,900,000
Anikini	2,187	21,870	2,187,000	218,700,000
Akṣauhiṇī	21,870	218,700	21,870,000	2,187,000,000

⁴ Nitiprakāśikā vii, 6-8.

6. Naga dāsa rathasyāya śatam aśvāsahanugāḥ
sahasram tu naraḥ proktaḥ parivaraḥ nṛpājñāya.
7. Ekasyaikaśya nāgasya śatam aśvaḥ prayayinaḥ
padātayaḥ sahasram tu pratyaṅgeśvanuyayinaḥ.
8. Ekasyaikaśya caśvasya sahasram tu padātayaḥ
dāsa caitan pāttin yuktva kartsnena gaṇaṇaḥ tviyam.

⁵ Nitiprakāśikā, vii, 9-11, 27-30.

9. Eko ratho dāsa gajaḥ sahasram catra vajinaḥ
lakṣasatkhyā naraḥ pātavevam agre'pi yojana.

The Hindu delights in large numbers, and to this propensity must be ascribed this exorbitant calculation. The population of the whole earth is generally assumed to amount to 1,075,000,000 souls, and in the *Nitiprakāśikā* we are told that a complete army requires a number of men, which surpasses by more than a half the number of all the inhabitants of this globe.

The *Śukraniti* gives a much more sensible distribution. According to that work the aggregate of the military unit would be 5 chariots, 10 elephants, 40 camels, 64 bulls, 320 horses, and 1,280 men.⁶

The formation of an army into different columns is a subject to which great attention was paid. Four different kinds of such columns or *vyūhas* are enumerated—the *Danda*, *Bhoga*, *Asamhata*, and *Maṇḍala*; the first had 17 varieties, the second 5, the third 6, and the fourth 2. Besides these, five most important columns were not enrolled in any of these four sets; they were called *Varāha*, *Makara*, *Garuḍa*, *Krañca*, and *Padma*.⁷

10. Pratyāṅgaistriguṇaḥ sarvāḥ kramat akhyā yathottaram anikiniṁ daśaguṇam āhurakṣauhinīm budhāḥ.
11. Senāmukhe tu guṇitāḥ trayasācīva rathā gajāḥ trīmśat trilakṣapadātāḥ trisahasram hi vājināḥ; &c., &c.
27. Akṣauhinīyām tveka vimśatsahasraṇi janādhipa tathā caṣṭasatam caiva saptatim rathagām viduḥ.
28. Aṣṭadasasahasraṇi dve lakṣe ca nareśvara tathā saptasatam caiva gajānām gaṇanā tviyam.
29. Dve koṭi caiva lakṣāṇām aṣṭadāśa mahipate tathā saptatisahasra gandharvāśśighrayayināḥ.
30. Dve carbhude ca koṭīcāpyaṣṭadāśasamiritaḥ lakṣāṇām saptatisācīva padatinām itiyati.

⁶ See *Śukraniti*, Chapter V, śloka 20, 21.

⁷ See *Nitiprakāśikā*, vi, 3-9.

2. Danda bhoga'asamhataśca maṇḍalavyūha eva ca vyūhasatvara evaite teṣu bhedān bravimyaḥam.

4. Pradaro drūhakaṣṭatyaścapabhaṣvaksireva ca vyaṇṭiṣṭhāḥ paṇḍitāḥ a syeno vijayasūjayau.

All these troops were commanded by generals, whose rank depended upon the number of troops under their orders. The ministers of the king held mostly also the office of generals.

All the soldiers, from the private to the commander-in-chief, received their pay regularly every month. The crown-prince, who was generally the next in command to the king, received every month 5,000 *varvas*, or gold coins;⁸ the commander-in-chief drew 4,000 *varvas*; the *atiratha*, the first charioteer, who was usually a royal prince, received 3,000 *varvas*; the *mahāratha* 2,000 *varvas*; the *rathika* and the *gajayodhi*, 1,000 *varvas* each; the *ardharatha* 500 *varvas*; the *ekaratha* (commander of a chariot), and the leader of an elephant got each 300 *niṣkas*. The general commanding all the cavalry obtained 3,000 *niṣkas*; the general in command of the whole infantry received 2,000 *niṣkas*. An officer commanding 1,000 men of infantry got 500 *niṣkas*; an officer who led the same number of troopers received 1,000 *niṣkas*;

5. Viśalovijayaḥ suci sthūṇo karpāścamūmukhaḥ mukhāsyovijayaśceti daṇḍasaptadaśatmakāḥ.
6. Gomūtrika hamsikā ca sañcārī śakataṣṭatathā evam karapatantiti bhogabhedāstu pañca vai.
7. Ardhaśāndrakatāddhāro vajraśśakataṣṭakastathā śrṅgi ca kakapāḍica godhiketyaparaśmṛtaḥ.
8. Asamhataḥ saḍvidhasyāt ityāhurvyūhakovidāḥ sarvabhadro durjayaśca maṇḍalopi dvidhā iti.
9. Varāhi makaravyūho garuḍaḥ krañca eva ca padmadyāścaṅgavalkalyāt etebhyaste prthak smṛtaḥ.

⁸ The value of the *varva*, which is an ancient coin, is difficult to determine. In the *Nitiprakāśikā*, VI, 89-101, the rewards which are to be given to soldiers who kill a king, a crown-prince, a commander-in-chief, a leader of an *Akṣauhinī*, a councillor, and a minister, &c., &c., are also fixed in *varvas*.

89. Dadyāt prahrṣṭo niyutam varvāṇām rajaghātine tadardhantatsutavadhe senāpativādhe tathā.

90. Akṣauhinīpativādhe tadardham paricakṣate mantryamātyavādhe caiva tadardham tu pradāpayet, &c., &c.

Śloka 89 is also found in the *Kamandakiya*, XIX, 18, having been most probably taken from this work of Vaiṣampāyana.

an officer who had 100 small pattis under his command and who must ride on a horse drew only 7 varvas, while a private got 5 suvarnas.

The following fourteen persons got only each 15 varvas a month :—1, an elephant driver ; 2, a charioteer ; 3, an ensign-bearer ; 4, a superintendent of wheels ; 5, an officer in command of 300 men of infantry ; 6, a camel-express ; 7, a messenger ; 8, the head gate-keeper ; 9, the chief-bard ; 10, the chief-singer ; 11, the chief panegyrist ; 12, the head store-keeper ; 13, the army paymaster, and 14, the muster master.⁹ The Śukraniti contains another scale of salaries.¹⁰

If this scale of salaries is correct and if the salaries were really paid, one would feel inclined to think, that an extensive gold currency existed in ancient India.

Armour was worn by the warriors, and even elephants and horses were similarly protected.

The description of the weapons which follows in this chapter is mainly taken from the Nitiprakāśikā.

⁹ See Nitiprakāśikā, VII, 33-42.

33. Yuvārājaya varvaṇam pañcasahasrakī bhṛtiḥ sarvasenāpranetre ca catuṣsahasrakī ca sa.
34. Bhṛtiscātirathe deya varvaṇam trisahasrakam maharathāya sahasradvayam rājādhimasakam.
35. Vetanam rathikāyātha sahasram gajayodhine dadyāt arddharathāyātha vetanam śatapañcakam.
36. Ekasmai rathikāyātha tadrēe gajasādhine nīkanam trisatam dadyāt yataṣtau tatkuṭumbināu.
37. Sarvāsvadhipati rājāstrisahasram sa cārhati padatādhipatiścapi dvisahasrasya bhājanam.
38. Padatanam sahasrasya netre pañcasatam smṛtam tathā cāsvasahasre sahasram vetanam bhavet.
39. Śatapatyadhipe sapta varvaṇam hayayāyine padātaye suvarvaṇam pañcakam vetanam bhavet.
40. Gajayantussarathēśca dvajāyine cakrapāya ca padātitrīsateśāya pathikostracarāya ca.
41. Varttikādhipateścapi vetrinām pataye tathā śatamāgadhavandinām pataye vivadhādhi.
42. Senāya bhṛtidhatre ca bhāṭanām ganānāpare māsi māsi tu varvaṇam daśapañca ca vetanam.

¹⁰ See Śukraniti, Chapter V, śl. 23-28.

The Hindu is fond of connecting everything, even the most material substance, with some metaphysical cause. We must not be surprised, therefore, if weapons and arms do not make an exception to this rule.

A supernatural origin is ascribed to all armour. The primeval Dakṣa had two daughters—Jayā and Suprabhā—who were given in marriage to Kṛśāśva, the mind-begotten son of Brahma. Jayā became, according to a promise of Brahma, the mother of all weapons and missiles, while her sister Suprabhā brought forth at first ten sons who were called Samhāras *restraining spells*; and afterwards through the special favor of Brahma an eleventh son, Sarvamocana (releaser of all), was born.¹¹

The knowledge of everything connected with weapons and arms is confined to the Dhanurveda, *i.e.*, the knowledge of the bow, and he only, who is well acquainted with this Veda, can hope to conquer his foes. The Dhanurveda is one of the four Upavedas. Even the gods had originally no intimate acquaintance with the precepts of the Dhanurveda, and this deficiency was one of the causes why they were at one time totally defeated by the demons or asuras. Eventually the gods were instructed in the mysteries of the Dhanurveda; and this Veda was communicated to Pṛthu by Brahma himself.

The Dhanurveda when personified is credited with possessing four feet, eight arms, and three eyes, and Sankhyāyana is mentioned as the head of his Gotra or race. In his four arms on the right he holds a thunderbolt (*vajra*),

¹¹ See Nitiprakāśikā, I, 45-47 ; II, 38.

45. Kṛśāśvo manasaḥ putro dve jāye tasya sammate jayā ca suprabhā caiva dakṣakanye mahāmāti.
46. Jayā labdhavarā matto (a) śāstrānyastrānyaśūta vai paścāt daśa parā capi tāvat putrān ajījanat.
47. Samhāran namadurdharṣan durākraman balyasah mantradaivatasaṃyogāt śāstrānyastratvam apnuvan.
38. Sarvamocananām tu suprabhātanayo mahān muktāmuktakhilāsamo madvarāt (a) prathitah parah.

(a) Brahma speaks here himself.

a sword (*khadga*), a bow (*dhanu*), and a discus (*cakra*) ; in his four arms on the left are a hundred-killer (*śataghni*), a club (*gadā*), a spear (*śāla*), and a battle axe (*pattīśa*). His crest is provided with charms ; his body is polity ; his armour is a spell ; his heart represents withdrawing spells ; his two earrings are the weapons and missiles ; his ornaments are the various war movements ; his eyes are yellow ; he is girt with the garland of victory, and he rides on a bull.¹²

The spell which effects the destruction of one's enemies and which grants victory is as follows : *Om namo bhagavate dham dhanurvedāya mām rakṣa rakṣa mama śatrūn bhakṣaya bhakṣaya hum paṭ svā hā* ; i.e., "Om salutation to the dham dhanurveda, protect, protect me, devour, devour my enemies hum paṭ svā hā." If these 32 syllables are 32,000 times repeated the supplication will be successful.¹³

The arms are divided, according to their nature, into *mukta* or those which are thrown, *amukta* or those which are not thrown, *muktāmukta* or those which are either thrown or not thrown, and into *mantramukta* or those which are thrown by

¹² See Nitiprakasika, II, 1-4.

1. Catuṣpāca dhanurvedo raktavarṇaścaturmukhaḥ aśṭabāhuṣṭriṇetraśca saṅkhyāyānasagotravan.
2. Vajram khadga dhanuścakram dakṣabāhucatuṣṭaye śataghnicā gadāśulapattīśa vāmabāhuṣu.
3. Prayogakotravanto nityaṅgo mantrakañcukah upasamhārahṛdayaścastrāstrobhayakuṇḍalah.
4. Anekavalgitakarahhaṇaṇaḥ piṅgalekṣaṇaḥ jayamālaparivṛto vṛśarūḍassa ucyate.
- ¹³ See Ibidem, II, 5-9.
5. Etamantram pravakṣyami vairijalanikṛtanam atmasainyācapakṣaṇām atmanāścābhirakṣakam.
6. Adau praṇavam uccārya na ma ityakṣare tataḥ vateti bhagapūrvam dham dhanurvedāya coccareṭ.
7. Mām rakṣa rakṣeyuccārya mama śatrūn atho vadet bhakṣayeti dviruccārya hum paṭ svā hetyathoccareṭ.
8. Aham evam raicārya gayatri chanda ucyate mahāvara devatāya viniyogo rinigrahe.
9. Dvātrimūḍavarnakamanum varṇasaṅkhyasahasrakaiḥ japitva siddhim apnoti ripūṣāpyadhiṣṭhāti.

The expression *dham dhanurveda* is formed in the same way as *Ram*

spells.¹⁴ This classification is more theoretical than practical, as it is not strictly followed. The gods can, moreover through the application of spells, turn all weapons into projectiles.¹⁵

The Agnipurāṇa arranges the weapons in five classes, into 1, those thrown by machines, *yantramukta* ; 2, those thrown by the hand, *pānimukta* ; 3, those thrown and drawn back, *muktasandhārīta* ; 4, those which are not thrown, *amukta* ; and, 5, the weapons which the body provides for the personal struggle, the *bāhuyuddha*.¹⁶ Other classifications besides these exist, but the difference between them is not essential.

Twelve projectiles and projectile weapons constitute the division of the *mukta* or thrown weapons.

1. The *dhanu* (bow) is personified as a being which has a broad neck, a small face, a slender waist, and a strong back. He is four cubits in height, and bent in three places. He has a long tongue, and his mouth has terrible tusks ; his color is that of blood, and he makes always a gurgling noise. He is covered with garlands of entrails, and licks continually with his tongue the two corners of his mouth.¹⁷

According to the rules laid down in the Dhanurveda the bow should be bent by the left hand, the bowstring should be taken by the right hand, and the arrow be placed on the

¹⁴ See Ibidem, II, 11-13.

11. Muktaṁ caivā hyamuktaṁ ca muktāmuktaṁ ataḥ param mantramuktaṁ ca catvāri dhanurvedapadāni vai.
12. Muktaṁ bānādi vijñeyam khaḍgādikam amuktakam sōpasamhāram astraṁ tu muktāmuktaṁ udaharet.
13. Upasamhārahāritam mantram uktam ihocyate caturbhirebhiḥ pādāistu dhanurvedaḥ prakāśate.

¹⁵ See Ibidem I. 47 b, note 11.

¹⁶ See Agnipurāṇa (Dhanurveda) 148, 2.

Yantramuktaṁ pānimuktaṁ muktasandhāritam tathā amuktaṁ bāhuyuddham ca pañcadhā tat prakīrtitam.

¹⁷ See Nitiprakasika, II, 17 ; and IV. 8, 9.

8. Prthugrivaṁ sukṣmasīrah tanumadhyam supṛṣṭhavat catuṣkṣkuprāṁsudeham trīṇatam dirghajihvakam.
9. Daṁṣṭrakarālavadanam raktabham ghargharasvanam antramālaparikṣiptam lelihanam ca śṛkvaṇi.

thumb and between the fingers of the bowhand on the back of the bow.¹⁸

The length of the bow, and consequently also of the arrow, varies. Two strings are generally fixed to a bow, and the archer wears on his left arm a leather protection against the bowstring, and a quiver on his back. Those well skilled in archery distinguish fourteen different movements which can be made when using the bow. In the Agnipurāṇa the bow is declared to be the best weapon.

In the law book of Manu we read, that one bowman placed on a wall can fight a hundred men, and that a hundred archers can fight ten thousand; therefore a fort is recommended. In the Śukraniti occurs the same verse but instead of the word for bow *dhanu* that for a missile *astra* is given, which imparts a wider meaning to the sentence, especially if it is taken to allude to firearms, unless *dhanu* itself stands for missile in general.¹⁹

¹⁸ Ibidem, II, 17; and IV, 11-14.

11. Dhanurvedavidhanena nāmya vāmakareṇa tat
dakṣiṇena jyāyā yojya prṣṭhe madhye pragrhyā tat.

12. Vamāṅguṣṭham tadudare prṣṭhe tu caturāṅgulih
puṅkhamadhye jyāyā yojya svāṅgulivivareṇa tu.

13. Ākarṣam tu samākṛṣya dr̥ṣṭim lakṣye viveśya ca
lakeyat anyad apasyanstu kṛtapuṅkhaḥ prayogavit.

14. Yada muñcet saram vidhye kṛtahastastadocyate
evam bāṇaḥ prayuktavyaḥ hyātmārakṣyaḥ prayatnataḥ.

¹⁹ See Nitiprakāśikā, II, 17, and IV, 18-20.

18. Lakṣyaśya pratisandhanam ākarṣaṇavikarsaṇe
paryākṣaṇanukarṣaṇa mandalīkaraṇam tathā.

19. Puraṇam sthāraṇam caiva dhūnaṇam bhṛamaṇam tathā
asannadūrapatauca prṣṭhamadhyamapātane.

20. Etāni valgitānyahuṣcaturdaśadhanurvidāḥ.

Compare Śukraniti, Chapter V, śl. 152; Agnipurāṇa, 148, 6-37; 149, 1-19.

See Manu, VII, 74, (Hitopadeśa, III, 50 Pañcatantra, I, 252).

74. Ekah śatam yodhayati prakāraṣṭho dhānurdharaḥ.

śatam daśa sahasraṇi tasmat durgam viśiṣyate.

and compare these verses with Śukraniti, IV, VI, 10.

10. Ekah śatam yodhayati durgastho'stradhara yadi
śatam daśasahasraṇi tasmat durgam samaśrayet.

2. The *iṣu* (arrow) has a dark large body; is three cubits long, an *añjali* (i.e., the hollow of the two hands) in circumference and goes very far; two movements are ascribed to the arrow.²⁰

3. The *bhīṇḍivāla* or *bhīṇḍipāla* (crooked club) has a crooked body; its head, which is bent and broad, is a cubit long, and it is a hand in circumference. It is first whirled thrice and then thrown against the foot of the enemy. When throwing the *bhīṇḍivāla*, the left foot should be placed in front.²¹

4. The *śakti* (spear) is represented as being two cubits long, with a steady sideway movement. It has a sharp tongue, a horrible claw, and makes a sound like a bell. It has an open mouth, is very dark, and is colored with the blood of the enemy. It is covered with garlands of entrails; has the mouth of a lion, and is fearful to look at. It is as broad as a fist and goes very far. It must be taken up and thrown with two hands. Its movements are of six kinds.²²

²⁰ See Ibidem, I, 17; and IV, 28, 29.

28. Iṣunilabhraddeho dviastotsedhasaṁyutah
paridhya cañjalimito'nalpaṁātragaṭistatu sah.

29. Bhṛamaṇam kṣepaṇam ceti dve gati sthūlasannate.
Compare Śukraniti, Chapter V, śl. 152.

²¹ See Ibidem, I, 17, and IV, 30, 31.

30. Bhīṇḍivalastu vakrāṅgo namraśiṣo brhacchirah
hastamātotsedhayuktah karasammitamaṇḍalaḥ

31. Tribhṛamaṇam visargaśca vāmapādapurassaran
pādaghataḥ ripuhāno dhāryaḥ padatamaṇḍalaḥ.
Compare Agnipurāṇa, 151, 15.

²² See Ibidem, I, 17, and IV, 32-35.

32. Śaktirhastadvayotsedhā tiryagatiranaḥ
tikṣṇajihvogranakhara ghaṇṭanāḍabhayaṅkari.

33. Vyādityātinilāca śatruṣonitarāñjita
antramālāparikṣiptā simhāsyā ghoradarśana.

34. Brhatsarurdūragamā parvatendravīdarīṇi
bhujadvayapreraṇiṇi yuddhe jayavidhāyini.

35. Tolanam bhṛamaṇam caiva valganam namanam tathā
mocanam bhedanam ceti ṣaṁmārgaśśaktiṣaṁvītaḥ.

5. The *drughana* (hatchet) has an iron body, a crooked neck, and a broad head. It is 50 aṅgulas long and a fist in circumference. Four movements are peculiar to it.²³

6. The *tomara* (tomahawk) has a wooden body and a metal head formed like a bunch of flowers. It is three cubits long, has a red color, and is not crooked. It is moved in three ways.²⁴

7. The *nalikā* (musket) has a straight body, is thin-limbed, and hollow in the middle. It pierces the vital parts, is dark, and discharges the missiles of the *Dronicāpa*. When it is to be used, it is taken up, ignited, and pierces the mark. These are the three actions connected with the *nalikā*.

It seems to have been a small-sized gun, a sort of carbine, as it is only described as effective against enemies standing near.²⁵

8. The *laguḍa* (club) is described as having a small foot, a broad shoulder, and a broad head. The foot part is surrounded with metal. It is small and very broad. It has the

²³ Ibidem, II. 17 ; IV. 36, 37.

36. *Drughanastvāyasaṅgasyat vakragrivo brhacchirāḥ pañcaśat aṅgulyutsedho muṣṭisammitamaṇḍalāḥ.*

37. *Unnāmanam prapātam ca sphotanam dāraṇam tathā catvāryeṭāni drughane valgitāni sritāni vai.*

²⁴ Ibidem, II. 17 ; IV. 38, 39.

38. *Tomarāḥ kṣāṇhakāyasyat lohastirāḥ sugucchavan hastatrayonnatāḥ raktavarṇastvavakraḥ.*

39. *Uddhanam vinivṛttiśca vedhanam ceti tattirikam valgitam sastratattvajñāḥ kathayanti narādhipāḥ.*

Compare Agnipurāṇa, 151, 10.

²⁵ Ibidem, II. 17 ; IV. 40, 41.

40. *Nalikā rjudaśa syat tanvaṅgi madhyarandhrika marmaschedakart nīlā dronicāpasāserinī.*

41. *Grahāṇam dhmāṇam caiva syūtam ceti gatitrayam tam sritam viditva tu jetaṣannan ripūn yudhi.*

Mallinātha uses the expression *dronicāpa* in his commentary to Nāṭyaśāstra, II, 28. *Compare p. 234.*

shape of a tooth. It has a hard body and is two cubits high. Its movements are of four kinds.²⁶

9. The *pāśa* (lasso) is composed of very small scales, made of metal. It has a triangular form, is one span in circumference, and is ornamented with leaden balls. It has three peculiar movements of its own. According to the *Agnipurāṇa* it is 10 cubits long, round, and the noose is a hand in circumference. It is not regarded as a noble weapon.²⁷

10. The *cakra* (discus) has the form of a circular disk with a quadrangular hole in its midst. Its color is like that of indigo water and its circumference amounts to two spans or 10 cubits according to the *Śukranīti*.²⁸ Five or seven motions are connected with the discus practice. It is most probably identical with the quoit still in use in some Sikh regiments and also among the troops of Native Indian princes.²⁹

11. The *dantakāṇṭaka* (tooth-thorn) is a thorn made of metal, is broad at the front, has a thin tail, and its color resembles charcoal. It is an arm high, has a good handle, is straight in

²⁶ See Ibidem, II. 17 ; IV. 42, 43.

42. *Laguḍassūkṣmapādasyat prthvamsaḥ stholaśtirākāḥ lohābeddhāgrabhāgaśca hrasvadehassupīvarāḥ.*

43. *Dantakāyo drḍhaṅgaśca tathā hastadvayonnataḥ utthānam pāṇam caiva pēṣaṇam pothanam tathā.*

Compare Agnipurāṇa, 151, 15.

²⁷ See Ibidem, II. 17 ; IV. 45, 46.

45. *Pāśassūsūkṣmāvayavo lohastustrikonavaṇ pradeśaparidhissisagulikābharāṇāñcitāḥ.*

46. *Prasāraṇam veṣṭanam ca kartanam ceti te trayāḥ yogāḥ pāśāsrita loke pāśāḥ kṣudrasamāsritāḥ.*

Compare Agnipurāṇa, 150, 2-6 ; 151, 6, 7.

²⁸ See Ibidem II. 17 ; IV. 47, 48.

47. *Cakram tu kuṇḍalākāram ante svaśrasamanvītam nīlśalilavarṇam tat pradēśadvayamaṇḍalam.*

48. *Granthānam bhramāṇam caiva kṣepaṇam parikartanam dalanam ceti pañcaiva gatayaścakrasamāsritāḥ.*

Compare Śukranīti, Chapter V, §1. 156 ; Agnipurāṇa, 151, 8.

its body, and looks frightful. Two movements are required for using it.²⁹

12. The *musundi* (octagonheaded club) has broad knots, a broad body, and a good handle for the fist. It is three arms long, and has the fearful color of a cobra. Its two principal movements are the jerking and the whirling.³⁰

B. The class of the *amukta* weapons includes twenty different species.

1. The *cakra* (thunderbolt) was, according to tradition, made out of the backbone of the sage Dadhici. It keeps its mythical character throughout. Nothing can withstand its splendour, and it was originally made for the destruction of the demon Vṛtra. It shines brightly with the light of a crore of suns, and it resembles the fire which shone at the dissolution of the world. Its fangs extend to a yojana (10 miles) in length, and its tongue too is most horrible. It resembles the night of destruction at the end of the world, and is covered with 100 knots. Its breadth amounts to five yojanas and its length to 10 yojanas. Its periphery is covered with sharp points; in color it resembles lightning; a broad strong handle is fixed to it. Its movements are four in number.³¹

²⁹ See Ibidem, II. 17; IV. 49, 50.

49. Dantakāṇṭakanāmā tu lohakāṇṭakadehavān
agre prthussūkṣmapucchaścāṅgārasanibhaktiḥ.

50. Bahūnnatasutsarūṣa daṇḍakāyo'gralocanah
pāṇanam granthanam ceti dve gati dantakāṇṭake.

³⁰ See Ibidem II. 18; IV. 51, 52.

51. Musundi tu brhadgranthirbrhaddehassusatsarūḥ
bahutrayasamutsedhah kṛṣṇasarpogravarṇavan.

52. Yāpanam ghṛṇanam ceti dve gati tat samāśrite.
Another form of the word is *brsundi*.

³¹ See Ibidem, II. 19; V. 1-6.

1. Amuktaprathamam vajram vakṣyāmi tava tacchṛṇu
aprameyā'alam vajram kāmārupadharam ca tat.

2. Dadhiciprsthasthijanyam sarvatejah prasamakam
vṛtrasuranipatartham daivatejopavṛmhitam.

2. The *ūṭi* (hand-sword) is two cubits long, has no hilt for the protection of the hand, and is black colored. The front part of the blade is curved, and it is five fingers broad. Four movements are peculiar to it.³²

3. The *paraśu* (axe) is a thin stick with a broad mouth. Its face is in front, curved like a half moon, the body is dirty colored, but the face is shining. At the foot end is the handle, and it has a head. Its height is the length of an arm. Its qualities are felling and splitting.³³

4. The *gośirṣa* (cow-horn spear) is two feet long; it is wooden in the lower parts and iron on the upper part. It has a blade, is of dark metal color, is three-cornered and has a good handle. Its height amounts to 16 thumbs; it is sharp in front and broad in the middle. Indra presented the *gośirṣa* together with a seal to Manu, and the cow-horn spear and the signet-ring became henceforth the emblems of royalty. The *gośirṣa* is handled with four movements.³⁴

5. The *asidhenu* (stiletto) is one cubit long, has no hand-guard at the handle, is dark colored, has three edges, is two

3. Koṭisuryapratikaśam pralayanalasannibham
yojanotsedhadanṣṭrābhīrjihvaya catighorayā.

4. Kālarātrinikaśam tat śataparvasamāvṛtam
pañcayojanavistāram unnatam daśayojanam.

5. Apimaṇḍalasaṁvitam paritah tikkṇakoṭimat
taṭidgaṇam ca prthunā tsarūṇa ca virājitam.

6. Calanam dhūnam caiva chedanam bhedanam tathā
valgitāni ca catvāri sadā vajram śritāni vai.

Compare Agnipurāṇa, 151, 16.

³² Ibidem, II. 19; V. 7, 8.

7. Īli hastadvayotsedha karatrarahitatsarūḥ
śyāmā bhugnāgraphalakā pañcaṅgulisuviṣṭā.

8. Sampātam samudirṇam ca nigrāhapragrahaṇau tathā
īlim etāni catvāri valgitāni śritāni vai.

³³ Ibidem, II. 19; V. 9, 10.

9. Paraśussūkṣmayastīṣyāt viśālāsyaḥ puromukhaḥ
ardhacandrāgre koṭistu malināṅgassphuranmukhaḥ.

10. Tsarupādassasīkharo bāhumatironnatākṛtiḥ
pāṇanam chedanam ceti guṇau paraśum āśritau.

Compare Agnipurāṇa, 151, 13.

³⁴ Ibidem, II. 19; V. 11-14.

11. Gośirṣam gośirah prakhyam prasāritapadadvayam
adhastat daruyantradyam ūrdhvayaphalakāñcitam.

thumbs broad, and is applicable for fighting at near quarters. It is fastened with a waistbelt and is called the sister of the sword. It requires three movements. It is worn by kings.³⁵

6. The *lavitra* (scythe) has a crooked shape, is broad at the back and sharp in front. It is black colored, five thumbs broad and one cubit and a half high. It is provided with a broad handle and is able to cut buffaloes into pieces. It is lifted with both arms and thrown.³⁶

7. The *āsīara* (scatterer, bumarang) has a knot at the foot, a long head and is a hand broad. Its middle part is bent to the extent of a cubit, it is sharp, black colored and two cubits long. Whirling, pulling, and breaking are its three actions, and it is a good weapon for charioteers and foot soldiers.³⁷

The general belief is that the bumarang is a weapon peculiar to the Australians; but this is by no means the case. It is well known in many parts of India, especially in its Southern Peninsula. The Tamulian Maravar and Kallar employ it when hunting and throw it after deer. In the

12. Nilalohitavarnam tat triraśrica susatsaru
śoḍaśaṅgulyunnatam ca tikṣṇāgram prthumadhyakam.
13. Satkṛtya manave dattam mahendreṇa samudrikam
prabhutvaścāke loke rājām gośṛṣamudrike.
14. Muṣṭigrahaḥ parikṣepaḥ paridhiḥ parikuntanam
catvāryetāni gośṛṣe valgitāni pracakṣate.

³⁵ See Ibidem, II. 19; V. 15-17.

15. Asidhenusaṁakhyatā hastaunnatyapramāpataḥ
atalatratasruyuta śyāma koṭitrayāsritā.
16. Aṅgulidvayavistṛṇā hyāsannaripughatini
mekhalāgranthini sa tu projyate khaḍgaputrika.
17. Muṣṭyagrahānam caiva pātanam kuntanam tathā
valgitatrayavyeṣa sādā dhāryā nrpottamāiḥ.
- ³⁶ See Ibidem, II. 19; V. 18, 19.
18. Lavitram bhūgnakāyam syāt prāthe guru purāśsitam
śyāmaṁ pañcāṅgulivyāmaṁ sardhahastasaṁunnatam.
19. Tsuruṇa gururṇa naddham mahiśādinikartanam
bahudvayodyamakṣepau lavitre valgite mate.
- ³⁷ See Ibidem, II. 19; V. 20, 21.
20. Āstara granthipadaśyāt dirghamaulirbṛhatkaraḥ
bhūgnahastodaraśitāḥ śyāma-varṇo dvihaṣṭakāḥ.
21. Bhṛāmaṇam karṣaṇam caiva troṭanam tat trivalgitam
jātva śaśrūṇa rāpe hanyat dhāryaśādi padatikāiḥ.

Madras Government Museum are shown three bumarangs, two ivory ones, which came from the armoury of the late Raja of Tanjore, and a common wooden one, which hails from Pudukoṭa. The wood of which the bumarang is made is very dark. I possess four black wooden and one iron bumarang, which I have received from Pudukoṭa. In the arsenal of the Pudukoṭa Rāja is always kept a stock of these sticks. Their name in Tamil is *valai taḍi* (வலை தடி) bent stick, as the stick is bent and flat. When thrown a whirling motion is imparted to the weapon which causes it to return to the place from which it was thrown. The natives are well acquainted with this peculiar fact. The length of the *āstara* or bumarang is not always exactly the same, the difference amounts often to more than one cubit.

8. The *kunta* (lance) has an iron body, a sharp top, and six edges. It is six or ten cubits high, and is round at the foot end. It is handled in six ways.³⁸

9. The *sthūna* (anvil) has a red body and many knots standing near to each other; it is as high as a man, and straight. It is whirled and fells the enemy to the ground.³⁹

10. The *prāsa* (spear) is seven cubits long and made of bamboo, which is colored red. It has a head made of metal, and is sharp at the foot end; it is adorned with silken tufts. Four movements are prescribed for it. In the Śukraniti it resembles a broad sword.⁴⁰

³⁸ See Ibidem, II. 19; V. 22, 23.

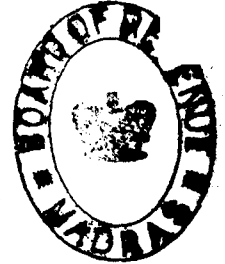
22. Kuntastvayomayāṅgasyāt tikṣṇāśṛṅgaḥ śaḍaśrmaṇ
pañcāhastasaṁutsedho vṛttapādo bhayaṅkaraḥ.
23. Uddīnam avadīnam ca nidīnam bhūmilīnakam
tiryaglīnam nikṣatam ca śaḍmārgaḥ kuntam āśritāḥ
Compare Śukraniti, Chapter V, sl. 155.

³⁹ See Ibidem, II. 20; V. 24.

24. Sthūnastu raktadehasyāt saṁpadrḍḥaparvakāḥ
pumpramāṇa rjūstasmin bhṛāmaṇam pātanam dvayam.

⁴⁰ See Ibidem, II. 20; V. 25, 26.

25. Prāstastu saptaḥastasyāt aunatyena tu vainavaḥ
lchāśṛṣṭastikṣṇapādaḥ kauṣeyastabakañcitāḥ.



11. The *pināka* or *triśūla* (trident) has three heads, is sharp in front, made of brass, has an iron head, and measures four cubits. It has a tuft made of the hair of a bear, and its neck is ornamented with brass armlets. It is shaken and impales the enemy.⁴¹

12. The *gadā* (club) is made of sharp iron, has 100 spikes at its broad head, and is covered on the sides with spikes. It is a formidable weapon, four cubits long, and its body equals a carriage axle in measure. The head is adorned with a crest; it is covered with a golden belt, and is able to crush elephants and mountains. Twenty different motions are ascribed to the *gadā*.⁴² By means of gunpowder it is thrown out of projectile weapons of various forms.⁴³

13. The *mudgara* (hammer) is small at the foot end, has no face, and is three cubits long. Its color resembles

26. Akarṣaśca vikarṣaśca dhūnanam vedhanam tathā
calasa cta gatayo rakṭaprasam samāśritāḥ.
Compare Śukraniti, Chapter V, śl. 155.

⁴¹ See Ibidem, II. 20; V. 27, 28.

27. Pinakastu trisirsasyat sitagrah kruralocanah
kāsiryakāyo lohasirṣaścaturhastapramāṇavan.

28. Rkṣaromastabakako jhallivalayagrivavān
dhūnanam mrotanam ceti triśūlam dve śrite gati.
Compare Śukraniti, Chapter V, śl. 156, and Agnipurāṇa, 151, 9.

⁴² See Ibidem, II. 20; V. 29-31.

29. Gada śaikyaśamayi śatāraprthūśirṣakā
śaṅkupravarāṇa ghorā caturhastasamunnatā.

30. Rathakṣamātrakaya ca kiritañcitamastaka
suvarṇamekhalā gupta gajaparvatābhedini.

31. Maṇḍalāni vicitrāṇi gatapratyagatāni ca
astrayantrāṇi citrāṇi sthānāni vividhāni ca.

32. Parimokṣam praharaṇam varjanam paridhavanam
abhidravapam akṣepam avasthanam savigraham.

33. Parāvṛttam sannivṛttam avaplutam upaplutam
dakṣiṇam maṇḍalam caiva savyam maṇḍalam eva ca.

34. Aviddham ca praviddham ca sphoṭanam jvalanam tathā
upanyastam apanyastam gada margāśca vināśatīḥ.
Compare Agnipurāṇa, 151, 12.

⁴³ The word Astrayantrāṇi (see v. 31-b) is explained in the old commentary accompanying the Nṭiprakāśika as "astravatagnyadinirmāṇaprayuktapreṇāṇi."

honey, its shoulder is broad, and it weighs eight loads.⁴⁴ It has a good handle, is round, black colored, and is a hand in circumference. It is whirled around and fells things to the ground.⁴⁵

14. The *sira* (ploughshare) is doubly curved, has no head, but an iron-plated front, and crushes the objects with which it comes into contact. It equals a man in height, is of agreeable color, and by means of much dragging it causes persons and things to fall to the ground.⁴⁶

15. The *musala* (pestle) has neither eyes nor head, neither hands nor feet. It is well joined together at both ends and fells and crushes enemies.⁴⁷

16. The *pattīsa* (battle axe) is of a man's height, has two sharp blades and a sharp top. Its handle has a protection for the hand. The *pattīsa* is generally called the uterine brother of the sword.⁴⁸

17. The *mauṣṭika* (fist-sword, dagger) has a good hilt, is a span long and ornamented. Its end is sharp, it has a high neck, is broad in the midst and dark colored. It can make

⁴⁴ A load or *bhāra* is generally estimated to be equal to 20 tulas = 2,000 palas of gold, or between 140—150 pounds.

⁴⁵ See Ibidem, II. 20; V. 35, 36.

35. Mudgarassūkṣmapādassyaṭ hinasirṣastrihastavān
madhuvarṇaḥ prthuskandhaścaṣṭabharaguruśca saḥ.

36. Satsarurvartulo nilo paridhya karasammitaḥ
bhramaṇam pātanam ceti dvididham mudgaraśritam.
Compare Agnipurāṇa, 151, 14.

⁴⁶ See Ibidem, II. 20; V. 37.

37. Siro divakro viśikho lohapaṭṭamukhaḥ kṣaṇ
pumpramāṇaḥ snigdha-varṇaḥ svakarṣavinipātavān.

⁴⁷ See Ibidem, II. 20; V. 38.

38. Musalastvakṣiśirṣābhyāṃ karaiḥ pādairvivarjitāḥ
mūle cāntetisambandhaḥ pātanam prothanam dvayam.

⁴⁸ See Ibidem, II. 20; V. 39.

39. Pattīsaḥ pumpramāṇasyaṭ dvidharastikṣaṣṭrṅgakaḥ
hastatrāṇasamāyuktamuṣṭīḥ khadgasahodaraḥ.

Compare Śukraniti, Chapter V, śl. 153, and Agnipurāṇa, 151, 16.

all sorts of movements, as it is a small and very handy weapon. Its qualities are enlarged upon by Vaisampāyana.⁴⁹

18. The *parigha* (battering ram) is of a round shape, as big as a palmyra-tree, and of good wood. Experts know, that a whole troop is required to make it move and strike.⁵⁰

19. The *mayūkhī* (pole) is a staff, has a hilt, and is of the height of a man. It is covered with bells, exhibits various colors, and is provided with a shield as a friend. It is used for striking, for warding off a blow, for killing, for discharging and for attacking.⁵¹

20. The *śataghni* (hundred-killer) is provided with thorns, is of black iron, and hard. It looks like a mudgara, is four cubits long, round and provided with a handle. According to Vaisampāyana it resembles in all its movements the gada, it was therefore like the gada shot out of other projectile weapons. According to others it is itself a projectile weapon, a great cannon. The name states only its destructiveness, and leaves its nature doubtful; but if it was hurled out of

⁴⁹ See Ibidem, II. 20; V. 40-44.

40. Maustikam satsarujñeyam pradesonnati bhūṣitam
śiṣṭam unnaṭagrivam prthūdaram sitam tathā.

41. Maṇḍalāni vicitrāṇi sthānāni rividhāni ca
gomotrakāni citrāni gatapratyagatāni ca.

42. Tiraścīnagatānyeva tathā vakragatāni ca
parimokṣam praharapam varjanam paridhavanam.

43. Abhidravapam aplavam adhaasthānam savigraham
parāvṛttam apavṛttam apadrutam apaplutam.

44. Upanyastam apanyastam aghatam sthālanam tathā
etani valgitanyahurmaustike nṛpasattama.

Compare Śukraniti, Chapter V, śl. 153.

⁵⁰ See Ibidem, II. 20; V. 45.

45. Parigho vartulakāraśtalamātrasutāravaḥ
balaiśasādhyaśampātāḥ tasmīn jñeyo vicakṣaṇaiḥ.

⁵¹ See Ibidem, II. 20; V. 46, 47.

46. Mayūkhī kṛtayaṣṭisṣyāt muṣṭiyukta naronnata
kinkriyasaṁvṛta citra phalika sahaśāṇi.

47. Aghatam ca pratighātam vighātam parimocanam
abhidravapam ityete mayūkhīm pañca saṁśritāḥ.

enormous tubes by means of gunpowder, it must have been a very formidable projectile.⁵²

These twenty weapons, belonging to the amukta division, are deposited in the second foot of the Dhanurveda.

All these thirty-two weapons were, according to tradition, taken from the body of the sage Dadhici. And this is the way how it happened:—

When the gods had been defeated by the demons in a great battle, which defeat they owed in some part to their insufficient knowledge of the Dhanurveda, they perceived on their flight the great sage Dadhici, who was sitting near the place they passed. To him they entrusted their arms and continued their flight until they reached the high mountain Mandara, under whose bulky body they sought and obtained an asylum. Here they rested for many years, acknowledging Indra as their immediate superior. The sage meanwhile guarded well these weapons, which through his penance had all been changed into spikes, had entered his body and had become his bones. Thus a long time passed away, until the gods became at last anxious to recover once more their lost position and to try another fight with the demons. In their dejection they appeared before Brahma, the father of all beings, and requested him to help them. Brahma, moved to pity, imparted to them the Dhanurveda, together with the spells and all the necessary implements belonging to it. Supplied with the Dhanurveda, his four feet and his six āṅgas, the gods went in search of Dadhici and requested him to surrender to them their weapons. Dadhici was quite willing to do so, even though this kindness should cost him his life, provided he were allowed to ascend to the divine heaven.

⁵² See Ibidem, II. 20; V. 48, 49.

48. Śataghni kaṇṭakayuta kalayasamayī dr̥ḍha
mudgarabha caturhastā vartulā tārūṇā yuta.

49. Gada valgitavatyecā mayeti kathita tava.

His request was granted, and Dadhici advised the gods to let a cow lick his body until the bones which represented their arms were laid free. This was done. Out of the thirty-one bones of Dadhici's body arose thirty-one weapons, and his backbone, the thirty-second bone, was transformed into the thirty-second weapon, Indra's thunderbolt.⁵³ Provided with these weapons, which had assumed the shape of the bones from which they originated, the gods went to encounter the demons again, who could not withstand this time the assault of the gods.

But the mouth of the cow, as it had been guilty of the great sin of Brahman murder, became henceforth an object of abhorrence to the pious; and up to this day orthodox Brahmans when meeting a cow, try to avoid looking at its head, and endeavour to let their eyes fall previously on the hinder part of its body.⁵⁴

One of the most important weapons, the *khadga* or *asi*, i.e., the sword, is not included in these two lists, because being created separately and specially by Brahma, it was regarded as a superior weapon altogether.

The high estimation in which the *khadga* was held by Vaisampāyana is not apparent in the Agnipurāṇa, where it is classed as a rather inferior weapon. Tradition says that it was given to Indra to be used against the Asuras. According to its nature the *khadga* belongs to the second or *amukta* class.⁵⁵

⁵³ See Ibidem II. 43-60; Mahābhārata, V, 8695; IX, 2949, &c.
⁵⁴ See Ibidem, II. 54, 55.

54. Gomukham brahmahatyapi viveśa nṛpasattama
 devasantoṣaṇāt lokān śāśvataṁ śa reiryayau.
 55. Tadaprabhṛti lokā vai na paśyantiha gomukham
 prātaḥ puruṣaśārdula taddoṣagatamanasah.

⁵⁵ See Agnipurāṇa, 148, v. 5 and 8.
 5. Khadgadikam amuktam ca niyuddham vigatayudham.
 8. Tāni khadga-jaghanyāni bahupratyavarāṇi ca.

The story goes, that when the gods were battling against the demons, there appeared through Brahma's agency on the top of the Himalaya mountain the deity of the sword, the *Asidevatā*, illuminating by its splendour the whole sky, the earth at the same time was shaking to its very foundation. The *khadga* was thus introduced into the world by Brahma for the sake of freeing the universe from the mighty demons. It was 50 thumbs long and 4 broad, and Brahma entrusted it to Śiva or Rudra. After success had attended the undertaking of Śiva, he delivered the sword to Viṣṇu, who on his side handed it over again to Marici and the other sages. One of the latter, the sage Rṣabha, gave it to Indra. Indra conferred it on the guardians of the quarters of the world, and these latter presented it to Manu, the son of the Sun, to help him in the administration of justice against evil-doers. Since that time it has remained in the family of Manu. The constellation of the *khadga* is the Kṛttikā, its deity Agni, the head of its gotra Rohiṇī, and its supreme deity is Rudra. Besides Nistṛimśā it has the eight following different names: *Asi*, *Viśamana*, *Khadga*, *Tikṣṇadharmā*, *Durāsada*, *Śrīgarbha*, *Vijaya* and *Dharmamūla*. It is handled in thirty-two different ways, and carried on the left side.

The third species of weapons, the *Muktāmukta*, those which may be thrown and not thrown are divided into two classes, into the Sopasamhāra or those which are connected with the withdrawing or restraining Upasamhāra and into the Upasamhāra themselves, which are the restrainers of the previous class.⁵⁶

Of the former there are 44 varieties, and of the latter 54.

Ibidem, 149, 7, 8; 150, 1-5; Compare Śukraniti, Chapter V, śl. 154, 155; and Nitiprakāśika III, 1-40. The third book of the Nitiprakāśika is entirely devoted to the *khadga*. Compare ibidem also, II. 12a.

12a. Muktaṁ bāpādi vijñeyam khadgadikam amuktakam.

⁵⁶ The Sopasamhāra and Upasamhāra weapons are almost identical with the lists of arms presented by Viśvāmitra to Rama as we read in the Bala-kāṇḍa (in Schlegel's edition, cantos 29 and 30; in the old Calcutta edition,

The 44 Sopasamhāra weapons are the following:—

1. The *daṇḍacakra* (discus of punishment).
2. The *dharmacakra* (the discus of right).
3. The *kālacakra* (the discus of Yama).
4. The *aindrakakra* (the discus of Indra).
5. The *śūlatara* (the spear of Śiva).
6. The *brahmaśirṣa* (the head of Brahma).

canto 26). The latter edition contains more names than Schlegel's. The enumeration contained in Vaiṣampāyana's Nitiprakāśika is independent of that of the Rāmāyaṇa, and for that very reason it is peculiarly interesting. It is therefore here given in the original; Nitiprakāśika, II. 22-37.

22. Daṇḍacakraṃ dharmacakraṃ kālacakraṃ tathaiṣa
aindrakakraṃ śūlavaram brahmaśirṣam ca modakī.
23. Śikharī dharmapāśam ca tathā varuṇapāśakam
painākāstram ca vāyavyam śuṣkādre, śikharāstrakam.
24. Krauñcāstram hayaśirṣam ca divyādive'strasañjñike
gandharvāstram nandanāstram varṣaṇam śoṣaṇam tathā.
25. Prasvāpanaprasāmane santāpanavilāpane
mathanam mānavāstram ca sāmanam tāmasam tathā.
26. Saṃvartam mausalam satyam sauram māyāstram eva ca
tvāṣṭram aṣṭram ca somāstram saṃhāram mānasam tathā.
27. Nāgāstram garuḍāstram ca śaileśikestrasañjñike
catuṣcatvārī caitāni sopasamhārakāṇi vai.
28. Vakṣyāmi copasamhāraṃ kramaprāptān nibodhame
yaṃ jñātva vairimuktāni castrāṇi śamayisyasi (*Prthu*).
29. Satyavān satyakīrtiśca rabhaso dhṛṣṭa eva ca
pratihārataraścaivāpyavāṇmukhaparāṇmukhau.
30. Dr̥ḍhanabho' lakṣyalakṣyāvavilaśca sunābhakāḥ
daśākṣasatavaktraśca daśaśirṣasatodarau.
31. Dharmanabho mahānabho dundunābhastu nābhakāḥ
jyotiṣavimalau caiva nairāśyakaśānāvubhau.
32. Yogandharah sanidraśca daityaḥ pramathanastathā
sārcirmālī dhṛtirmālī vṛttimān rucirastathā.
33. Pitryassaumanasaścaiva vidhūtamakarau tathā
karavīro dhanarati dhānyam vai kāmārūpakāḥ.
34. Jṛmbakāvarāṇam caiva mohah kāmārūcistathā.
varuṇaḥ sarvadamaṇaḥ sandhānaḥ sarpanāthakāḥ.
35. Kaṅkalāstram mausalastram kṛpālastram ca kaṅkaṇam
paiśācastram ceti pañcāpyasurastrāṇi bhūpate.
36. Satyavān sarvadamaṇaḥ kāmārūpastathaiṣa ca
yogandharopyalakṣyāscāpyasurastravighātakāḥ.
37. Catuṣcatvāriṃsat ete pañcānyonyavimardanaḥ
melayitva ca pañcāsat ekonāhyastrasamakāḥ.
38. Sarvamocananāṃ tu suprabhātanayo mahān
muktāmuktakhilāsamā madvarāt prathitāḥ pa

7. The *modakī* (the charmer).
8. The *śikharī* (the pointed).
9. The *dharmapāśa* (the noose of right).
10. The *varuṇapāśa* (the noose of Varuṇa).
11. The *painākāstra* (the missile of Śiva).
12. The *vāyavya* (the missile of Vāyu).
13. The *śuṣka* (the dry).
14. The *ārdra* (the wet).
15. The *śikharāstra* (the flaming missile).
16. The *krauñcāstra* (the Krauñca missile).
17. The *hayaśirṣa* (the horse-headed missile).
18. The *vidyāstra* (the missile of knowledge).
19. The *avidyāstra* (the missile of ignorance).
20. The *gandharvāstra* (the gandharva missile).
21. The *nandanāstra* (the joy-producing missile).
22. The *varṣaṇa* (the rainy missile).
23. The *śoṣaṇa* (the drying missile).
24. The *prasvāpana* (the sleep-causing missile).
25. The *prasāmana* (the soothing missile).
26. The *santāpana* (the tormenting missile).
27. The *vilāpana* (the wailing missile).
28. The *mathana* (the churning missile).
29. The *mānavāstra* (the missile of Manu).
30. The *sāmana* (the conciliatory missile).
31. The *tāmasa* (the missile of darkness).
32. The *saṃvarta* (the rolling missile).
33. The *mausala* (the club-shaped missile).
34. The *satya* (the missile of truth).
35. The *saura* (the missile of the sun).
36. The *māyāstra* (the missile of illusion).
37. The *tvāṣṭra* (the missile of Viśvakarma).
38. The *somāstra* (the missile of the moon).
39. The *saṃhāra* (the missile of restraining).
40. The *mānasa* (the spiritual missile).
41. The *nāgāstra* (the missile of the serpent).
- endowed with these mysterious powers (the missile of Garuḍa).
- these mysterious powers are not with

43. The *sailāstra* (the rocky missile).
 44. The *iṣikāstra* (the reed-missile).

The 55 Upasamhāra weapons are as follows :—

1. The *satyarān* (the true).
2. The *satyakīrti* (the truly-famed).
3. The *rabhasa* (the impetuous).
4. The *dhṛṣṭa* (the bold).
5. The *pratihāra* (the warding off).
6. The *avānmukha* (the downfaced).
7. The *parānmukha* (the averted face).
8. The *drḍhanābha* (the weapon with firm navel).
9. The *alakṣya* (the imperceptible).
10. The *lakṣya* (the perceptible).
11. The *āvila* (the turbid).
12. The *sunābhaka* (the weapon with good navel).
13. The *dasākṣa* (the ten-eyed).
14. The *śatavaktra* (the hundred-mouthed).
15. The *dasasirsa* (the ten-headed).
16. The *śatodara* (the hundred-bellied).
17. The *dharmanābha* (the weapon with the navel of right).
18. The *mahānābha* (the big-navelled).
19. The *duṇḍunābha* (the drum-navelled).
20. The *nābhaka* (the navelled).
21. The *jyotiṣa* (the luminous).
22. The *vimala* (the stainless).
23. The *nairāśya* (the discourager).
24. The *karṣaṇa* (the emaciating).
25. The *yogandhara* (the united).
26. The *śamīdra* (the sleeping).
27. The *daitya* (the fiendish).
28. The *pramathana* (the churning).
29. The *śroirmālā* (the garland of energy).
30. The *dhṛti* (the supporting).
31. The *mālī* (the necklaced).
32. The *ṛttima* (the abiding).

33. The *rucira* (the glittering).
34. The *pitrya* (the paternal).
35. The *saumanasa* (the good-minded).
36. The *vidhūta* (the vibrating).
37. The *makara* (the monster).
38. The *karavīra* (the scymitar).
39. The *dhanaṛati* (the desire of wealth).
40. The *dhānya* (the grain).
41. The *kāmarūpaka* (the shape-assumer).
42. The *jṛmbaka* (the gaper).
43. The *āvaraṇa* (the protecting).
44. The *moha* (the fascinating).
45. The *kāmaruci* (following one's own wishes).
46. The *vāruṇa* (the missile of Varuṇa).
47. The *sarvadamaṇa* (the all-subduer).
48. The *sandhāna* (the aimer).
49. The *śarpanāthaka* (the missile belonging to the god of serpents).
50. The *kaṅkālastra* (the skeleton missile).
51. The *mausalāstra* (the pestle missile).
52. The *kāpālāstra* (the skull missile).
53. The *kaṅkaṇa* (the bracelet weapon).
54. The *paśācāstra* (the infernal missile).

The Sopasamhāra weapons are contained in the 29th Sarga of Schlegel's edition of the Bālakāṇḍa, while the Upasamhāra weapons are mentioned mostly in the 30th canto.

The last five weapons are peculiar to the demons, while five other weapons are on the other hand most effective against these demons and cause their destruction; they are found under the numbers 1, 9, 25, 41, and 47.

These 44 Sopasamhāra and 54 Upasamhāra weapons represent the Muktaṃukta class, and they are deposited in the third foot of the Dhanurveda. They represent the belief so widely spread in India that the knowledge of certain spells endowed their owner with supernatural power, of which power these mysterious weapons are the outward token. To a person not within the pale of Brahmanism they appear like

mere creations of a fervid imagination. On the other hand the Indians do not stand alone in this belief in supernatural weapons, though it has been reserved to them only to define and to classify them methodically.

The last and most potent division, or the Mantramukta, is only represented by six weapons, but then they are so powerful that nothing can frustrate or subdue them. Their names are—

1. *Viṣṇucakra* (the discus of Viṣṇu).
2. *Vajrastra* (the thunderbolt).
3. *Brahmāstra* (the missile of Brahma).
4. *Kālapāśaka* (the noose of death).
5. *Nārāyaṇāstra* (the missile of Nārāyaṇa).
6. *Pāśupatāstra* (the missile of Paśupati).

These six weapons, which are projected by spells, reside in his fourth foot.⁵⁷

When Vaiśampāyana has finished in his second chapter the enumeration of the weapons, which he assigns to the four different classes, and has given in the following three chapters an accurate description of the sword and all the thirty-two arms belonging to the two first divisions, he remarks that the efficiency of the weapons varies and is subject to great changes. In different ages and at different places the quality of a weapon is not the same, for the mode of construction and the material out of which it is made is of a different kind. Moreover much depends on the strength and the ability of the person who uses such arms in increasing, preserving or diminishing their efficiency.⁵⁸

In addition to these weapons others were in actual use, but they are said to be specially peculiar to the lowest or

fourth age, the Kaliyuga, in which we live. Though these four ages or *yugas* are nowhere mentioned in the ancient Vedic literature, and though the constitution of the great or *Mahāyuga* is most probably an invention of a comparatively later period—perhaps after the commencement of the Kaliyuga had been connected with a certain date and the other *yugas* had been reckoned backwards from that date—it is a most singular phenomenon that many otherwise enlightened Brahmans really believe that they possess records from these previous three *yugas*.

The assumption of the depravity of the existing Kaliyuga and the superiority of the preceding ages is consoling to the feeling of those who no longer occupy the same exalted position as formerly, and who try to insinuate that the cause of the loss of their prestige is neither due to their own faults nor to the superiority of their rulers, but to the decrees of fate, to which every one is subject. We can here dispense with the presumption that the arms of any particular *yuga* are good or bad in the same proportion as the *yuga* itself is good or bad, the more so as a good and really auspicious age, from its intrinsic goodness, does not require any weapons to protect it; as in such a happy era righteousness and prosperity prevail everywhere.

But even in the Kaliyuga humanity is not so debased that no voice is raised against the use of cruel and barbarous weapons. On the other hand wherever and whenever arms are used, the object of their use must have been to apply force, either for offensive or defensive purposes. Remembering this fact one need not wonder that but little humanity is as a rule displayed in restraining the efficiency of weapons, and though, as we shall see, the ancient Hindu law books objected strongly to the use of certain arms, it is doubtful whether this prohibition was in reality ever enforced, for there exists a difference between uttering sentiments creditable to humanity and enforcing them in practice.

⁵⁷ See *Nitiprakāśika*, II. 46.

⁵⁸ *Viṣṇucakraṃ vajraṃ astraṃ brahmāstraṃ kālapāśakam nārāyaṇaṃ pāśupatam nāśāmyam itarastrakāṇi.*

⁵⁹ See *Nitiprakāśika*, V. 51.

⁶⁰ *Etāni vikṛtiṃ yānti yugaparyāyato nṛpa dehadardhyānusaṛaṇa tathā buddhyānusaṛataḥ.*

On the other hand we meet occasionally precepts which certainly do not exhibit a great amount of human kindness. Thus we read in the *Pañcatantra*: "By a wise man should an enemy be killed, even if he be his son-in-law; if no other means be possible, he who murders commits no sin. A soldier who goes to the battle does not think about right and wrong; *Dhṛṣṭadyumna* was in olden times murdered in his sleep by the son of *Drona*."⁵³

The war machines which the ancient Indians used, whether they were made of metal or of stone, and out of which they hurled iron and lead balls at their enemies, were doubtless discharged by means of gunpowder. The existence of gunpowder is intimated by *Vaiśampāyana* in his description of the *nalikā* and by the application of smoke-balls which, according to the commentator of *Vaiśampāyana*, were really made of gunpowder.⁵⁴ The ancient Hindus were also, as is well known, great adepts in the art of smelting and casting metals.

The old Hindus displayed a great ingenuity in inventing injurious and irritating compounds and refined expedients for hurling them amongst the enemy during a combat.⁵⁵

Boiling oil has been used by many nations in different parts of the globe, and the old Indians believed also in its efficacy, but they used besides explosive oil. The resin of the *Śal* tree (*Shorea robusta*), which resin is also called *kalakala*, is recommended likewise. The casting of melted sugar is mentioned as well as that of heated sand. Pots filled with venomous snakes mixed together with honey, spikes and big stones, saws, smoke-balls, burning husks of corn, and other injurious preparations were frequently employed in India.

⁵³ See *Pañcatantra*, I. 299, 300.

⁵⁴ *Dhumagulika* is explained by *Cārnagola*, powderball.

⁵⁵ See *Nītiprakasika*, V. 52.

52. *Yantrāṇi lobhasānam gulikakērpakāṇi ca tathā copalayantrāṇi kṛtrimaṇyaparāṇi ca.*

The soldiers of *Duryodhana*, when encamped in *Kurukṣetra*, had at their disposal similar implements of war.⁵⁶

These weapons and mixtures were probably used more generally during sieges and in street-fights than in open combat.

The weapons just now enumerated and many others of the same objectionable and cruel type are ascribed to the depravity of the *Kaliyuga*, when war is conducted in an unfair, mean, and deceitful manner. The existence of many uncivilized nations of the lowest origin contributes greatly to the degeneration of the times. Among the despicable peoples thus enumerated are found the *Huns*, *Pulindas*, *Śabarās*, *Pahlavas*, *Śakas*, *Mālavas*, *Varvaras*, *Koṅkaṇas*, *Āndhras*, *Colas*, *Pāṇdyas*, *Keralas*, *Mlecchas*, *Caṇḍālas*, *Śvapacas*, *Khalas*, *Mavellakas*, *Lalitthas*,⁵⁷ *Kirātas*, and *Kukkuras*. To add insult to injury, and to show the low position of these nations, the Hindus said these tribes originated from the vagina of a cow.⁵⁸

⁵⁶ See *Ibidem*, V. 53, 54.

53. *Kūṭayuddhasahāyāni bhaviṣyanti kalau nṛpa taptatāilam sarjarasam guḍalalo gravaluka.*

54. *Madhusasivāghataḥ śilakāni brhacchilāḥ krakacā dhūmagulikāḥ tuṣāṅgarādikam tathā.*

Compare, *Mahābhārata*, *Udyogaparva*, *Adhyāya*, 155, 5-7.

5. *Sakacagrahaviḥsepāḥ satailaguḍavalukāḥ sāsivāghataḥ sarve sarjarasapāṇsavah.*

6. *Saṅghatāphalakāḥ sarve sayoguḍajalopalāḥ sāsālabhindipalāśca samadūcchistamudgarāḥ.*

7. *Sakāṇḍadandakāḥ sarve sasiraviṣatomarāḥ. saśūrpapitākāḥ sarve sadātṛāṅkuśatomarāḥ.*

⁵⁷ See *Ibidem*, V, 55-57.

55. *Hunāḥ pulindāḥ śabarā varvara pahlavāḥ śakāḥ mālavāḥ koṅkaṇā hyandhrāḥ colāḥ pāṇdyāḥ sakeralāḥ.*

56. *Mlecchā goyonayāścānye caṇḍalāḥ śvapacāḥ khalāḥ mavellakā lalitthāśca kirātāḥ kukkurāḥ tathā.*

57. *Papā hyete katham dharmam vetsyanti ca viyonayāḥ saṅkaryadoṣanirata bhaviṣyantyadhame yuge.*

⁵⁸ Most of these names appear also in the *Mahābhārata* and *Rāmāyaṇa*. The Hindus call the modern Europeans, *Huns*, this expression most probably arose from the idea that the ancient Hunnish invaders came also from Europe. The 14th Chapter of the *Harivamśa* contains an enumeration of many barbarous nations.

• CHAPTER II.

ON THE AUTHENTICITY OF THE ŚUKRANĪTI.

The reputed author of the Śukranīti—a chapter from which on the army organisation and the political maxims of the ancient Hindus we shall give further on in these pages—is Uśanas or Śukra. He is also called Maghābhava, Kavi, Kāvya, Bhārgava, Śoḍaśārcis, Daityaguru, and Dhiṣṇya.⁶⁵ According to some he is the son or descendent of Bhṛgu, and, therefore, he is named Bhārgava; to others he is known as Kavi or the poet, and to others also as Kāvya, the son of Kavi, a son of Bhṛgu. He is regarded as the regent of the planet Venus or Śukra; and the Śukravāra or Friday is named after him; his connection with this planet is also evident in his names Maghābhava, Śoḍaśārcis, and Dhiṣṇya. Moreover he is the preceptor of the Daityas or Demons and is called therefore Daityaguru. Brhaspati, the preceptor of the gods and the regent of the planet Jupiter, is like Śukra the author of a famous Dāṇḍanīti, or a work on civil and military administration. This work of Śukra is highly praised in the Kāmandakiya, as containing the principles of all sciences, and its śloka are very often found in the Kāmandakiya.⁶⁶

Throughout Indian literature Śukra is always upheld as one of the greatest sages, his sayings are carefully noted and quotations from his Essence of Polity or Nītisāra are met with in the most ancient and celebrated writings.

⁶⁵ See "Śukro Maghābhavaḥ Kāvya Uśana Bhārgavaḥ Kaviḥ Śoḍaśārcis Daityaguruḥ Dhiṣṇyaḥ," in Hemacandra's *Anekārtharatnamālā*, II, 33 and 34; compare Amarakoṣa, I, 1, 26; and Halāyudha's *Abhidhanaratnamālā*, I, 48; &c. &c.

⁶⁶ See Kāmandakiya, II, 4, 5.

4. Vāta ca dāṇḍanītiśca dve vidye ityavasthite
lokasāyarthapradhānatvat śiṣyaḥ surapurodhasaḥ.

5. Ekaiva dāṇḍanītiśtu vidye tyauśanasi sthitiḥ
tasyam tu sarvavidyānam ārambhāḥ samudāhṛtaḥ.

The reason of calling Śukra's work a *Dāṇḍanīti* is explained in Śukranīti, I, 157, as follows:—

Dando danda iti khyātastasmāt dāṇḍo mahipatīḥ
tasya nītidāṇḍanītināyānāt nītirucyate.

The author of the Śukranīti is very frequently mentioned in the Mahābhārata. In one place we read that Brahma wrote the first Dāṇḍanīti which contained the enormous number of 100,000 chapters. This bulky volume was reduced by Śāṅkara or Śiva into a code called Viśalakṣa which still comprehended 10,000 chapters. Indra reduced the Viśalakṣa into the Bahudāṇḍaka which reached the respectable number of 5,000 chapters. Indra was followed by Brhaspati, whose Brhaspatya amounted to 3,000 chapters. Kāvya or Uśanas thinking that the life of man was too short to digest such enormous books limited his Nītisāra to 1,000 chapters.⁶⁷ It was thus Uśanas, who made the Dāṇḍanīti accessible to men.

⁶⁷ See Mahābhārata, Śāntiparva, Rajadharmā, LIX, 28, 29, 76-87.

28. Tan uvāca surān sarvān Svayambhūḥ bhagavānstatāḥ
śreyo'ham cintayisyāmi vyetuvobhīḥ surarṣabhaḥ.
29. Tatodhyāyasahasraṇām śatam cakre svabuddhijam
yatra dharmastathāivārthaḥ kamaścaivabhiḥvarpitāḥ.
76. Etat kṛtvā subham śāstram tataḥ subhagavān prabhuḥ
devān uvāca sathhrṣṭaḥ tataḥ Śakrapurogamān.
77. Upakāraya lokasya trivargasthāpanāya ca
navanītam sarasvatya buddhireṣa prabhāvita.
78. Dāṇḍena sahitāhyeṣā lokarākṣanakārika
nigrahanugraharata lokān anucariṣyati.
79. Dāṇḍena nīyate cedam dāṇḍam nayati vā punaḥ
dāṇḍantīriti khyāta trilokān abhivartate.
80. Śaḍgunyagūṇasāraṣa sthāsyatyagre mahatmasu
dharmarthakāmamokṣāśca sakalā hyatra śabdītaḥ.
81. Tatastān bhagavān nītim pūrvam jagraha Śāṅkaraḥ
bahurūpo viśalakṣaḥ śivassthanurumapātīḥ.
82. Prajānam ayuśohraṣam vijñāya bhagavān Śivāḥ
sañcikṣepa tataḥ śāstram mahārtham brahmaṇa kṛtam.
83. Viśalakṣam iti proktam tad idam pratyapadyata
daśādhyāyasahasraṇi Subrahmaṇyo mahātapaḥ.
84. Bhagavān api tacchāstram sañcikṣepa Purandaraḥ
sahasraḥ pañcabhis tāta yaduktam bahudāṇḍakam.
85. Adhyāyanām sahasraistu tribhireva Brhaspatīḥ
sañcikṣepaśvaro buddhya Brhaspatyam yaducyate.
86. Adhyāyanām sahasreṇa Kāvyaḥ sañkṣepam abravīt
tacchāstram amṛtoprajño yogācāryo mahāyasaḥ.
87. Evam lokanurodhena śāstram etanmaharṣibhiḥ
sañkṣiptam ayurvijñāya martyānām hrāsam eva ca

According to the *Nītiprakāśikā* Brahma, Rudra, Subrahmanya, Indra, Manu, Brhaspati, Śukra, Bhāradvāja, Gaurasīras and Vyāsa were authors of works on polity. Brahma's *Dandaniti* contained 100,000 chapters, that of Rudra 50,000, that of Subrahmanya 25,000, that of Indra 12,000, that of Manu 6,000, that of Brhaspati 3,000, that of Śukra 1,000, that of Bhāradvāja 700, that of Gaurasīras 500, and that of Vedavyāsa 300 chapters.⁶⁸

In the second Śloka of the Śukraniti we read that Brahma's work consisted of ten millions of double verses, which would give to each chapter an average length of 100 Ślokas.⁶⁹

Just as the *Mānavadharmasāstra* does not contain as many verses, as are said to have been originally in it, so also is the Śukraniti we actually possess by no means as long as is indicated in the *Mahābhārata*. In fact at the end of the 4th section the Śukraniti is declared to be only 2,200 Ślokas

⁶⁸ See *Nītiprakāśika*, I, 21-28.

21. Brahma mahesvarah skandas cendrapracetaso manuh
brhaspatisca sukraśca bharadvajo mahatapah ;
 22. Vedavyasaśca bhagavan tatha gaurasira munih
ete hi rajasastanam pranetarah parantapah.
 23. Lakṣadhyāyān jagau brahma rajasastre mahamatih
pañcāśat ca sahasraṇi rudrah saṅkṣipyā cabravat.
 24. Pañcaviṃśat sahasraṇi skandas saṅkṣipyā cavadat
daśadhyāyasahasraṇi dviśahasre ca vāsavaḥ.
 25. Pracetasamanuścāpi satsahasraṇyathabravat
trīṇyadhyāyasahasraṇi brhaspatiruvaca ha.
 26. Kavyastu tat samalodya cakre dhyāyasahasrakam
saptadhyāyasatam śāstram Bhāradvājasatathabhanat.
 27. Munirgaurasiraścāpi pañcadhyāyasatam jagau
vedavyāsaśtu bhagavan tat saṅkṣipyā mahamatih
 28. Śatatrayadhyāyavatim nitim cakre mahamate
saṅkṣiptam ayurvijñāya martyānam buddhidōṣataḥ.
- ⁶⁹ See Śukraniti, I, 2-4.
2. Purvadevairiyathanyāyam nitisaram uvāca tan
śatalakṣaślokanitam nitiśāstram athoktavān.
 3. Svayambhūr bhagavan lokahitārtham saṅgrahena vai
tataśram tu Vasīṣṭhadyairasmābhīrvrddhihetave.
 4. Alpāyubhābhīrtadyartham saṅkṣiptam tarkavistṛtam.

long, and it speaks well for the preservation of this ancient work, that though the MSS. differ as to their length in some way or other, the variations in them are not very great. One MS. contains indeed exactly 2,200 ślokas, and all MSS. I possess contain the above verse in question, which thus defines the proportions of the Śukraniti.⁷⁰

In the beginning of the 58th Chapter of the *Rājadharmasāstra*, the name of Kāvya occurs also as one of the authors of a *Dharmasāstra*, and he is likewise mentioned as such in the second Śloka of the *Pañcatantra*.⁷¹ The *Kāmandakiya* and other similar works allude repeatedly to our author. It is a peculiar coincidence that the reason for composing the Śukraniti is the same both in the Śukraniti and in the *Mahābhārata*. If the former were a later production the cause of this agreement would be evident, but there are many good grounds for the supposition that this is not the case, and that the quotations from Śukra's work on Polity found in such ancient works as the *Mahābhārata*, *Harivaṃśa*, *Kāmandakiya*, *Pañcatantra* are genuine quotations. A few examples taken at random will be sufficient for our purpose.

The *Mahābhārata* quotes in the 56th Chapter of the *Rājadharmānuśāsana* the following as the saying of Uśanas : " A law abiding king should in the exercise of his duties chastise a Brahman, who has even read the whole Veda, who

⁷⁰ See Śukraniti, IV, VII. 346.

Manvadyairadrto yorhastadartho Bhārgaveṇa vai
dvaviṃśatisatam śloka nitisare prakīrtitaḥ.

⁷¹ See *Rājadharmasāstra*, LVIII, 1-4.

1. Ete te rāja dharmānam navanitam Yudhiṣṭhira
Brhaspatirhi bhagavan nānyam dharmam praśaṃsati.
 2. Viśalakṣaśca bhagavan Kāvyaścaiva mahatapah
sahasrakṣo Mahendraśca tatha Pracetaso Manuh.
 3. Bhāradvājaśca bhagavan tatha Gaurasira munih
rajasastrapranetarō brahmanya brahmavādinah.
 4. Rakṣam eva praśaṃsanti dharmam dharmavṛtam vara.
- See also *Pañcatantra*, I, 2.
Manave Vacaspataye Śukrāya Parāśarāya sasutāya
Canakya ya ca viduṣe namo'stu nayaśāstrakartṛbhyaḥ.

approaches with uplifted weapons and intent to murder. The king knowing the law should certainly protect the law which is being broken. By such an act he is no law-breaker; for fury recoils on fury." Our Śukraniti expresses this decision (IV, VII, 259) as follows: "He who has raised a weapon against an approaching assassin, even if this be a Vaidika Brahman (Bhrūṇa), and has killed him, should not be considered as a murderer of a Vaidika Brahman; if he has not killed him, he should be regarded as such."⁷²

As the śloka of the Śukraniti contains a more difficult reading and the rare term Bhrūṇa in the sense of Vaidiki-brahman occurs here, which is, as it were, explained in the Mahābhārata by "Vedāntapāraṅga," there seems to be no doubt which of the two versions is the earlier.⁷³

The 57th chapter of the Rājadharmā begins with another quotation of Uśanas. He is said to have declared that "the earth swallows these two, namely, a king who does not oppose an enemy and a Brahman who does not travel about, like a snake swallows the animals living in holes."

⁷² See Mahābhārata, Rājadharmā, LVI, 27-29.

27. Śloka causanāṣa gītau purātāta maharṣiṇā
tau nibodha maharāja tvam ekāgramāna nṛpa.

28. Udyamya śāstram āyāntam api vedāntapāraṅgam
nigrahniyāt svadharmena dharmāpekṣi naradhipaḥ.

29. Vināśyamanam dharmanam hi yo'bhīrakṣet sa dharmavit
na tena dharmahā sa syāt manyustanmanyuṃ rēchati.

Compare this with Śukraniti, IV, VII, v. 259.

Udyamya śāstram āyāntam bhrūṇam apyātātayinam
nihatva bhrūṇahā na syāt ahatva bhrūṇahā bhavet.

Compare further with these ślokas, Manu, VIII, 350, 351.

⁷³ That *Bhrūṇahā* means a Vaidika-Brahman murderer is clear from Kullakabhaṭṭa's Commentary to Manu, VIII, 317 (annāde bhrūṇahā māṣṭi patyau bharyāpacarini), for he says there: "Brahmahā yaḥ tatsambandhiyo'nnam atti tasmin asau svapāpam saṅkramayati. Bhrūṇahānabhoktuḥ papam bhavattī. Etad atra vivakṣitam na tu bhrūṇahānaghnaḥ papam naśyati tatha bharyā vyabhi-carini jārapatim kṣamamāṇe bhartari papam samsleṣayati."

Compare also *Nānārtharatnamālā* by Irugapadāṇḍhinātha, II, 125, under the word bhrūṇa "Bhrūṇorbhake straiṇagurbhe garbhīṇyam śrotṛiye dvije."

The Śukraniti contains (IV, VII, 242) this very śloka.⁷⁴

The Harivaṃśa ascribes to Uśanas the wise prescription, that one should never confide in a person whose trustworthiness one has not proved previously, and even to be cautious in giving confidence to a trustworthy person, as the evils of misplaced confidence are serious. This very sentiment, though not quite in the same words, may be found in Śukraniti III, 47-49.⁷⁵

It is peculiar that the Pañcatantra refers these verses on the acquisition of friends to a passage in the Śukraniti, and here,

⁷⁴ See Rājadharmā LVII, 1, 2.

1. Bhagavān Uśanā hyaha ślokaṃ atra viśampate
tad ihaikamaṇā rājan gadatastaṇṇibodhame.

2. Dvāvimau grasate bhūmiḥ sarpo vilāṣayan iva
rājanam cāvīyoddhāram brahmanam capravāsinam;
in its stead we read in the Śukraniti, IV, VII, 242:
Rājanam capayoddhāram brahmanam capravāsinam
nirgilati bhūmiretau sarpo vilāṣayan iva.

⁷⁵ See Harivaṃśa XVIII, 127-131.

127. Kusauhydena viśvasaḥ kudeśena prajīvyate
kurājani bhayam nityam kuputṛe sarvato bhayam.

128. Apakarini visrambham yaḥ karoti narādhamah
anātho durbalo yadvannaciram sa tu jīvati.

129. Na viśvaset avīśvaste viśvaste nātivīśvaset
viśvastāt bhayam utpannam mūlānyapi nikrintati.

130. Rājaseveṣu viśvasam garbhasaṅkramiteṣu ca
yaḥ karoti naro mūḍho na ciram sa tu jīvati.

131. Abhyunnatim prāpya nṛpaḥ prāvaram kiṭako yatha
sa vināśyatyasandeham āhaivam Uśanā nṛpa.

See also Pañcatantram II, 45, and Kamandakiya, V, 88, 89.

The Śukraniti expresses in the following ślokas, III, 75-80, the same idea:—

75. Bhṛtyo bhrātṛi va putrah patni kuryat na caiva yat
vidhāsyanti ca mitrāni tat kāryam avīśankitam.

76. Ato yateta tat prāptyai mitralabdhirvarā nṛpam
natyantam viśvaset kañcit viśvastam api sarvada.

77. Putram va bhrātaram bhāryam amatyam adhikāriṇam
dhanastri rājyalobho hi sarveṣam adhiko yataḥ.

78. Prāmāṇikam cānuḍhātam aptam sarvatra viśvaset
viśvasitvatmavādgnḍhastat kāryam vimṛset svayam.

79. Tadvakyam tarkato'nartham viparitam na cintayet
catuṣṣaṣṭitamāṇsam tannāśitam kṣamayet atha.

80. Svadharmanitibalavaṇ tena maitrim pradharayet
śānairmanāisā satkāraḥ supūjyaṃ pūjayet sadā.

III, 76, we find them occurring in connection with this particular subject, the acquisition of friends.⁷⁶

The following Śloka in the Harivaṃśa, which is found a little modified in the Pañcatantra, III, 256, is also ascribed to Uśanas :—" The residue of an enemy, of debt, of fire, O prince ! (although scattered) when united, may grow again ; therefore one should not allow a residue to remain." The Śukranīti contains nearly the same idea in the same words.⁷⁷

The Kāmandakiya (XII, 67) says that Manu mentions in his law book, that the number of ministers at the court of a king amounts to 12, that Brhaspati says it amounts to 16, and that Uśanas fixed it at 20.⁷⁸

In the Śukranīti II, 69 and 70 are as a matter of fact 20 ministers mentioned ; *e.g.*, the family priest, vicegerent, chief secretary, war minister, diplomatist, chief justice, learned adviser, finance minister, councillor and ambassador ; each of these 10 has a substitute, so that the entire number of ministers amounts to 20.⁷⁹

⁷⁶ See Pañcatantram, II, 47.

Sukṛtyam viṣṇugṛptasya mitrāptibhārgavasya ca
brhaspater avisvāso nṛtisandhistridhā sthitah.

⁷⁷ See Harivaṃśa, XVIII, 136, 137.

136. Na ca śeṣam prakurvanti punarvairabhayaṁ naraḥ
ghātayanti samūlam hi śrutvemaṁ upamaṁ nrpa.

137. Śatruśeṣam rṇaśeṣam śeṣam agneśca bhūnrpa
punarvardheta sambhūya tasmāt śeṣam na śeṣayet.

Compare Śukranīti, III, 101-103.

101. Sarpo'gnirdurjano rāja jāmātā bhāginisutah
rogah śaturnāvamaṇyopyalpa ityupacārataḥ.

102. Krauryat taikanyadusevabhavat svāmitvāt putrikābhayaṁ
svapurvajapiṇḍadatvāt vṛddhibhūya upacaret.

103. Rṇaśeṣam rogaśeṣam śatruśeṣam na rakṣayet
yacakadyaiḥ prārthitasean na tikṣṇam cottaram vadet.

⁷⁸ Dvādaśeti Manuḥ prajāśodāseti Brhaspatih
Uśana viṃśatirīti mantrināṁ mantramāṇḍalam.

⁷⁹ The śloka in question are as follows :—

69. Purodhāca pratidhīḥ pradhānaścaivastathā
mantrīca prāhivivakaśca paṇḍitaśca sumantrakah ;

70. Amātyo dūta ityeta rājāḥ prakṛtayo daśa
daśamanśadhikah pūrvam dūtāntah kramāśah smṛtah.

The Kāmandakiya (VIII, 22-23) ascribes to Uśanas the observation that the sphere round a king consists of twelve other kings of whom 4 are enemies, 4 friends and 4 neutrals.

A king X, *e.g.*, is surrounded by three circles A, B, C, and in these circles resides one king in each of the four directions of the compass. Immediate neighbours are always hostile to each other, thus a king of the A line is an enemy to his neighbour in the B line, and the same feeling animates B towards his neighbour in C. As X is an enemy to the kings of the A line and the latter are enemies to the kings living in the B circle, X and the B kings become friends by being bound together by their hostility to the A kings, and X and the C kings are neutrals as, they have no interest in common, being too distant from each other. This very idea is well expressed in the Śukranīti, IV, I, 17-18.⁸⁰

The whole Śukranīti is divided into four sections with a fifth supplementary section at the end.

The first section treats on the duties of a king ; the second on the position of the crown prince ; the third mainly on income and expenditure on servants and wages ; the fourth is divided into seven chapters, treating respectively 1, on friendship and (enmity), 2, on the treasury, 3, on administration, 4, on revenue, arts and science, 5, on social laws, 6, on fortresses, and 7, on the army.

This last chapter is given afterwards entirely. It begins with a definition of the word army, goes on to state the different character of the troops ; the mode of their movements, whether they march on foot, ride on horses and

⁸⁰ See Kāmandakiya, VIII, 22, 23.

22. Udaśino madhyamaśca vijigṛṣṭu maṇḍalam
uśana maṇḍalam idam prajā dvādaśarājakam.

23. Dvādaśānam narendranāṁ arimitre prthak prthak ;
and Śukranīti, IV, I, 17, 18.

17. Āsamantāt caturdikṣu sannikṛṣṭaśca ye nrpāḥ
tatparastatpara ye'nye kramāt hinabalarayaḥ.

18. Śatrudāśinamitrāni kramāt te syustu prakṛtāḥ
arimītram udaśino' nantarastatparasparam.

elephants, or are driven in carriages. Then follows a description of the various kinds of soldiers, and afterwards a description of the animals and conveyances used for army purposes. This is succeeded by a classification of the arms used in warfare and such arms are described. Among these are mentioned firearms and a full account is given of the manufacture of gunpowder.⁸¹ These two subjects will be discussed at large hereafter. After the description of weapons is finished, the different modes of warring, marching, and treating are gone into, and the political conduct of the king is described at length. No undue preference is given to any peculiar subject in particular, and this, if no other proof had been forthcoming, speaks for the genuineness of the work.

It is hardly imaginable that a work, which contains so many important revelations about the ancient state of the civil and military administration of India, and which is, as we have seen, often quoted by works of undisputed antiquity and genuineness—quoted too in a manner which precludes forgery, as the quotations are seldom quite literal—should have been written for the sole object of braggadocio, in order to prove to Europeans the mental superiority of the ancient Hindus by ascribing to them the original invention and manufacture both of gunpowder and firearms, and that the very object of the forgery, its *raison d'être*, should have been frustrated afterwards by keeping the work so zealously secret that except to a few initiated pandits, it was totally unknown to the public!

On the other hand would it not be a subject worthy of investigation for those who doubt the authenticity of the Śukraniti to prove its spuriousness, and to refute the statements brought forward in favor of its genuineness? Mere assertions do not possess any scientific value.

⁸¹ Gunpowder and firearms are incidentally mentioned also in other parts of the Śukraniti but in this chapter both are described fully.

The language is simple, terse and antiquated, and in many instances the age of the work manifests itself in this respect. The Śukraniti contains also a large number of half verses and this is another circumstance speaking for its antiquity. In some places it contradicts the precepts of Manu, and as it is not likely that any Hindu would dare to oppose that most venerated law book, we may conclude that the compilation of our work is anterior to or at least contemporary with our revision of Manu's Dharmasāstra.

Śukra is regarded as the preceptor of the Demons, and though this tradition should be received *cum grano salis*, nevertheless the work written by or ascribed to him may have been regarded as the special law book of the warriors or Kṣatriyas. It was also for this reason originally not much patronised by the Brahmans, but now it is held in great respect by them.⁸²

CHAPTER III.

ON THE USE OF GUNPOWDER AND FIREARMS IN GENERAL.

No invention has, within the last five hundred years, been so influential in shaping the destinies of nations as the introduction of gunpowder and of firearms into warfare. The fate of whole realms depended, and depends to a certain extent even now, on the proficiency attained by the comba-

⁸² A copy of the Śukraniti was bought for the Government MSS. Library by my predecessor Mr. Śeṣagiri Śāstri as far back as 1871, but as long as I could consult only this copy, I could not well attempt to print it. Since that time I have received three more Manuscripts of this work from other parts of the country, which, though coming from different places and being written in different characters, are in very close agreement. A printed specimen published a few years ago by H. H. the Holkar has also come into my hands, and though it is a print abounding with mistakes, it serves me as another Manuscript.

The Śukraniti is now very scarce, and its owners do not like to part with it. I have therefore been obliged to get two MSS. copied, as I could not obtain the originals.

tants in the manufacture of better gunpowder or of projectile weapons of superior quality.

When missiles despatched from projectile weapons by means of gunpowder easily penetrated the knights clad in their strongest suit of armour, while the persons who used those arms were quite beyond the reach of their physically perhaps stronger foes, no wonder that armour was discarded in course of time, and the mediæval knight, who had hitherto without much difficulty maintained his supremacy single-handed against a multitude, found his former superiority gone, and disappeared gradually from the scene. Fortresses, which, before the invention of gunpowder, had been regarded as impregnable, lost their reputation as safe strongholds, and new schemes and practices had to be devised to obviate the difficulties of the altered situation.

Slight improvements in the construction or manipulation of firearms produced often most important alterations in the political history of the world. Frederick the Great is said to have owed in his earlier campaigns many of his victories to the quicker mode of loading adopted by the Prussian army; and it is not so long ago that we ourselves have witnessed a rearrangement of the map of Europe, partly effected by means of superior weapons being used by one nation against another. It is therefore natural that a general interest should be more or less taken in all important advances made in this subject, which, if well studied and applied, provides a nation with the means of ensuring its freedom, independence, and supremacy, so long as actual strength is regarded as the only recognized claim to independent political existence.

The invention of gunpowder has been ascribed to different individuals belonging to different countries, and as the question as to its authorship and antiquity is still an open one, we shall discuss this mooted point and shall endeavour to prove that the oldest documents mentioning and describ-

ing gunpowder are found in India and written in Sanskrit, and that the use of gunpowder and its application to the discharge of missiles from projectile weapons was a well known fact in ancient India, corroborating so far the opinion of those who always pointed out India as the original seat of its invention. The question whether China received the knowledge of gunpowder from India, or *vice versâ*, cannot be touched here, as there do not exist any trustworthy documents bearing on this question. No Chinese work on this question can, with respect to antiquity, be compared with the Śukraniti, so that even if the Chinese should have independently invented gunpowder, the claim as to priority of invention will certainly remain with India.

A Franciscan monk, Berthold Schwarz, whose real name was Constantin Ancklitz or Anklitz, is generally, especially in Germany, credited with the invention of gunpowder, which, according to tradition, was made at Freiburg in the Breisgau about the year 1330. No doubt Black Barthel, *der schwarze Barthel*, as he was popularly called, dabbled in alchemy and was very fond of chemical experiments, during one of which he was blown up and nearly killed by an explosion of a mortar he was experimenting upon. Eventually he was accused of practising magic and necromancy and sent to prison. A grateful posterity erected in his honour a statue on the spot where the Franciscan Convent of Freiburg had once stood; an honour which he may have richly deserved for many reasons, but surely not for being the original inventor of gunpowder.

Many years previously to Berthold Schwarz, another Franciscan monk, Roger Bacon (1214-94), the Doctor Mirabilis of Oxford, had already pointed out the peculiar qualities of saltpetre, as exemplified in the action of gunpowder. Like every chemical scholar in those times he became an object of clerical suspicion, was incarcerated by his superiors on the plea of practising forbidden magic and

though for a time released by Pope Clement IV, he was again imprisoned under Pope Nicholas III. Bacon suggests that gunpowder should be used in war, as it would supply a powerful means for the destruction of hostile armies. He notices particularly the thunderlike noise and lightninglike flash at the time of its explosion; its application to crackers and fireworks is a subject, he was well acquainted with. He states in his book on the secret works of art and nature two of the principal ingredients which compose gunpowder—saltpetre and sulphur—but not wishing, according to the mysterious inclination of those days, to make the secret known, he uses in his prescription the obscure expression *lura nope cum ubre*, which has been later ingeniously found out to stand for *carbonum pulvere*.⁸³

It is now generally supposed that Roger Bacon learnt the secret of the manufacture of gunpowder while he was travelling in Spain, where it was pretty well known among the Moors, who were not only the most learned nation at that period, but who, through religious and national tradition were intimately connected with their more eastern co-religionists and compatriots. An Arabic treatise on gunpowder written in 1249 is up to this day preserved in the Library of the Royal Escorial.

In the National Library at Paris is preserved a work ascribed to one Marcus Graecus. It was published at Paris in 1806 as *Liber ignium ad comburendos hostes, auctore Marco Graeco*. About the nationality and the life of this Marcus Graecus nothing is known for certain. According to some he lived in the 9th, according to others in the 13th

⁸³ "Sed tamen salis petrae, lura nope cum ubre et sulphuris, et sic facies tonitruum et coruscationem, si scias artificium," in Roger Bacon's work "*De secretis operibus Artis et Naturae et de nullitate magiae*." At another place he alludes to fireworks: "Ex hoc ludicro puerili quod fit in multis mundi partibus scilicet ut instrumento facto ad quantitatem pollicis humani ex hoc violentia salis qui salpetrae vocatur tam horribilis sonus nascitur in ruptura tam modicae pergamene quod fortis tonitru rugitum et coruscationem maximam sui luminis jubar excedit."

century. The accuracy of the name is even doubtful, as he is also called Marcus Gracchus instead of Graecus. If the latter appellation be the more correct one, it might perhaps be surmised that the work was originally written in Greek. Saltpetre occurs three times in his book, as *sal petrosum*; *lapis qui dicitur petra salis*, and as *sal petrum*.⁸⁴ According to Marcus Graecus the composition of gunpowder is two parts of charcoal, one part of sulphur, and six parts of saltpetre.

Towards the end of the seventh century the architect Kallinikos of Heliopolis, when Constantinople was besieged by the Arabs in 668, manufactured big tubes made of iron or of other metals, formed like big beasts with gaping jaws, out of which were thrown iron, stones and combustibles. In consequence of the havoc caused by these projectiles the siege of the city was raised. The Greeks kept, it is said, the secret of the composition for four centuries, when it was betrayed to the Saracens, who availed themselves of it during the crusades at Jerusalem and also at Damietta. If the ingredients are rightly mentioned, *e.g.*, by the Byzantine princess, Anna Komnena, who wrote the history of her father Alexios, they consisted only of resin, oil, and sulphur, and not of saltpetre. As Kallinikos hailed from Heliopolis, the place otherwise known as Baalbec, and as the Greek fire seems to have been a liquid, the most important ingredient of which was naphtha, which was well known to, and was much made use of by the Eastern nations,—as it is found near Baku on the Caspian Sea, (where the gas, as it escapes from fissures in the earth in the neighbourhood of the oilsprings, has been burning unintermittedly for centuries and is worshipped by Parsees,) in the island of Tchelekin on the other side of the Caspian Sea opposite to Baku, in Mesopotamia, in Kurdistan, in North India, and in China—it is probable that Kallinikos only introduced this powerful com-

⁸⁴ See John Beckmann's History of Inventions and Discoveries under the article "*Saltpetre, Gunpowder, Aqua fortis*."

bustible into Western warfare, and that it was before his time employed in the East. At all events it was a most powerful preparation for the destruction of the enemy, and the terror it spread among the troops of Louis IX before Damietta is graphically described by contemporaries. It seems to have even been used in European wars, for, according to Père Daniel, the king Philip Augustus of France had brought home some of it from Acre, and used it at the siege of Dieppe against the English ships there at anchor.⁸⁵ It is said that Napoleon the Great became acquainted with the real composition of the Greek fire, but that he pronounced it inapplicable; one of the chief reasons for his decision being probably the fluid state of the combustible.

There exists an old tradition, according to which the Arabs possessed at an early date a knowledge of the manufacture of gunpowder, and that they obtained it originally from India, with which country they had an active commercial intercourse. They are even said to have improved on the original manufacture. That the Arabs received their earliest gunpowder supplies from India, and that this country was the original seat of its invention was very strongly urged so early as the end of the last century by M. Langlès in a paper read in the French Institute in 1798. This opinion is also upheld by Johann Beckmann (1739-1811), whose well known "History of Inventions and Discoveries" (*Beiträge zur Geschichte der Erfindungen*) has passed through many English editions. He says there: "In a word, I am more than ever inclined to accede to the opinion of those who believe that gunpowder was invented in India, and brought by the Saracens from Africa to the Europeans; who, however, improved the preparation of it, and found out different ways of employing it in war, as well as small arms and cannons."

⁸⁵ See *Projectile Weapons of War and Explosive Compounds*; by J. Scofield. N. S. third edition. London, 1858, pp. 50-60.

Having discussed so far the question as to the invention of gunpowder, we now turn to its application in war by means of projectile weapons. The first country in Europe where such projectile weapons were used was Spain. They are mentioned by Arabian writers as far back as 1312, and were used in 1323 at the siege of Baza. The French seem to have employed them since 1338 at first for dismantling castles and fortifications only, and not in the battle field as Edward III of England is said to have done in 1346 at Crecy. The French writers seem to have been indignant at the employment of such destructive arms against human beings, for one of them says: "On ne faisoit point encore usage en France en 1347 de cette arme terrible contre les hommes; les François s'en étoient bien servis en 1338, pour l'attaque de quelques châteaux, mais ils rougissoient de l'employer contre leurs semblables. Les Anglois, moins humains, sans doute, nous devancèrent et s'en servirent à la célèbre bataille de Creci, qui eut lieu entre les troupes du roi d'Angleterre, Edouard III, qui fut si méchant, si perfide, qui donna tant de fil à retordre à Philippe de Valois, et aux troupes de ce dernier; et ce fut en majeure partie à la frayeur et à la confusion qu'occasionnèrent les canons, dont les Anglois se servoient pour la première fois, qu'ils avoient postés sur une colline proche le village de Creci, que les François durent leur déroute."⁸⁶ These projectile weapons were formed like tubes and were therefore called *cannons* from *canna*, a reed. In German they were known as *Rohr*, which word has the same meaning. The small firearms were originally without a stock, and as they were very heavy, they used to be placed on a fork when they were discharged. The *arquebuse* with a wheel was first used by Emperor Charles V and Pope Leo X in the year 1521 at the siege of Parma against Francis I, King of France.

⁸⁶ See *Projectile Weapons of War*, p. 117.—In the Library of Christ Church, Oxford, is preserved in a beautifully illuminated Manuscript, which dates from 1336, and which has been in the possession of Edward III, the picture of an armour-clad warrior, who fires a bottle-shaped cannon.

The same Martin Bellay who states this fact, further informs us that the German horse or *Reiter* were the first, who were armed with pistols, and that those troopers were thence called pistoliers. *Musket* is a still later weapon. It has got its name from the French *mouchet* (Latin *muschetus*, sparrow hawk).⁸⁷ The Duke of Alva is reported to have first used them in the Netherlands.

The gun was originally fired by the simple application of a lighted match. The clumsiness and uncertainty of this procedure especially during storms and rains suggested improvements. At first a cock was added to give security to the hand, afterwards a firestone was inserted into this cock and a small wheel was fastened to the barrel. The wheel lock is said to have been invented in 1517 at Nürnberg in Bavaria. The firestone first used was not the flint which was employed later, but the pyrites or marcasite. The match was nevertheless not altogether discarded, as the stone often missed fire, and it was retained together with the wheel. Flint locks were of a far later origin. They were first used in 1687 by the Brunswickers, and they were introduced into England under William III during the years 1692-93. These continued improvements, to which we may add the modern percussion lock, the needle-gun, and the breech-loader, were mainly necessitated by the perilous and defenceless position a soldier was in as soon as he had discharged his gun against an enemy, who chose this moment as convenient to attack him. The greater the rapidity in loading, the greater is the efficiency of the fireweapon.

If we now turn our attention from the West to the East we find that powder and firearms seem to have been much earlier used in the latter than in the former.

It is recorded that in the battle near Delhi fought between Tamerlane and Sultan Mahmud, the latter opposed his

⁸⁷ According to others it was invented at the end of the fifteenth century by one Moketta of Velletri, after whom it is said to have been named.

enemy with 10,000 horsemen, 40,000 men on foot, and a great number of elephants clad in armour. On the top of those elephants were big howdahs from which the sharpshooters flung fireworks and rockets on the troops of Timur; and on the sides of those elephants marched "des jetteurs de pots à feu et de poix enflammée ainsi que des fusées volantes pointées de fer, qui donnent plusieurs coups de suite dans le lieu où ils tombent."⁸⁸ According to Clavigo, Timur was beaten in the first engagement through those 50 mailed elephants, but on the following day Timur took many camels and loaded them with dry grass placing them in front of the elephants. When the battle began, he caused the grass to be set on fire and when the elephants saw the burning straw upon the camels, they fled."⁸⁹ When attacking Bhatnir, Timur's troops were received in a similar manner for "the besieged cast down in showers arrows and stones and fireworks upon the heads of the assailants."⁹⁰

According to Ferishta, Hulaku Khan, the founder of the Mogol Empire in Western Asia, sent in 1258 an ambassador to the King of Delhi, and when the ambassador was approaching he was received by the vezir of the king with a great retinue, and among the splendid sights were 3,000 fire cars. About the same time we are informed that in the wars between the Chinese and the Mogol invaders a kind of fire-arms was used. It seems to have been like a rocket. It was called impetuous *fire dart*. "A nest of grains—case of chick peas—was introduced into a long tube of bamboo, which, on being ignited, darted forth a violent flame, and instantly the charge was projected with a noise like that of a *pao*, which

⁸⁸ See *Histoire de Timur-bec*, par Cherifeddin Ali d'Yezd, traduite par le feu M. Petits de la Croix. 1723, III, p. 94.

⁸⁹ See *Narrative of the Embassy of Ruy Gonzalez de Clavijo to the Court of Timur at Samarcand*. London, 1859, p. 153.

⁹⁰ See *Malfuzat-i-Timuri* in Sir H. M. Elliot's *Histories of India*, III, 424.

was heard at about the distance of 150 paces."⁹¹ Deguignes says that the Mogols used in 1275 a similar weapon against the Chinese: "Les Chinois reprirent Tchangtcheou; et Tchangchi-kiaï avec un grand nombre de barques qu'il avait ramassées, s'approcha pour combattre les Mogols. Mais At-chou avec des flèches enflammées, y fit mettre le feu, et les troupes Chinoises, après une vive résistance, se précipitèrent dans le fleuve."⁹² At another place Deguignes under the year 917 says that the Kitans⁹³ carried with them a combustible which they had received from the King of Ou, and that this fluid burnt even under water.⁹⁴ Arabian reports inform us that the Arabs used in India *Ātish-bāzī*, like those employed by the Greeks and Persians. Ferishta tells us that in the battle which Mahmud of Ghazna fought near Peshawar with Anandapāl in 1,008 cannon (*top*) and muskets (*tuṣṭang*) were used by Mahmud.⁹⁵ Colonel Tod says in his *Annals of Rajasthan*: "We have, in the poems of the Hindu poet Chand, frequent indistinct notices of fire-arms, especially the *nalgola*, or tube ball; but whether discharged by percussion or the expansive force of gunpowder is dubious. The poet

⁹¹ See On the early use of Gunpowder in India: in "The History of India" the posthumous papers of the late Sir H. M. Elliot, K.C.B., edited by Professor John Dawson, vol. VI., p. 460. Ibidem in note 2 is a quotation from Père Gaubil's "Histoire de Gentchiscan," p. 69. Les Mangous se servirent alors de *pao* (ou canons) à feu. On avait dans la ville des *pao* à feu. . . Je n'ai pas osé traduire par canon, les caractères *pao*, et *ho pao*, un de ces caractères a à côté le caractère *ché*, pierre, et c'était une machine à lancer des pierres. L'autre caractère est joint au caractère *ho*, feu, et je ne sais pas bien si c'était un canon comme les nôtres. De même, je n'oserais assurer que les boulets dont il est parlé se jetaient comme on fait aujourd'hui.

⁹² See "Histoire générale des Huns, par M. Deguignes, III, 162.

⁹³ On the Khitans see my book "Der Presbyter Johannes in Sage und Geschichte," pp. 121-126.

⁹⁴ See Deguignes, II, p. 61: "Ils (les Khitans) apportent avec eux une matière inflammable, dont le Roi de Ou leur avoit donné la connoissance, c'était une matière grasse qui s'enflammoit et qui brûloit au milieu des eaux."

⁹⁵ See The History of India, edited from Sir H. M. Elliot's papers by Prof. John Dawson, VI, 219 and 154.

also repeatedly speaks of "the volcano of the field," giving to understand great guns; but these may be interpolations, though I would not check a full investigation of so curious a subject by raising a doubt."⁹⁶ Muhammed Kāsim used such a machine or *manjanik* when besieging in A.H. 93 (A.D. 711-12) the port of Daibal. The first thing done with this machine was to shoot down from the top of the high pagoda a long pole surmounted with a red cloth.⁹⁷ The prophet Muhammed is also credited with having used the *manjanik* when besieging Taïf in the ninth year of the Hegira, and according to Ibn Kotaibah the projectile weapon in question was already used by Jazynah, the second King of Hyrah, whose date is fixed about the year 200 A.D.⁹⁸

Passing over the statements of Dio Cassius and Johannes Antiochenus, that the Roman Emperor Caligula had machines from which stones were thrown among thunder and lightning, we come to the statement of Flavius Philostratos, who lived at the court of the Emperors Septimius Severus, and Caracalla. In his history of Apollonios of Tyana, he mentions, that when that extraordinary man was travelling in India, he had among other things learnt the real reason why Alexander the Great desisted from attacking the Oxydracae. "These truly wise men dwell between the rivers Hyphasis and Ganges; their country Alexander never entered, deterred not by fear of the inhabitants, but, as I suppose, by religious motives, for had he passed the Hyphasis, he might, doubtless, have made himself master of all the country round them; but their cities he never could have taken, though he had led a thousand as brave as Achilles, or three thousand such as Ajax, to the assault; for they come not out to the field to fight those who attack them, but these holy men, beloved by the gods, overthrew their enemies with tempests and thunderbolts shot from their walls. It is said that the Egyptian

⁹⁶ See *Annals of Rajasthan*, I, 310.

⁹⁷ See Elliot's *Posthumous Papers*, VI, 462.

⁹⁸ *Ibidem*, p. 461.

Hercules and Bacchus, when they overran India, invaded this country also, and having prepared warlike engines, attempted to conquer them; they in the meanwhile made no show of resistance, appearing perfectly quiet and secure, but upon the enemy's near approach they were repulsed with storms of lightning and thunderbolts hurled upon them from above." In the apocryphal letter which Alexander is said to have written to Aristotle, he describes the frightful dangers to which his army were exposed in India, when the enemies hurled upon them flaming thunderbolts.⁹⁹

Firdusi ascribed to Alexander this expedient when opposed by Porus. While Sikander, according to the author of the Shah-Nama, was marching against Porus (Fur) his troops became so frightened when they perceived the numbers of elephants which Porus was sending against them that Alexander consulted his ministers how to counteract this foe. Their advice was to manufacture an iron man and an iron horse, place the former on the latter, fix the horse on wheels, fill them both with naphtha and propel them towards the elephants, where they would explode with great havoc.

Such a stratagem is ascribed by the Franciscan monk Johannes de Plano Carpini to Prester John when he was fighting against the Tatars. In my monograph on Prester John I have pointed out to what special event it may probably refer.¹⁰⁰

⁹⁹ See Philostratus *Tὰ εἰς τὸν Τυανέα Ἀπολλώνιον*. The words used by Philostratus are *θοοταὶ κάτω στρεφόμεναι* (II, 14), and *ἐμβρονηθέντας αὐτοὺς ὑπὸ τῶν σοφῶν* (III, 3).—Compare Projectile Weapons of War, pp. 83 and 84.

¹⁰⁰ See Der Presbyter Johannes in Sage und Geschichte, pp. 93 and 94. "Johannes Presbyter venit contra eos (Tataros) exercitu congregato, et faciens imagines hominum cupreas in sellis posuit supra equos, ponens ignem interius, et posuit homines cum follibus post imagines cupreas supra equos; et cum multis imaginibus et equis taliter praeparatis venerunt contra praedictos Tartaros ad pugnam; et cum ad locum praelii pervenissent, istos equos unum juxta alium praemiserrunt, viri autem qui erant retro, posuerunt nescio quid ignem qui erat in praedictis imaginibus et cum follibus fortiter sufflaverunt; unde factum est quod ex igne graeco homines comburentur et equi, et ex fumo aer est denigratus."

We read in the extracts remaining from the work of Ktesias¹⁰¹ on India, that an oil was prepared from a big worm, which lived in the deep bed of the river Indus. This animal had two big tusks (jaws? *branchiae*), slept during the day in the muddy sands of the banks of the rivers, which it left at night in search of food, seizing big animals, which it devoured. According to C. Plinius Secundus this worm catches even elephants.¹⁰² When such an animal has been caught—which is generally done by binding a sheep or a goat to a strong pole—it is kept suspended in the sun for thirty days, that the oil may drip from it, and this oil was collected in earthen pots. Each worm supplied a quantity equal to ten measures of oil. This was sent to the king in sealed jars. The oil had the power to ignite every thing and was for this reason used especially at sieges. Jars filled with this material were thrown into besieged towns and whatever they touched ignited as soon as they broke. Nothing but rubbish and sweepings could extinguish the flame, when once ignited. Neither man, nor animal, nor anything could

¹⁰¹ See Photii Myriobiblon, 1653, p. 153-156.

"Ὅτι ἐν τῇ ποταμῷ τῶν Ἰνδῶν σκώληξ γίνεται, τὸ μὲν εἶδος οἶόν περ ἐν ταῖς συκαῖς εἴωθε γίνεσθαι, τὸ δὲ μήκος, πήχεων ἐπὶ τοὺς μείζους δὲ καὶ ἐλάττους. τὸ δὲ πᾶχος δεκαετία παῖδα μόλις φασὶ ταῖς χερσὶ περιβαλεῖν. ἔχουσι δὲ ὀδόντας δύο, ἓνα ἄνω καὶ ἓνα κάτω καὶ ὅ,τι ἂν λάβωσι τοῖς ὀδοῦσι, κατεσθίουσι. καὶ τὴν μὲν ἡμέραν ἐν τῇ ἰλύϊ τοῦ ποταμοῦ διαιτῶνται, τῇ δὲ νυκτὶ ἐξέρχον. καὶ τούτων ὅς ἂν εὐτύχη τινὶ ἐν τῇ γῇ, βοτὴ ἢ καμήλη, καὶ δάκην συλλαβὼν ἔλκει εἰς τὸν ποταμὸν, καὶ πάντα κατεσθίει πλην τὰς κοιλίας. ἀγροῦε δὲ ἀγκίστρω μεγάλην, ἔριφον ἢ κροτῆρα ἐνδυσάντων τῇ ἀγκίστρῃ, καὶ ἀλύσεται σιδηραῖς ἐν αρμοσάντων. ἀγρούσαντες δὲ τριάκοντα ἡμέρας κρεμῶσιν αὐτὸν. καὶ ἀγγεῖα ὀκτωβόρεια. καὶ βέλῃ ἐξ αὐτοῦ, ὅσαν δέκα κοτύλους ἄττικας τὸ πλήθος. ὅσαν δὲ παρέλθωσιν αἱ τριάκοντα ἡμέραι, ἀπαβρίπτουσι τὸν σκώληκα. καὶ τὸ ἔλαιον ἀσφαλίσμενον, ἔχουσι τῇ βασιλεῖ μόνον τῶν Ἰνδῶν. ἄλλω δὲ οὐκ ἔξεστιν ἐξ αὐτοῦ ἔχειν. τοῦτο τὸ ἔλαιον, ἐφ' ὃ ἂν ἐπιχυθῇ, ἀνάπτει· καὶ καταφλέγει ξύλα καὶ ῥῶα. καὶ ἄλλως οὐ σβέννυται εἰ μὴ πολλὴ πολλὰ τε καὶ παχέη."

¹⁰² See Cui Plinii Secundi *Historia Naturalis*, Libr. IX, 17: "In eodem (Gange flumine) esse Statius Sebosus haud medico miraculo affert, vermes branchiis biuis, sex cubitorum, caeruleos, qui nomen a facie traxerunt. His tantas esse vires, ut elephantos ad potum venientes, mordicus comprehensa manu eorum abstrahant." Just previously Plinius had spoken of the *Delphinus Gangeticus* (platanista).

withstand this terrific combustible. Philostratos confirmed these statements. According to him this worm-like insect lives in the Hyphasis, and the flame caused by the fire can only be subdued by being entirely covered with dust. The king is the sole owner of all these animals. Ktesias, Aelianos, and Philostratos, all three agree in the name of this *worm*, which they call Skolex (σκώληξ). Lassen scorns the possibility of such a worm being in existence, and ascribes the whole description to the imaginative tendency so prevailing in the mind of Oriental nations. The late Professor H. H. Wilson takes a more practical view of the case, by identifying the worm in question with the Indian alligator, and remembering that the oil and the skin of the alligator were considered in ancient times to possess most wonderful qualities, and that the greater part of the other description tallies with the outward appearance and natural habits of the alligator. Wilson seems to have fixed on the right animal.¹⁰³ Nevertheless so far as the name σκώληξ is concerned nobody so far as I know has tried to explain it. An animal of seven cubits in length, and of a breadth in proportion to its size, could hardly have been called a *worm*, unless the original name of the beast in question resembled the Greek word *Skolex*. The word represented by the Greek word *Skolex* is no doubt the Sanskrit term *culukī*, *cullakī* (with the variations *ulupin* or *culumpin*). *Culukin* is derived from *culuka*, mire, it is therefore an animal which likes to lie or to live in mud. The *cullakī* is described in Sanskrit works as somewhat similar to the *Śiṣumāra*, which is identified with the Delphinus Gange-

¹⁰³ See Indische Alterthumskunde von Christian Lassen, II, pp. 641 and 642. "Unter diesen Erzeugnissen der überschwänglichen Einbildungskraft der Inder möge hier noch besonders gedacht werden, des aus im Indus lebenden Würmern gewonnenen Oeles, welches die Eigenschaft besessen haben soll, alles anzuzünden und zu der Ansicht verleitet hat, das die alten Inder Feuerwaffen gekannt hatten. Diese Nachricht muss im Gegentheil gebraucht werden, um zu beweisen, dass schon zur Zeit des Ktesias dichterische Vorstellungen, welche den Indern eigenthümlich sind, den Persern bekannt geworden waren." Compare also Elliot's History of India, VI, pp. 478-80.

ticus, though its name denotes a *childkiller*. The *cullakī* is therefore a large aquatic animal, which because it lives principally in water, is called a fish; and as the crocodile prefers as its place of abode the muddy banks of a river, the name *cullakī* applies most appropriately to it.¹⁰⁴

It is a peculiar coincidence that in Telugu an iguana is called *uḍumu*, and the lizard is generally called *uḍumupille* or young iguana; the Tamil name of the same animal is *uḍumbu*.

The identity is thus clearly established between the Greek word *skolex* (as the Greeks had no nearer sound than *sk* to resemble the palatal *c*), the Sanskrit words *culukī* (*cullakī*, *culumpī*, and *ulupī*), and the Dravidian *uḍumbu* and *uḍumu*.

On the west coast of India oil is even now obtained from big fish by letting their carcasses lie in the sun and allowing the oil thus to ooze out, which process creates all the while an unbearable stench. With respect to the quantity of oil gained out of a fish like a porpoise and of a crocodile, the superiority rests doubtless with the former, though a well-fed and plump gavial possesses no doubt likewise a considerable amount of oily substance.¹⁰⁵

The iguana resembles in its shape a crocodile, and both being named in the Dravidian languages and in Sanskrit by the word *culumpī* alias *uḍumbu*, this term applies in the former languages to the smaller and in Sanskrit to the larger animal. The Sanskrit word *musalī* and the Tamil *mudalai* are also identical in origin, but they differ in so far that *musalī*

¹⁰⁴ The author of the Śābdaratnāvalī explains it by *Śiṣumārākṛtimatsya*, i.e., a fish which resembles the porpoise; and in Hemacandra's *Anekārthasaṅgraha* we read *cullakī kuṇḍikā bhede śiṣumāre kulāntare*; Viśvaprakāśa and Medinikara have nearly the same explanation: *Culukī (cullakī) śiṣumārepi kuṇḍibhede kulāntare*, i.e., *culukī* is a pot; a porpoise (and) a kind of race.

¹⁰⁵ The oil of the crocodile is mentioned in Indian Medical Works, and it is in the list of Dr. Forbes Watson included among the commercial products of India.

denotes a house lizard and *mudalai* a crocodile. In fact the Sanskrit *musali* and *culumpin* (*culukī*) correspond according to their meaning to the Tamil *uḍumbu* and *mudalai*. The inference to be drawn from this fact is obvious.

The *culukin* is in Sanskrit only a large sized animal; a worm, especially an earth-worm, is called a *kiñculuka* or *kiñculaka* or *kiñcilaka*, i.e., a little *culuka*.

No doubt the description of Ktesias is in many respects inaccurate, but I hope to have been able to trace the thread of truth which runs through it.

As oil, especially boiling oil, is used in Indian warfare, the subject is of particular interest in this inquiry.

CHAPTER IV.

INDIA THE HOME OF GUNPOWDER AND FIREARMS.

IN every inquiry which is conducted with the object of proving that a certain invention has been made in any particular country it is of the utmost importance to show that so far as the necessary constituents of the object invented are concerned, all these could be found in the country credited with such invention.

The ordinary components of gunpowder are saltpetre, sulphur, and charcoal.

1. It is now generally admitted that the *nitrum* which occurs in the writings of the ancients was not saltpetre, but *natron*, i.e., sodium carbonate; the latter word is nowhere extant in Greek or Roman literature, though the words *nitrum* and *natron* are no doubt in their origin identical.

The word *netter* occurs twice in the Bible. It is described as an alkali, which was used as soap: "For though thou wash thee with nitre, and take thee much sope, yet thine iniquity is marked before me, saith the Lord God" (Jerem. ii. 22); and "As he that taketh away a garment in cold

weather, and as vinegar upon nitre, so is he that singeth songs to an heavy heart." (Proverbs. xv. 22.)

Herodotos mentions nitrum as litron (λίτρον) in his description of the embalming of dead bodies as practised in Egypt.¹⁰⁶ Pliny repeatedly speaks of nitrum, and Galen¹⁰⁷ records that it was burnt to strengthen its qualities. This would have had no effect if applied to saltpetre. There is no doubt that had the ancients known saltpetre, its oxydizing properties would soon have been discovered by them, which is the most important step towards the invention of gunpowder.

The word *natron* was introduced into Europe from the East by some European scholars who had been travelling there about the middle of the sixteenth century and who had thus become acquainted with this salt;¹⁰⁸ and though the word *natron* was originally used there for denoting saltpetre, its other form *nitrum* has been since assigned it; however, as we have seen, the nitrum of the ancients is quite different from our nitre, which is saltpetre (*potassium nitrate*).

Native saltpetre, i.e., saltpetre produced by entirely natural processes is very scarce, so much so that the inventor of *nickel*, Freiherr Axel Friedrich von Cronstedt (1722-65) was unacquainted with it. It is found especially in India, Egypt, and in some parts of America. Since the introduction of gunpowder in European warfare saltpetre has been manufactured wherever native saltpetre could not be obtained in sufficient quantities. It was obtained, from the efflorescence on walls (*sal murale*) and other sources, this exudation,

¹⁰⁶ Herodotos, II. 86, ταῦτα δὲ ποιήσαντες ταριχεύουσι λίτρον, and 87, τὰς δὲ σάρκας τὸ λίτρον καταθήκει.

¹⁰⁷ Nitrum ustum proprius ad aphronitrum accedit, utpote ex ustione tenuius redditum (λεπτομερέστερον). Ceterum nitro usto simul et non usto . . . in talibus morbis uti consuevimus (νίτρον δὲ κεκαυμένον τε καὶ ἀκαύστω καὶ ἡμεῖς ἐπὶ τοιούτων χρώμεθα. Galenus, *De Simplic. Med. Facult.* IX. Dioscurides says also that nitrum was commonly burnt. Compare Beckmann's History of Inventions, II. 433.

¹⁰⁸ See J. Beckmann, History of Discoveries, under the head Saltpetre, Gunpowder, Aquafortis.

together with all the other artificial modes of producing salt-petre, became a perquisite of the sovereign, and this *saltpetre regale* grew in time into as obnoxious a burden to the people as the hunting regale. The salt-petre regale is first mentioned, as having been exercised in 1419 by Günther, Archbishop of Magdeburg.¹⁰⁹

The little knowledge possessed by the ancients of chemical science, their utter ignorance of chemical analysis, accounts for their not improving, or rather for their not being able to improve the materials at their disposal and discovering the natural qualities of the different alkalis in their possession.

Throughout India salt-petre is found, and the Hindus are well acquainted with all its properties; it is even commonly prescribed as a medicine. India was famous for the exportation of salt-petre, and is still so. The Dutch, when in India, traded especially in this article.

In Bengal it is gathered in large masses wherever it effloresces on the soil, more particularly after the rainy season. In the Śukranīti salt-petre is called *suvarcalavaṇa*, well shining salt. The Dhanvantarinighaṇṭu describes salt-petre as a tonic, as a sonchal salt; it is also called *tilakam* (black), *kṛṣṇalavaṇam* and *kālalavaṇam*. It is light, shiny, very hot in digestion and acid. It is good for indigestion, acute stomach ache, and constipation. It is a common medical prescription.¹¹⁰

2. Sulphur, the second ingredient of gunpowder, is also found in India, especially in Scinde; it is, and was, largely

¹⁰⁹ See J. Beckmann, History of Discoveries, under the head Salt-petre, Gunpowder Aquafortis.

¹¹⁰ See Dhanvantarinighaṇṭu, in the Description of Salts.
Suvarcalavaṇaprokṭam rucyakam hr̥dyagandhakam
tilakam kṛṣṇalavaṇam tat kālalavaṇam smṛtam.
Laghū sauvarcalam pāke vīryoṣṇam viśadam kaṭu
gulmaśūlavibandhaghnam hr̥dyam surabhilocanam.
 Amarakoṣa, IX, 43. Sauvarcala'kṣarucake tilakam tatra mecake, and 110 sauvarcalam syāt rucakam.

imported into India from the East. It is well known and received its name from its smell, being called *gandha* or *gandhaka*, smell, or in this case as it has not a good smell, rather from its *stench*. Its quality differs with its color, according as it is white, red, yellow, or bluish. Though sulphur is a very important part of gunpowder, gunpowder is in some parts of India even prepared without it. Sulphur was always in great demand in India, and in medicine it is often made use of.¹¹¹

3. *Charcoal* is the third component part of gunpowder. Its constitution varies necessarily with the plants which in the different countries are used in its manufacture. In Prussia the coal of the alder, limetree, poplar, elder, willow, hemp, and hazel is used for powder. The charcoal of willow trees is especially esteemed on account of its excellent qualities. In the Śukranīti the *arka* (*Calotropis gigantea*), the *snuhi*, *snuhi* or *snuh* (*Euphorbia nerifolia*), and the *Rasona* (*Allium sativum*) are given as the plants whose charcoal is best fitted for gunpowder.

The *arka*, gigantic swallow wort, is a common bush growing in great quantities all over the country. It has a very good fibre, and is regarded by the natives as possessing most powerful and useful qualities. If the *arka* is used with discretion when iron is being forged, it contributes greatly to the excellence of the Indian steel. It is applied against epilepsy, paralysis, dropsy, &c. Its milky juice is smeared on wounds. It is a common sight in India to see suffering people applying it. The root is also used against syphilis. Its charcoal is very light and much used for pyrotechnical

¹¹¹ Śveto raktaśca pitaśca nīlaśceti caturvidhaḥ
 gandhako varṇato jñeyo bhinnabhinnagunaśrayaḥ; *Rājanighaṇṭu*.
 It is cleaned by being boiled with castor oil or goat's milk.

Gandhakam palamātram ca lohapatrāntare kṣipet
 eraṇḍatailam sampūrya pacet śuddhirbhaviṣyati.

Athava chagadugdghena pacitam śuddhim apnuyat.

See Sadvaidyajivana.

preparations, and its qualities in this respect are so well known that every school boy is acquainted with them and prepares his own powder and mixture with this plant. Its name in Tamil is *erukku*, in Malayalam *eruka*, in Telugu *jillēdu*, in Bengali *akund*, and in Hindustani *mudar* or *ark*.

b. The *snuhi*, *snuh*, (triangular spurge, *kalli* in Malayalam, *pāsān kalli* in Tamil, *bontajammudu* in Telugu, *narashy*, *seyard* in Hindustani and *narsy* in Bengali) grows like the *arka* in waste places all over the Indian Peninsula. The qualities of this plant for pyrotechnic displays are as well known as those of the *Calotropis gigantea*. Dried sticks of this plant are scarce. It is also widely used as a medicinal plant, externally against rheumatism, and internally as a purgative; it is given to children against worms.¹¹²

c. The *rasona* is a kind of garlic; the Marathi equivalent is *lasuna*. Its botanical name is *Allium sativum*.

The prescription for making gunpowder is, according to the *Sukraniti*, as follows: mix 5 parts of saltpetre with 1 part of sulphur and 1 part of charcoal. The charcoal is to be prepared from the *arka*, *snuhi*, and other similar plants in such a manner that during the process the plants are so covered that the smoke cannot escape. The charcoal thus obtained must be cleaned, reduced to powder, and the powder of the different charcoals is then to be mixed. After this has been done, the juice of the *arka*, *snuhi*, and *rasona* must be poured over the powder which is to be thoroughly mixed with this juice. This mixture is to be exposed and dried in the sun. It is then finally ground like sugar and the whole mixture thus obtained is gunpowder.¹¹³

¹¹² With respect to the *snuhi* there exists a Tamil proverb, reflecting on its leafless state and big growth. It runs as follows: "There is no leaf to contain a mustard seed; but there is shade to shelter an elephant." (கடுகுக்கு டட்ட இலைமில்லை; யானை தங்க இடமுண்டு).—Compare also: The Useful Plants of India, by Major Heber Drury, 1858, p. 100–102.

¹¹³ See Chapter V, §1. 141, 142.

The proportion of saltpetre varies, as some take 4 or 6 parts instead of 5, but the quantities of sulphur and charcoal remain unaltered.¹¹⁴ These two are the usual receipts. Nevertheless the mixture is often changed when the gunpowder is to be of a particular color or if it has to serve a special purpose. The three principal ingredients are mixed in different proportion, and realgar, opiment, graphite, vermilion, the powder of magnetic iron oxide, camphor, lac, indigo, and pine-gum are added to the compound according as they are required.¹¹⁵

It seems peculiar that powder should not have been mentioned in Sanskrit works, but this is not an isolated instance of the silence observed in them on matters of historical importance. It is most probable that the very common occurrence of gunpowder interfered with its being regarded as something extraordinary and worth mentioning. The actual mode of preparing the different sorts of gunpowder may on the other hand have been kept a secret in certain classes, and such a state of affairs coincides with the Indian system of caste. Explosive powder either used for rejoicings as fireworks or for discharging projectiles was known in India from the earliest period, and its preparation was never forgotten; but as India occupied in ancient times such an isolated position, it is not singular that the knowledge of this compound did not earlier extend to other countries. However wonderful the composition and however startling the detonating effect of powder may be to the uninitiated outsider, to those who have been familiar with them from their earliest youth all seems natural and intelligible. India is the land of fireworks; no festival is complete without them, and as the materials for their manufacture are all indigenous, and of easy access, there is no difficulty in gratifying such desires.

¹¹⁴ See Chapter V, §1. 143.

¹¹⁵ See Chapter V, §1. 146–148.

In an extract taken from the *Mujmalut Tawārīkh*—which was translated in 1126 from the Arabic, into which language it had been translated a century previously from a Sanskrit original—we read: “that the Brahmans counselled Hāl to have an elephant made of clay and to place it in the van of his army, and that when the army of the king of Kashmir drew nigh, the elephant exploded, and the flames destroyed a great portion of the invading force. Here we have not only the simple act of explosion, but something very much like a fuze, to enable the explosion to occur at a particular time.”¹¹⁶

Vaiṣampāyana mentions among the things to be used against enemies *smoke-balls*, which contained most likely gunpowder, and which were according to the explanation proposed by his commentator made of gunpowder.¹¹⁷

The following stanza, which is taken from the *Rājalakṣminārāyaṇahrdaya*, a part of the *Atharvaṇarahasya*, is no doubt a clear proof of the fact that the Hindus were familiar with gunpowder at a very remote period: “As the fire prepared by the combination of charcoal, sulphur, and other material depends upon the skill of its maker so also may thou, O ! representative of knowledge (Lakṣmī), by the application of my faith manifest thyself quickly according to my wish.”¹¹⁸

The Sanskrit word for gunpowder is *agnicūrṇa*, fire-powder, which is occasionally shortened into *cūrṇa*. The Dravidian languages have all one and the same word for medicine and gunpowder; in Tamil *marundu*, in Telugu *mandu*, in Kanarese *maḍḍu*, and in Malayālam *maruna*.

¹¹⁶ See the History of India of the late Sir H. M. Elliot, VI, 475; I, 107.
¹¹⁷ See note 60.

¹¹⁸ See *Rājalakṣminārāyaṇahrdaya* :
īṅgalagandhadipadārthayogāt
karturmanīśānuguno yathāgnih
caitanyarūpe mama bhaktiyogāt
kāṅkṣanurūpam bhaja rūpam āsu.

Occasionally the word gun (*tupāki*) is prefixed to remove any doubt as to what powder is meant. In Malayālam, the word *veḍi*, which means explosion, is prefixed. The Chinese crackers are called by the Tamulians *Sini veḍi*—Chinese crackers—to distinguish them from the Indian crackers. The word *marundu* is most probably derived from the Sanskrit past participle *mardita*, pounded, in the sense of different ingredients being pounded together, as a medicine powder. The meaning of gunpowder is then in a special sense derived from this general expression. The Dravidian equivalent of *cūrṇa* is *Suṇṇāmbu* in Tamil, *Sunnamu* in Telugu, chalk.

From the subject of gunpowder we now turn to the weapon, to which it is applied, i.e., to the firearms.

Two kinds of firearms are described in the *Śukraniti*, one is of small size and the other is of large size. The former is five spans long,¹¹⁹ has at the breech a perpendicular and horizontal hole, and sights at the breech and muzzle end of the tube. Powder is placed in the vent, near which is a stone, which ignites the powder by being struck. Many dispense with this flint. The breech is well wooded and a ramrod compresses the powder and ball before the discharge. This small musket is carried by foot-soldiers.

A big gun has no wood at its breech; moves on a wedge in order to be directed towards the object to be shot at, and it is drawn on cars.

The distance which the shot travels depends upon the strength of the material from which the gun is made, upon the circumference of the hole, and the gun's compactness and size. The ball is either of iron or lead or of any other material. Some big balls have smaller ones inside. The gun itself is generally of iron, occasionally also, as we

¹¹⁹ A span (*vitasti*) is the distance between the extended thumb and the little finger.

have seen in the Nitiprakāśikā, of stone. The gun is to be kept clean and must be always covered.¹²⁰

The term used for gun *nālika* (*nalika*, *nālīka*) is derived from the word *nāla* (*nala*), a reed, a hollow tube, which is another form for its synonyms *naḍa*, *nāḍi*, or *nāḍī*; in the same way *nālika* corresponds to *nāḍika*. Considering that the guns were in ancient times made out of bamboo, and that some bamboo guns are still used in Burmah, the name appears both appropriate and original. That the idea of bamboo being the original material for guns was still in the mind of the author of the Śukraniti seems to be indicated by his calling the outside of the stock of a gun *bark* (*tvak*).¹²¹

The gun is very seldom mentioned in Sanskrit writings, and even where it has been mentioned the meaning of those passages has been generally misunderstood. In all European Sanskrit dictionaries the word *nālika* or *nālīka* has been rendered as stalk, tube; arrow, dart, &c., but the third signification gun is not given; though it is one which is known to every learned Paṇḍit. At the outset every body can easily see that the meaning of arrow and of gun can be rightly applied to a reed; the arrow is a reed which is discharged as a missile, and a gun is a reed out of which missiles are shot.

In the ślokas 21 and 24 of our extract of the Śukraniti we read that a king should keep on a big war chariot two large guns, and in śl. 31 we are further informed that his beautiful iron chariot should be furnished with a couch, a swing, and among other things also with sundry arms and projectile weapons. This tallies with an account concerning the fortifications of Manipura, as described in Mr. J. Talboys Wheeler's "History of India." On the outside of the city were a number of wagons bound together with chains, and in them

¹²⁰ See Śukraniti, Chapter V, śl. 135-39 and 149-151.

¹²¹ See Śukraniti, Chapter V, śl. 139.

were placed fireworks and fire weapons, and men were always stationed there to keep guard." This statement is very important, and if substantiated would be of the greatest weight in this inquiry; but none of the Sanskrit Manuscripts of the Mahābhārata which I have searched contains this Śloka. However the above mentioned statement appears to rest on good authority, as the Śukraniti declares, that the wall of a fortress "is always guarded by sentinels, is provided with guns and other projectile weapons, and has many strong bastions with proper loop-holes and ditches."¹²²

In the second stavaka of the Bhāratacampū composed by Anantabhaṭṭa, some three hundred years ago, we find the following simile: "The fierce warrior who killed his enemy with heaps of leaden balls, which emerge quickly from the gun lighted by a wick, is like the rainy season which killed the summer with hailstones which descend quickly from the rows of black clouds lighted by lightning."¹²³

While the verse just quoted from the Bhāratacampū reveals an intimate knowledge of firearms, yet its apparent recentness may be alleged as an objection against its being produced as an authority for the existence of firearms in India at an early period. To obviate such further objections a śloka will now be given from an undoubted early poem, the Naiṣadha which describes the adventures of Nala and is generally ascribed to one Śrīharsa, a Brahman, who must not be confounded with Śrīharsa, the king of Kāśmīra. Its date goes back to the twelfth century, i.e., before the introduction of firearms into Europe. The verses in question run as follows: "The two bows of Rati and Manmatha are

¹²² See The History of India, Vol. I, pp. 405 & 422; and read Appendix.—
Compare also Śukraniti I, 238 and 255.

¹²³ Yamikai rakṣito nityam nalikastraiśca saṁyutah
Subahudrḍhagulmaśca sugavākṣapraṇalīkah.

¹²³ See Kālabudālinalīkat kṣaṇadīptivarttyam
sandhukṣitat sapadi sadhvaninissaradbhiḥ
varṣāsmasīsagulikānikaraiḥ kaṭhoraiḥ
gharmabhiyatim avadhit ghanakālayodhah.

certainly like her (Damayanti's) two brows, which are made for the conquest of the world, the two guns of those two (Rati and Manmatha) who wish to throw balls on you, are like her (Damayanti's) two elevated nostrils." ¹²⁴ To leave no doubt that guns are meant here, the learned commentator Mallinātha explains *nālika* as the *Dronicāpa*, the projectile weapon from which the *Dronicāpakāra*, a dart or a ball is discharged, an expression, we have already noticed in Vaiśampāyana's *Nītiprakāśikā*. ¹²⁵

On the other hand it is doubtful whether the *aśani* missile, which was given by Indra to Arjuna and which made when discharged a noise like a thunder-cloud, alludes to firearms, as *von Bohlen* explains it. ¹²⁶

In the first book of the *Śukranīti* we find it stated that the royal watchmen, who are on duty about the palace, carry firearms. The *Kāmandakiya*, acknowledged as one of the earliest works on *Nītiśāstra*, says that "Confidential agents keeping near the king should rouse him by stratagems, gunfiring and other means, when he is indulging in drinking bouts, among women, or in gambling." ¹²⁷ It seems from this statement that the practice of firing guns as signals

¹²⁴ See *Naiṣadha*, II, 28.

Dhanuṣi ratipañcabanayorudite viśvajayāya tadbhruvau
nalike na taduccanāsike tvayi nālikavimuktikāmayoh.

Mallinātha explains the second line as follows: "Damayantiya uccanāsike unnatānāsapuṣe tvayi nālikanām *dronicāpaśarāṇām* vimuktim kāmāyate iti tathoktayostayośailakām abhikṣācaribhyo na iti na pratyayaḥ. Nalike *dronicāpe* na kim iti kakūḥ pūrvavat utprekṣā.

¹²⁵ See p. 180.

¹²⁶ See *Das alte Indien*, mit besonderer Rücksicht auf Aegypten. Von Dr. P. von Bohlen, II, p. 66; compare *Mahābhārata*, *Vanaparva*, *Indralokābhigamanaparva*, I, 3, 4.

3. Evam sampūjito jīṇsuruvāsa bhavane pītuh
upaśikṣan mahāstrāṇi sa sainhārāṇi pāṇḍavaḥ.

4. Cakrasya hastāt dayitam vajram aśram ca dussaham
aśanīśca mahānādā meghavarhiṇīlakṣaṇaḥ.

¹²⁷ See *Kāmandakiya*, V, 51.

Panastridyutagoṣṭhiṣu rājanam abhitaścaraḥ
bodhayeyuḥ pramādyantam upāyairnalikādibhiḥ.

All the MSS. I have consulted give *nalika*, and so do also the prints in Telugu and Grantha characters. The Calcutta edition has *nālika* which as

was in vogue among the ancient Hindus, if we can trust the evidence of one of the oldest Sanskrit writings.

In the preface to a Code of Gentoo Laws, or Ordinances of the Pundits, occurs the following passage: "It will no doubt strike the reader with wonder to find a prohibition of firearms in records of such unfathomable antiquity; and he will probably from hence renew the suspicion which has long been deemed absurd, that Alexander the Great did absolutely meet with some weapons of that kind in India as a passage in Quintus Curtius seems to ascertain. Gunpowder has been known in China, as well as in Hindustan, far beyond all periods of investigation. The word firearms is literally Sanskrit Agnee-aster, a weapon of fire; they describe the first species of it to have been a kind of dart or arrow tipt with fire and discharged upon the enemy from a bamboo. Among several extraordinary properties of this weapon, one was, that after it had taken its flight, it divided into several separate darts or streams of flame, each of which took effect, and which, when once kindled, could not be extinguished; but this kind of agnee-aster is now lost. Cannon in the Sanskrit idiom is called *Shet-Agnee*, or the weapon that kills a hundred men at once, from (*Shete*) a hundred, and (*gheneh*) to kill; and the *Pooran Shasters*, or *Histories*, ascribe the invention of these destructive engines to *Beeshookerma*, the artist who is related to have forged all the weapons for the war which was maintained in the *Suttee Jogue* between *Dewtā* and *Ossoor*

I explained on page 232 as *d* and *l* are often interchanged, *dalayorabhedak*, is another form for *nālika*, if not so it must be regarded as an altogether false reading. The word *nālika* (given in Böthlingk and Roth's Sanskrit Wörterbuch as *nālika*) occurs nowhere else, and the only reference to it in the just now mentioned Sanskrit dictionary is this passage from the *Kāmandakiya*, and there even the meaning of the word is not positively stated, but it is merely suggested that it may be a gong (wohl eine metallene Platte, an der die Stunden angeschlagen werden).

278. When the king gladdens his soldiers on the march with a quarter extra pay, protects his body in the battle with a shield and armour;

279. has induced his soldiers to drink up to a state of intoxication, the strengthener of bravery, the soldier kills his enemy with a gun, swords, and other weapons.

280. A charioteer should be assailed by a lance, a person on a carriage or elephant by an arrow, an elephant by an elephant, a horse by a horse.

281. A carriage is to be opposed by a carriage, and a foot soldier also by a foot soldier, one person by another person, a weapon by a weapon, or a missile by a missile.

282. He should not kill a person who is alighted on the ground, nor one who is emasculated, nor one who has joined his hands as a suppliant, nor one who sits with dishevelled hair, nor one who says "I am thine."

Then follow beginning with 282 up to 284 the same exceptions as found in Manu, VII, 91—93, and specified in Halhed's Code.

The Śukranīti goes then on stating expressly:

286. These restrictions exist in fair but not in unfair fighting; to ensure the destruction of a powerful enemy there is no fighting equal to unfair fighting.

287. Unfair fighting was certainly observed by Rāma, Kṛṣṇa, Indra, and other gods; Bālī, Yavana, and Namuci were killed by unfair fighting.

We see thus that the Śukranīti is in direct opposition to the law code bearing Manu's name, and considering the estimation in which the latter was held, it can hardly be assumed that a member of the Brahmanic community—in which term I include all the three higher castes and the Śūdras within its pale—could have dared to compose it after the text of the Mānavadharmasāstra had once been finally settled as it stands to this day.

The Nitiprakāśikā coincides entirely with Manu, VII, 89, and in the first half of the 90th śloka, but differs in the second half of the 90th and the first half of the 91st śloka, and then agrees again, but this difference in two lines is of the greatest importance for our subject.¹³¹

Manu, VII.

89. Those rulers of the earth, who desirous of defeating each other, exert their utmost strength in battle without ever averting their faces, ascend after death directly to heaven.

90. No one should strike in a combat his enemy with concealed weapons, nor with barbed arrows, nor with poisoned arrows, nor with darts kindled by fire.

91. Nor should he kill a person who is alighted on the ground, nor one who is emasculated, nor one who has joined his hands as a suppliant, nor one who sits with dishevelled hair, nor one who says "I am thine."

Nītiprakāśikā, VII.

44. The same.

45. No one should strike in a combat his enemy with concealed weapons, nor with poisoned arrows, nor with machines kindled by fire (guns), nor also with various stratagems.

46. Nor should he kill a person who has climbed on a tree, nor one who is emasculated, nor one who has joined his hands as a suppliant, nor one who sits with dishevelled hair, nor one who says "I am thine."

¹³¹ See Manu, VII, 90, 91.

90. Na kuṭśairāyudhairhanyāt yudhyamāno rāṇe ripūn, na karṇibhir nāpi digdhair nāgniṇīvalitātajanaiḥ.

91. Na ca hanyāt sthālārūḍham na kṛtāñjalim, na mukta-keśam nāśnam na tavāsmīti vādinam.

Nītiprakāśikā, VII. 45, 46.

45. Na kuṭśairāyudhairhanyāt yudhyamāno rāṇe ripūn, digdhair-agnyujjvalairyantraistāntraiscaiva prthagvidhaiḥ.

46. Na hanyāt vṛkṣam ārūḍham na kṛtāñjalim, na mukta-keśam nāśnam na tavāsmīti vādinam.

The punishment of any one who contravenes these laws was that he should inherit all the sins of him whom he thus kills unlawfully, and his victim would become heir to all the virtues of his murderer.¹³² If what is most probable the Śukraniti and Nitiprakāśikā are of about the same age as our recension of the Mānavadharmasāstra, the question as to firearms being known at that period can only be answered in the affirmative.

It appears that before the codification of the law in law-books, the rules and precepts regulating certain subjects seem to have been generally known among the people and even assumed already the form of verse. Otherwise it can hardly be explained that the very same ślokas are found in different authors, unless one is prepared to state that one must have copied them from another. But for such a supposition there exists no proof. It is rather more likely that they were common property and then embodied in the respective codes. There is not the slightest doubt that the interdict of the Mānavadharmasāstra interfered a great deal with the popularity of firearms, and that though they continued to be used, they were less frequently or perhaps less openly employed. The Mahābhārata too contains many precepts by which mean, deceitful, and cruel behaviour is forbidden in war, but in reality those laws were often broken. The behaviour of the Kauravas against the Pāṇdavas, whom they tried to burn

¹³² As the Nitiprakāśikā differs somehow from the Mānavadharmasāstra and from the Śukraniti we give here the following verses.

- VII. 47. Na prasūptam na prāṇatam na nagnam na nirayudham
na yudhyamānam paśyantam na pareṇa samāgatam.
48. Ayudhavyasanam prāptam nartam nātiparikṣatam
na hinam na parāvṛttam na ca valmīkam āśritam.
49. Na mukhe tṛṇinam hanyāt na striyo veśadhāriṇam
etaḍṛṣaṇ bhāṭairvāpi ghatayan kilbiṣi bhavet.
50. Hanyamānasya yat kiñcit duṣkṛtam pūrvasañjītam
tat saṅgrhya svasukṛtam tebhyaḥ dadyāt tathāvidhaḥ.

With *na mukhe tṛṇinam hanyāt* (śl. 49) compare Mahābhārata, Rājadharmā, XCVIII, 48a : Tṛṇapāpamukhaścaiva tavāsmi ca yo vacet.

and to destroy by every imaginable means, the murder of the sleeping young Pāṇdavas perpetrated by the Brahman Aśvatthāma; these and many more similar acts prove that though the laws of humanity were acknowledged *in abstracto* they were not as in the present day followed *in concreto*.

Besides the interference of these moral rules with the extension of the use of such weapons, another and perhaps even more potent reason can be produced. Firearms were such powerful engines of war, that every one, who possessed them, kept their construction and handling as secret as possible. This is, in fact, the real reason, why so few books treat on this subject, and why such works are so jealously kept secret that it is most difficult to get hold of them.

The Mahābhārata and Rāmāyaṇa are full of the description of wonderful divine firearms, the Āgneyāstra. It may be that a solid substratum of fact underlies these descriptions, but they are so adorned with wonders that they outrun all reality. Perhaps the reason of these exaggerations was to conceal the real element of truth underlying them.

Aurva, the son of the sage Ūrva, or, according to the Mahābhārata, a son of Cyavana, was scarcely born when he threatened to burn the world by the flame proceeding from him. This flame was then removed into the sea, where it is known as the submarine fire (baḍavāgni).¹³³ Aurva became later the guardian of the orphaned Sagara, whom he instructed in the Vedas and to whom he gave the fire weapon (āgneyāstra), by means of which Sagara regained the kingdom which his father Bāhu had lost. Agniveśa, the son of Agni, received, according to the Mahābhārata, the Āgneyāstra from Bharadvāja, and Agniveśa handed this weapon down to the son of Bharadvāja, Droṇa. This wonderful fire weapon plays an important part in the epic and dramatic literature, but it should not be overlooked that similar

¹³³ See Harivamśa, XIV.

wonderful weapons were ascribed also to other gods besides, e.g., to Brahma, to Vāyu, to Varuna, &c., &c.¹³⁴

Considering that Śukra or Uśanas is a member of the Bhārgava family, it seems a striking coincidence that the āgneyāstra is through Aurva also connected with the same family.

It may look strange that while gunpowder and firearms appear to have been known in India since immemorial times, and though we know that fireworks and firearms were always in use—the Portuguese, the first Europeans who came to this country, were struck at their landing with the display of both¹³⁵—so few actual traces of them should be found in this country. But while admitting to a certain extent the truth of this observation, we must also consider that only very few old buildings have been preserved in India from ancient times, that we have nothing which can vie in age with Grecian antiquities, omitting Egyptian and Assyrian antiquities altogether. Yet still we can prove the existence of firearms by carved images of them being preserved in some ancient stone temples.

1. In the Madura District lies not far north from Rāmnād (*Rāmanāthapura*) on the sea the ancient *Tirupallāni*. It is

¹³⁴ See Harivaṃśa, XIV, 33.

Āgneyam astraṃ labdhvā ca Bhārgavat Sagarō nṛpaḥ
jigaya prthivīm hatva Talajaṅghan sahaihayān.

Compare Mahābhārata, Ādiparva, CXXX, 39, 40.

39. Agniveśam mahābhāgam Bharadvājaḥ pratāpāvan
pratyapadayat āgneyam astraṃ astravidam varāḥ.

40. Agnēstu jātassa munistato Bharatasattama
Bharadvājaṃ tad āgneyam māhāstraṃ pratyapadayat.

See Śakuntala, III, 56, and Uttara Rāma Caritra, VI.

¹³⁵ Castanheda says in his description of Vasco da Gama's entrance into Calicut: "The procession again set out, preceded by many trumpets and sacbuts sounding all the way; and one of the Nayres carried a caliver, which he fired off at intervals." See Elliot's History of India, VI, 467; compare Kerr's Collection of Voyages, Vol II, 364. According to Sir A. Phayre, the king of Pegu, when advancing in 1404 up the Irravadi against the king Meng Khounng could neither land at nor attack Prome, as it was defended with cannon and muskets; see Journal, Asiatic Soc. Bengal, 1869, XXXVIII, p. 40.

celebrated throughout India, on account of its famous temple dedicated to Ādijagannātha, for pilgrims visit it from Benāres and other places in the north. The erection of this shrine goes back to a far distant period. On the outside of an ancient stone maṇḍapa are seen the figures of some soldiers carrying in their hands small firearms. The dress of these sepoy is also peculiar, as the belts round their waists are provided with little bells. The soldiers have slippers on their feet and a peculiar cap on their heads.

2. In *Kumbhaghona* (Combaconum) is a temple devoted to Śārngapāni, i.e., to Viṣṇu bearing in his hands his bow Śārngā. It is one of the most ancient, largest, and most celebrated shrines in the Tanjore District. The height of the pagoda amounts to about 180 feet, and the numbers of its stories to eleven. On the left side of the front gate of the fifth story from the top is a king sitting in a chariot drawn by horses surrounded by his troops. In front of the king stand two sepoy with small firearms in their hands which look like pistols. The lower part of the pagoda is of solid stone, the higher ones and also the story just described partly of brick and partly of stone, i.e., the principal figures are all made of stone, but they are every ten years covered with a layer of chalk and bricks. The Śārngapāni pagoda is said to be about 500 years old. Its sanctity and beauty is praised by seven Ālvārs, so that as it has not been rebuilt since that time, it must have been in existence when the sages lived. Tirupati is glorified by nine and Śrīraṅgam by ten Ālvārs.

3. In *Kāñcīpuram* (Conjeveram) is a famous maṇḍapa, which, as it rests on a hundred columns, is called *Śatastambhamāṇḍapa*, or *Nūtikālmāṇḍapa* in Tamil. It was erected by Lakṣmikumārataṭācārya also called Kotikanyādānatāṭācārya, as he was very rich and generous, and was said to have given a wedding present of 50 rupees to a crore (or ten millions) of girls. Being a Tāṭācārya he belonged to one of the highest

74 priestly families of the Vaisnavabrahmans, as the Tātācāryas trace their descent to Nādhāmuni. He was the author of a work on Vedānta philosophy, and had at his own cost erected gopurams at Kāñcīpuram, Tirupati, Śrīraṅgam, and Tirumalīraṁśolai. His eldest son was Tirumalatātācārya, who administered the Anagunḍi kingdom for a while after the death of Vēṅkaṭapatiṛāya. When the Muhammedans occupied Kāñcīpuram Tirumalatātācārya lost all his riches.

The maṇḍapa is a square ; 12 columns face the eastern and western sides, 8 columns face the northern and southern ; besides these 96 columns 4 stand apart. On the 4th column of the north side, when coming from the west, is cut in solid stone, as the principal ornament of the column, a combat between soldiers. A trooper sits on horseback and a foot soldier aims with his firearm at his enemy. The maṇḍapa was erected about 1624 (the year being *tallaksmīdyeśakhābde*).

4. In the precincts of the Tanjore temple are carved in stone on stone pillars opposite the “ *Svarga ekadaśī*-gate sepoy with small carbines in their hands.

5. In *Pērūr*, a few miles from Coimbatore, is a celebrated Śiva temple and near it is a fine shrine, known as the Sabhāmaṇḍapa. On the base of its broad stone pillars stands a soldier with a gun in his hands. The date of the erection cannot be ascertained with exactness, and even popular belief does not ascribe to this maṇḍapa more than a few hundred years. As is usual with buildings in the south of the Dekkan Tirumala Nayak is occasionally named as its builder.

All these buildings, which, as we have seen, contain representations of firearms, are, according to our notions of antiquity, not very ancient, as, the Tirupallāni temple excepted, none of them is over 500 years old, but in judging the age of the subjects exhibited in the carvings of Indian temples, we should never lose sight of the fact that new subjects are not introduced in the architectural designs of the principal figures

in any Indian ecclesiastical building. No architect, no one who erects a sacred pagoda at his own cost, will dare to represent in the chief carving of a conspicuous part of a building, as a big stone column is no doubt, a subject which is new and with which his countrymen were not familiar in times of yore, or which are not mentioned in the Śilpasastra, or the works on arts. This is a custom which is well known to every learned Brahman, and which is observed even now. Occasionally one sees in temples and other buildings odd, nay, even very indecent groups ; but these quaint figures, which are by the bye never central ones, fulfil a special object, namely, to catch the evil eye, and so to protect the structure from any mischievous consequences. Whenever a new private house is built, such a figure will be displayed somewhere in a conspicuous place, and is generally removed after it had been in its place for some time and thus fulfilled its object. I have been assured on good authority that the Maricipātala, a very ancient work on architecture, contains a description of architectural designs relating to firearms, but though I have written for this work, I am afraid I shall get it too late to verify this statement.¹³⁶

Under these circumstances I cannot agree with the statement contained in Fergusson's excellent “ History of Indian and Eastern Architecture ” (p. 370), that “ the date of the porch at Peroor is ascertained within narrow limits by the figure of a sepoy loading a musket being carved on the base of one of its pillars, and his costume and the shape of his arm are exactly those we find in contemporary pictures of the wars of Aurungzebe, or the early Mahrattas, in the beginning of the 18th century.” I do not deny that the Sabhāmaṇḍapa may be comparatively new, but the figure of the sepoy with a musket in his hand can in no way settle the age of the building. As to the remarks concerning the costume of the soldier, there is

¹³⁶ See Lists of Sanskrit Manuscripts in Private Libraries of Southern India, No. 5,610, lately published by me.

nothing to prove that his dress belongs to any certain period, and considering that the Hindu, if conservative in any thing, is especially so in his food and his dress, there is much probability that the uniform of the sepoy has also not been altered much in subsequent times. Moreover it must not be overlooked that the dress, especially the head-dress or turban varies according to caste and locality.

This remark leads me to refute an assertion made with some authority by Mr. W. F. Sinclair in the *Indian Antiquary* of September 1878. It is in a critical notice on a few ślokas extracted, not quite correctly though, from the Śukraniti by Mr. Rām Dās Sen.¹³⁷ In verse 136 we read : "The breech at the vent carries stone and powder and has a machinery which produces fire when striking." Alluding to this śloka Mr. Sinclair says : "From the evidence above given, it seems to me that if they (those verses) are not such interpolations the whole work must be a forgery of, at best, the 17th century, a period which I am led to select by the mention of the flint." Does Mr. Sinclair want to insinuate by this, that the Hindus did not know flints, nor their peculiar properties ? It is hardly credible that a nation, which is so observant, should have overlooked objects of such common occurrence ; or, if it knew them, that it should not have applied them to some use. Is it not perhaps judging others too much according to our own proficiencies, to intimate that, if Europeans did not apply flints or flintlocks to guns before the 17th century, no body else could have done so ? There is scarcely anything so common, so well known in this country, as the qualities of the flint ; in fact the Hindus are adepts in any thing connected with the art of making fire.

In the sixth book of the Nitiprakāśikā are enumerated all the articles which a king should take with him when setting out for a military expedition. After mentioning all sorts of provisions and arms mention is also made in the 51st śloka

¹³⁷ *Indian Antiquary*, 1878, p. 136.

of the following things : "and also the cotton of the silk-cotton tree and iron joined with flint."¹³⁸ This suggests at once the ordinary Indian tinderbox commonly called Rāmasvāmī, from the figure of the idol on its top.

The word for "flint" is in Tamil *śakkimukki* or *śakimuki*, and in Telugu *cakimuki*. If these terms are not onomatopœtic, imitating the sound when the flint is struck, they may be regarded as derivations (*tadbhavam*) from the Sanskrit *śikhāmukha*, flame-mouth.

I trust thus to have proved that gunpowder and firearms were known in India in the most ancient times, that the statement in the Śukraniti about powder is supported by the Nītiprakāśikā of Vaiṣampāyana, and that the quotation from the Rājalakṣmīnārāyaṇahr̥daya, a part of the ancient Atharva-narahasya, is an additional proof of it. I contend further that the knowledge of making gunpowder was never forgotten in India ; but, that it was not earlier known in Europe is partly due to the isolated position of India, and partly also to the want of saltpetre in Europe, which prevented European nations from discovering the oxydizing properties of saltpetre. Moreover it must not be forgotten, that the preparation of gunpowder, even after it had become known, was kept everywhere a deep secret. The ancient Hindus enjoyed a well-deserved reputation as skilful artificers in iron and steel, the manipulation of which metals requires a considerable amount of ability, and these circumstances go surely far enough to justify the conclusion that the ancient Hindus were as well able to prepare firearms as the modern Hindus are now-a-days.¹³⁸ I further believe to have proved through quotations from the Nītiprakāśikā, the Naisadha, and even by incidental evidence from Manu that firearms were well known in ancient times, though the

¹³⁸ See Nītiprakāśikā, VI, 51 ; Śālmalitilikam caiva vāpyasmasarāśmasarh-yutām.—The Rūmpa hillmen, e.g., dig and smelt the iron-ore and cast it into musket-barrels.

interdict placed on them by Manu may have interfered somehow with their being generally used. On the other hand it must not be forgotten, that, though firearms existed, their construction was still in its infancy and that their application was very limited and did not diminish much the use of other arms. It ought also not to be overlooked that, as now, so also in ancient times, every thing connected with firearms and their improvement was surrounded with great mystery and the few books written on this subject were guarded like treasures and not communicated to the common crowd. The danger in handling firearms may also have deterred people from availing themselves of them so much as they otherwise would have done. Nevertheless the existence of guns and cannons in India in the earliest times seems to me to be satisfactorily proved from evidence supplied by some of the oldest Indian writings.

CHAPTER V.

ON THE ARMY ORGANISATION AND POLITICAL MAXIMS OF THE ANCIENT HINDUS.

THE SEVENTH SECTION OF THE FOURTH BOOK OF THE ŚUKRANITI.

1. Senā śāstrāstrasamyuktamanusyādigaṇātmikā.
2. Svagamānyagamā ceti dvidhā, saiva prthak tridhā, daivyāsuri mānavi ca, pūrvapūrvābalādhikā;
1. An army is a numerous body consisting especially of men Army provided with weapons and missiles.
2. It is of two kinds either self-moving or not self-moving; it is besides in a threefold manner an army either of gods, of demons or of human beings, each preceding being stronger than the succeeding.

3. Svagamā yā svayamgantri, yānagā'nyagamā smṛtā; pādātam svagamam, cānyadrathāsvagajagam tridhā. 5
4. Sainyāt vinā naiva rājyam, na dhanam, na parākramah.
5. Balino vaśagāḥ sarve durbalasya ca śatravaḥ bhavantyālpajanasyāpi, nṛpasya tu na kim punaḥ.
6. Śāriram hi balam, śauryabalam, sainyabalam tathā caturtham āstrikabalam, pañcamam dhībalam smṛtam, 10
7. Na balena vinātyālpam ripum jetum kṣamāḥ sadā devāsuranarāstvanypāyairnityam bhavanti hi.
8. Balam eva ripornityam parājayakaram param tasmāt balam abhedyam tu dhārayet yatnato nṛpaḥ. 15
9. Senābalam tu dvididham, sviyam maitram ca tad dvidhā, maulasādyaskabhedābhyām, sārāsāram punardvidhā.

3. It is called self-moving, if it moves itself; not self-moving if it moves on vehicles. Infantry is self-moving; the not self-moving army moves in three ways, on carriages, horses and elephants.
4. If there is no army, there is no government, no wealth, no power.
5. All become the subjects even of a man of humble birth if he is strong, all his enemies if he is weak; is this not more so in the case of a king?
6. There surely exists physical strength, bravery, likewise military strength, the fourth is the strength of weapons, the fifth is called intellectual power, the sixth is vital power; who is endowed with these is indeed another Viṣṇu.
7. By force alone are gods, demons and men ever able to conquer even a very weak enemy.
8. An army is truly always the best means for the defeat of an enemy, a king should therefore zealously maintain an unconquerable army.
9. An armed force is of two kinds, it is either one's own, or it belongs to an ally; each with its own classes of

10. *Asikṣitam śikṣitam ca, gulmibhūtam agulmakam, dattastrādi svaśastrāstram, svavāhi dattavāhanam.* 20
11. *Saujanyaṭ sādhakam maitram, sviyam bhrtyā prapālitaṃ, maulam bahvabdanubandhi, sādyaśkam yattadanyathā.*
12. *Suyuddhakāmukam saram, asāram viparītakam, śikṣitam vyūhakusalam, viparītam asikṣitam.*
13. *Gulmibhūtam sādhanikari, svasvāmikam agulmakam, dattastrādi svāmīnā yat, svaśastrāstram ato'nyathā.* 25
14. *Kṛtagulmam svayangulmam, tadvacca dattavāhanam aranyakam Kirātādi yat svādhīnam svatejasā.*
15. *Utsrṣtam ripunā vāpi bhrtyavarge niveṣitam bhedaḍhinam kṛtam śatrogḥ sainyaṃ śatrubalam smṛtam, ubhayam durbalam proktam, kevalam sādhakam na tat.* 30

reserve and line, and these again are in a twofold manner divided into efficient and inefficient men.

10. It is either trained or not trained, formed or not formed into corps, provided or providing itself with arms, provided or providing itself with vehicles.
11. An allied army is useful when kindly treated, one's own is maintained by pay; the reserve is of many years' standing, the line differs in this respect.
12. The efficient is eager for a good fight, the inefficient is the reverse; the trained is clever in tactics, the untrained is the reverse.
13. The army formed in corps has a commander, that which is its own master is not well arranged in corps; the one has received arms from the king, the other which carries its own arms differs in this respect.
14. The forster corps, *i.e.*, the Kirātas and similar tribes, which is subdued by the power of the king, is formed into corps or has formed itself into corps, after having been supplied with vehicles.
15. The army of the enemy which was given up by the foe, or which having entered his service is won over by dissension, is still regarded as hostile; both are regarded as weak, and especially as not trustworthy.

6. *Samairniyuddhakusalaivvyāyamairnatibhistathā vardhayet bahuyuddartham bhojyāḥ śarirakam balam.*
7. *Mrgayābhistu vyāghraṇām śastrāstrābhyasataḥ sadā vardhayet śūrasaṃyogāt saṃyak śauryabalam nrpaḥ.*
18. *Senābalam subhṛtyā tu tapobhyāsaistathāstrikam vardhayet śāstracaturasaṃyogāt dhībalam sadā.* 35
19. *Satkriyābhīścirasthāyi nityam rājyaṃ bhavet yathā, svagotṛe tu tathā kuryāt tat āyurbalam ucyate; yāvat gotṛe rājyaṃ asti tāvat eva sa jīvati.*
20. *Caturguṇam hi pādātam aśvato dhārayet sadā, pañcamānśānstu vṛṣabhān aśtāmśānśca kramelakān; 40*
21. *Caturthāmśān gajān ustrāt, gajārdīḥānśca rathānsthathā rathāt tu dviguṇam rājā bhṛhannālikam eva ca.*

16. One should increase the physical strength for pugilistic combats by diet and by athletic exercises and wrestling with equals and with those who are experts in close fighting.

17. A king should always well encourage bravery by tiger-hunts, by practice with weapons and arms and through association with brave men.

18. He should keep up his military strength by good pay, but the strength of his weapons by penance and practice; and his intellectual power by having always intercourse with wise persons.

19. That his kingdom may always be long lasting in his family, he should effect by good deeds, this is called vital power; as long as the kingdom remains in his family, he lives indeed.

20. A king should always maintain four times as many foot-soldiers as horses, for every five horses one bull, for every eight horses one camel; Proportion of different arms to each other.

21. For every four camels one elephant, for every two elephants one chariot, for every chariot two big guns.¹³⁰

¹³⁰ See pp. 170-172. The proportion of the different parts to each other is represented by 5 chariots, 10 elephants, 40 camels, 64 bulls, 320 horses, and 1,280 men.

22. Padatibahulam sainya madhyāśvam tu gajalpakam
tathā vṛṣoṣṭrasāmānyam rakṣet nāgādrikam na hi. 45
23. Savayassāraṇesaṇca śāstrāstram tu prthak śatam
laghunālikayuktānam padatinām śatatrayam ;
24. Aśityāśvān ratham caikam bṛhannāladvayam tathā,
ustrān daśa gajau dvau tu śakatau ṣoḍaśarsabhaṇ ;
25. Tathā lekhaṇaśatkaṁ hi mantritrityam eva ca,
dhārayet nṛpatih sunyak vatsare lakṣakarsabhāḥ. 60

22. He should keep an army with many foot-soldiers, with a moderate number of horses, but with few elephants; likewise with a small number of bulls and camels, but not with many elephants.
23. A prince, who gets a lac of karsas a year, should maintain well with weapons and missiles respectively one hundred men, 300 foot-soldiers with small firearms, who are (all) equal in age, strength and dress ;
24. eighty horses and one chariot; likewise two big guns; ten camels, two elephants, two waggons and sixteen bulls ;
25. likewise also six clerks and certainly three ministers.

¹⁶⁰ See Lilavati, §. 2-4.

2. Varāṭakanam daśakadvayam yat sa kakipī taśca paṇāscataśrah
te ṣoḍaśa dramma jhāvagamyo drammaistathā ṣoḍaśabhiśca niṣkaḥ.
3. Tulya yavābhyam kathitātra guṇja vallaistriguṇjo dharapam ca
te'ṣṭau
gadyāṇakastadvayam indratulyairvallaistathāiko dhātakaḥ pra-
diṣṭaḥ.
4. Dasārdhaguṇjam pravādanti māsam māśahvayaiṣṣoḍaśabhiśca karsaḥ
karsaīscaturbhiśca palam tula tacchatam suvarṇasya suvarṇasañ-
jham.

That is 20 Varāṭakas are 1 Kakipī, 4 Kakipīs 1 Paṇa, 16 Paṇas 1 Dramma, 16 Drammas 1 Niṣka. 2 Yavas are 1 Guṇja, 3 Guṇjas 1 Valla, 8 Vallas 1 Dharapam, 2 Dharapams 1 Gadyāṇaka and 14 Vallas 1 Dhātaka. Further 10½ Guṇjas are 1 Māsa, 16 Māsas 1 Karsa, 4 Karsas 1 Pala, 100 Palas 1 Tula and a Tula is equal to a Suvarṇa.

26. Sambhāradānabhogārtham dhanam sārddhasahasrakam,
lekhaṇārthe śatam māsi mantryarthe tu śatatrayam ;
27. Trisatam dāraputrārthe vidvadarthe śatadvayam
śadyaśvapadagārtham hi rāja catussahasrakam ; 55
28. Gajostavrṣanālārtham vyayikuryat catuṣṣatam
śeṣam kośe dhanam sthāpyam rājñā sārddhasahasrakam.
29. Pratīvaṛsam svavesārtham sainikebhyo dhanam haret.

26. The king should spend on provisions, largesse and pleasure Expend.
fifteen hundred karsas, on clerks one hundred a month, iture.
but on ministers three hundred ;
27. on his wife and son three hundred, on learned men two
hundred, on elephant-drivers, horses (cavalry) and
foot-soldiers four thousand ;
28. on the straw for elephants, camels and bulls four hundred.
The remaining money fifteen hundred karsas should
be deposited by the king in the treasury.¹⁶¹
29. The king should deduct every year a sum of money from
the soldiers for their dress.

¹⁶¹ The 100,000 Karsas will be expended as follows :—

	Per Mensem.
Provisions, largesse and pleasure	1,500 Karsas.
Clerks (one clerk at 16½ K.)	100 "
Ministers (one minister at 100 K.)	300 "
Wife and family	300 "
Learned men	200 "
Elephant drivers, cavalry and infantry	4,000 "
Straw	400 "
Reserve funds	1,500 "
Total	8,300 "

or 99,600 Karsas, i.e., about a lac of Karsas a year.

The title of a sovereign depends on the yearly income his country yields to him. A *Sāmānta* is called a prince who receives up to 3 lacs, a *Māṇḍalikā* gets up to 10 lacs, a *Rāja* up to 20 lacs, a *Mahārāja* up to 50 lacs, a *Svarāj* up to a crore or ten millions, a *Samrāj* up to 10 krores, and a *Pirāj* up to 25 krores. To a *Sarvabhāuma* is subjected the whole earth with its seven islands.

30. Lohasāramayaḥ cakrasugamo, mañcakāsaṇaḥ,
svāndolāyitarūdhastu, madhyamāsanāsārathih, 60
31. Śāstrāstrasandhāryudara, iṣṭacchāyo, manoramah,
evamīvidho ratho rājā rakṣyo nityam sadaśvakah.
32. Nilatālurnilajihvo vakradanto hyadantakah
dirghadveṣi krūramadah tathā prsthavidhūnakah.
33. Daśāṣṭonanakho mando bhūviśodhanapucchakah 65
evamīvidho' niṣṭagajo, viparitaḥ śubhāvahah.
34. Bhadro, mandro, mrgo, miśro gajo jātyā caturvidhah.

30. An iron-made carriage, well going on wheels, provided with a Carriage.
couch as a seat; on which is fixed a swing, with a
charioteer on the middle seat;
31. with an interior carrying weapons and missiles, giving agree-
able shade, and (altogether) beautiful—such a carriage
provided with good horses, should always be kept by
the king.
32. An elephant with a dark blue palate, a dark blue tongue, Elephant.
a crooked tooth, toothless, which bears malice a long
time, has fierce rut, waddles likewise with his hinder
part;
33. with ten or seven claws, is slow, which rubs the ground with
his tail—such an elephant is undesirable, the opposite
confers benefits.
34. The elephant is of four kinds according to its race; either
a Bhadra (*propitious*), Mandra (*pleasing*), Mrga (*deer*), or
a Miśra (mixed).

See Śukraniti, I, 184-187.

184. Samantaḥ sa nṛpaḥ prokto yavat lakṣatrayavadhi
tadūrdhvam daśalakṣanto nṛpo maṇḍalikah smṛtaḥ.
185. Tadūrdhvam tu bhavet rāja yavat viṃśatilakṣakah.
pañcāśat lakṣaparyanto mahārājah prakirtitaḥ
186. Tatastu koṭiparyantaḥ svarāt, samrāt tataḥ param
daśakoṭimito yavat, virāt tu tadanantaram
187. Pañcāśat koṭiparyantaḥ, sarvabhāumastataḥ param
saptadvīpa ca pṛthivī yasya vāśya bhavet sadā.

35. Madhvābhadantaḥ sabalaḥ samāngo vartulakṛtiḥ
sumukho' vayavaśreṣṭho jñeyo bhadra gajaḥ sadā.
36. Sthūlakukṣi śiṃhadrk ca brhattvāggalaśuṇḍakah 70
madyamāvayavo dhīrghakāyo mandragajasmṛtaḥ.
37. Tanukaṇṭhadantakarnaśuṇḍaḥ sthūlakṣa eva hi
suhrasvādharamedhrastu vāmano mrgaśāñjākah.
38. Eṣām lakṣmairvimilito gajo miśra iti smṛtaḥ;
bhinnam bhinnam pramāṇam tu trayāṇām api kirtitam. 75
39. Gajamāne hyaṅgulaṃ syāt aṣṭabhistu yavodaraḥ
caturviṃśatyāṅgulaistaiḥ karaḥ prokto maṇisibhiḥ;
40. Saptahastonnatirbhadre hyastahastapradirghatā
pariṇāho daśakaraḥ udarasya bhavet sadā.
35. The elephant which has honey-coloured teeth, is strong, well
proportioned, has a globular shape, good head and
excellent limbs, is always known as a Bhadra.
36. The elephant which has a huge belly, and a lion's eye, a
thick skin, throat and trunk, middle-sized limbs, a long
body, is styled Mandra.
37. The elephant which has a small neck, teeth, ears and
trunk, a peculiarly big eye, but a very small underlip
and membrum, and is dwarfish, is called Mrga.
38. The elephant which is mixed with the marks of these three,
is called Miśra. It is also mentioned, that these three
elephants differ respectively in size.
39. An āṅgula (the breadth of a thumb), when applied for the
measurement of an elephant, should consist exactly of
eight corns, 24 such āṅgulas are declared by wise men
to be an elephantine hand.
40. The height of a Bhadra is 7 cubits, its length 8 cubits, the
circumference of its belly should always be 10 cubits.

41. Pramāṇam mandramṛgayorhastahīnam kramāt atah
kathitam dairghyasāmyam tu munibhirbhadraman-
drayoh. 80
42. Brhadbhrūgaṇḍaphālastu dhṛtaśīrṣagatiḥ sadā
gajāḥ śreṣṭhastu sarveṣāṃ śubhalakṣaṇasāmyutaḥ. -
43. Pañcayavāṅgulaenaiva vājimānam prthak smṛtam,
catvāriṃśaṅgulamukho vāji yaścottamottamaḥ. 85
44. Ṣaṭtrimśadaṅgulamukho hyuttamaḥ parikīrtitaḥ
dvātrimśadaṅgulamukho madhyamaḥ sa udāhṛtaḥ.
45. Aṣṭāviṃśatyāṅgulo yo mukhe nicaḥ prakīrtitaḥ ;
vājinām mukhamanēna sārvaṇyavakalpanā. ,
46. Auccam tu mukhamānena triguṇam parikīrtitam. 90

41. The size of a Mandra and Mṛga is respectively one cubit less ; though the length of a Mandra and Mṛga is by sages declared to be the same.
42. The best of all elephants is surely that, which has large brows, cheek and forehead, bears always its head firmly, and is endowed with auspicious marks.
43. By an āṅgula of only five barley grains is the equine Horse. measure separately recorded. A horse whose head is 40 āṅgulas (long) is regarded as the very best.
44. A horse whose head is 36 āṅgulas long is surely considered a very fair one ; a horse whose head is 32 āṅgulas long is declared to be a middling one.
45. A horse whose head is 28 āṅgulas long is regarded as an inferior one. The proportion of all the limbs of a horse is measured by the length of the head.
46. The height is declared to be three times the length of the head.

47. Śiromaṇim samārabhya pucchamūlāntam eva hi
tritiyāṃśadhikam dairghyam mukhamānāt caturguṇam
pariṇāhastūdarasya triguṇastryaṅgulādhikāḥ.
48. Śmaśruhināmukhaḥ kāntapragalbhōttuṅganāsikāḥ
dirghodhdhatagrīvamukho hrasvakukṣikhuraśrutiḥ ; 95
49. Turapracāṇḍavegaśca hainsameghasāmasvanāḥ
nātikrūro nātimṛdurdevasatvo manoramāḥ ;
sukāntigandhavarnaśca sadguṇabhramarānvitāḥ.
50. Bhramarastu dvidhāvarto vāmadakṣiṇabhedataḥ
pūrṇo'pūrṇaḥ punardvedhā dirgho hrasvastathaiva ca. 100
51. Strīpundehe vāmadakṣau yathoktaphaladau kramāt
na tathā viparītau tu śubhāśubhaphalapradau.

47. The length beginning with the poll up to the very root of the tail is $1\frac{1}{3}$ of the height, or four times the length of the head, the circumference of the belly is three times the length of the head and three āṅgulas besides.
48. A horse which has a face without whiskers, is beautiful, courageous, has a high nose, a long and raised crest and head, a short belly, hoof and ear ;
49. is impetuous and fast, neighs like a cloud or a goose (*hamsa*), is neither too fierce nor too mild, is a pleasing *Devasatva* (godlike) ; it is of excellent beauty, flavour, and colour, and endowed with feathers of good qualities.
50. A feather is turned in two ways, either to the right or left, Feathers of the horse. is full or not full, and is further in a two-fold manner either long or short.
51. The left-and right-side feathers of mares and stallions are respectively, as said, auspicious, but not thus, if they are on opposite sides ; for they have then neither good nor bad consequences.

52. Nicordhvatiṛyaṇmukhataḥ phalabhedo bhavet tayoh
śaṅkhacakraḡadāpadmavedisvastikasannibhaḥ ;
53. Prāsādataṛaṇadhaṇuṣṣupūṛṇakalaśakṛtiḥ 105
svastikasraṇmīṇakhadḡaśṛivatsābhah śubho bhramaḥ.
54. Nāsikāgre lalāṭe ca śaṅkhe kaṇṭheca mastake
āvarto jāyate yeśāṃ te dhanyāsturagottamāḥ.
55. Hṛdi skandhe gale caiva kaṭideśe tathaiva ca
nābhau kuksau ca pārśvāgre madhyamāḥ samprakirtitaḥ. 110
56. Lalāṭe yasya cāvartadvitayasya samudbhavaḥ
mastake ca tṛtiyasya pūṛṇaharṣo'yam uttamāḥ.
57. Prsthavaṇṣe yadāvarto yasyaikāḥ samprajāyate
sakarotyāśvasaṇḡhātāṇ svāmiṇaḥ sūryasaṇḡjñikāḥ.
58. Trayo yasya lalāṭasthā āvartāstiryaguttarāḥ 115
trikūṭaḥ sa pariḡjñeyo vaji vṛddhikaraḥ sadā.

52. There will be a difference in efficiency according as its
mouth is low, high or oblique. If the feather is like a
shell, wheel, club, lotus, altar, portico ;
53. like an upper story, arch, bow, well-filled pitcher, like a
triangle, chaplet, fish, sword, a mole on the breast, it
is a lucky feather.
54. The horses on whose tip of the nose, forehead, temple,
throat or skull exists a feather, are the best.
55. Those horses are regarded as middling, which have it on
the heart, shoulder, neck, likewise on the hips, on the
navel, belly and foreribs.
56. That horse is the best *Pūṛṇaharṣa* (fulljoy) on whose temple
rises a double feather, and on whose skull rises a third.
57. That horse on whose backbone rises one feather, is called
Sūrya (sun) and procures to his master masses of
horses.
58. That horse on whose forehead stand three oblique feathers,
is called *Trikūṭa* (threepeaked) and it gives always pros-
perity to its master.

59. Evam eva prakāreṇa trayo grīvam samāsritaḥ ●
samāvartāḥ sa vājīśo jāyate nṛpamandire.
60. Kapolasthau yadāvartau drśyete yasya vājinaḥ 120
yaśovṛddhikarau proktau rājyavṛddhikarau matau.
61. Eko vātha kapolastho yasyāvartāḥ pradṛśyate
sarvanāmā sa vikhyātaḥ sa icchet svāmināśanam.
62. Gaṇḡdasamstho yadāvarto vājino dakṣiṇāsritaḥ
sa karoti mahāsaukhyam svāminam śivasaṇḡjñikāḥ. 125
63. Sahṛidvāmāsritaḥ krūrāḥ prakaroti dhanakṣayam
indrākṣau tāvubhau śastau nṛparājyavivṛddhidau.
64. Karṇamūle yadāvartau stanamadhye tathā parau
vijayakhyau ubhau tau tu yuddhākale yaśahpradau.
65. Skandhapārśve yadāvartau sa bhavet padmalakṣaṇaḥ
karoti vividhāṇ padmāṇ svāmiṇaḥ santatam sukham. 130

59. That is the best horse in the King's palace, on whose neck
are also placed three feathers in such a manner.
60. The two feathers which on a horse's cheeks are seen stand-
ing, are called augmentors of fame and are esteemed
as augmentors of kingship.
61. A horse, on whose left cheek is observed a feather standing,
is called *Sarvanāmā*, and it may wish for the destruc-
tion of its master.
62. The horse on whose right cheek stands a feather renders
his master very happy, it is called *Śiva* (prosperous).
63. That bad (feather) on the left side of the heart produces
loss of wealth, the two excellent *Indrākṣa* (Indra's eyes)
increase the kingdom of the king.
64. A horse which has two feathers on the root of the ear, or
which has also two on the middle of the breast ; these
both are called *Vijaya* (victory) and give glory in time
of war.
65. A horse, which has two feathers on the shoulderblade,
should be called *Padma* (wealth), it gives many virtues
and continual happiness to its master.

66. Nāsāmadhye yadāvarta eko vā yadi vā trayam cakravarti sa vijñeyo vāji bhūpālasaṅjñikah.
67. Kaṇṭhe yasya mahāvarta ekaḥ śreṣṭhaḥ prajāyate cintāmanih sa vijñeyah cintitārthasukhapradah.
68. Śuklākhyau phalakanthasthau āvartau vrddikirtidau. 135
69. Yasyāvartau vakragatau kuksyante vājino yadi, sa nūnam mṛtyum āpnoti kuryāt vā svāmināśanam.
70. Janusamsthā yadāvartah pravāsakleśakārakah, vājimedhṛe yadāvarto vijayaśrīvināśanah.
71. Trikasamstho yadāvartah trivargasya prajāśanah pucchamūle yadāvarto dhūmaketurānarthakṛt, guhyapucchatrikāvarti sa kṛtāntabhayapradah. 140

66. According as there is one feather or there are three feathers on the midst of the nose, the horse is called *Cakravartī* or *Bhūpāla*.
67. The horse on whose throat is one very good large feather, is called *Cintāmani*, bestowing every imaginary happiness and wealth.
68. Two feathers, which stand on the forehead and throat (and are) called *Śukla* (bright), give fame and prosperity.
69. If at the extremity of the belly of a horse are two curved feathers, that will surely incur death or cause the destruction of its master.
70. If there are feathers on the knees, they cause troubles and sojournings; if a feather is on the penis of a horse, it ruins victory and prosperity.
71. If a feather stands on the lower spine it is the destroyer of three things,¹⁴² if the feather *Dhūmaketu* (comet) is on the root of the tail, it produces trouble; a horse which has a feather on the anus, tail and lower spine causes fear of death.

¹⁴² Dharma, artha, kama.

72. Madhyadandā pārśvagamā saiva śatapadi kace atidustāṅguṣṭhamitā dirghādustā yathā yathā.
73. Ārupātahanugandahrdgalaprōthavastisu kaṭisāṅkhañjanumuskakakunnābhigudeṣu ca; dakṣakuksau dakṣapāde tvaśubho bhramarah sadā. 145
74. Galamadhye prsthāmadhye uttarosṭhe' dhare tathā, karnanetrāntare vāmakuksau caiva tu pārśvayōḥ ūruṣu ca śubhāvarto vājinām agrapādayoh. 150
75. Āvartau sāntarau phāle sūryacandrau śubhapradau militau tau madhyaphalau hyatilagnau tu dusphalau.
76. Āvartatritayam phāle śubham cordhvam tu sāntaram aśubham cātisamlagnam āvartadvitayam tathā.

72. If the feather is in the midst formed like a stick, is turned towards the sides, is on the head, it is a *Śatapadī*; it is very bad if it is a thumb broad, in proportion as it is long it is good.
73. If a feather is on the place where the tears fall, on the cheek, jaw, heart, neck and abdomen, on the buttock, temple, knee, penis, hump, navel and anus, if on the right belly, on the right foot, that is always an unlucky feather.
74. A good horse-feather is on the middle of the neck, on the middle of the back, on the upperlip, likewise on the underlip, between eye and ear, on the left belly, on the two sides, on the loins and on the frontlegs.
75. Two feathers apart on the forehead, *Sūryacandrau* (sun and moon) give luck, if not apart they are pretty good, but surely unlucky, if much mixed.
76. Three perpendicular and apart standing feathers on the forehead are lucky, but two (similar) much mixed feathers are unlucky.

77. Trikonatritayam phāle āvartānām tu duḥkhadam
gālamadhye śubhaḥ tvekaḥ sarvāsubhanivāraṇaḥ. 155
78. Adhomukhaḥ śubhaḥ pāde phāle cordhivamukho bhra-
mah
nacaivātyaśubhā prsthāmukhi śatapadī matā. 160
79. Medhrasya paścāt bhramarī stanī vāji sa cāśubhaḥ,
bhramah karnasamipe tu śrīṅgi caikaḥ sa ninditaḥ.
80. Grivordhvpārśve bhramarī hyekaraśmiḥ sa caikataḥ
pārdordhvamukhabhramarī kilōtpāṭī sa ninditaḥ.
81. Śubhaśubhau bhramau yasmin sa vāji madhyamah
smṛtaḥ
mukhe patsu sitaḥ pañcakalyāṇośvaḥ sadā mataḥ.

77. Three triangular feathers on the forehead are unlucky;
but one lucky feather on the middle of the neck, sus-
pends all bad ones.
78. A feather on the foot with its face downwards, and one on
the forehead with its face upwards, is lucky, but the
Śatapadī is not regarded as very lucky, if it is turned
towards the back.
79. If the feather is a *Stanī* (having a nipple) behind the
penis, the horse is also unlucky, but if the feather is
a *Śrīṅgi* (horned) near the ear, it is blamed.
80. The feather *Ekarāśmi* (having one string) on one side on the
upper part of the neck, (and) the feather *Kilōtpāṭī*
(destroying bolts) on the foot with its face upwards is
despised.
81. The horse in which are lucky and unlucky feathers is
a *Madhyama* (middling), that which is white on the head
and feet is always esteemed as a *Pañcakalyāṇa* (excellent
for five things).

82. Sa eva hṛdaye skandhe pucche śveto'stamaṅgalaḥ,
karṇe śyāmaḥ śyāmakarṇaḥ sarvataḥ tvekavarṇabhāk. 165
83. Tatrāpi sarvataḥ śveto medhyaḥ pūjyaḥ sadaiva hi,
vaidūryasannibhe netre yasya sto jayamaṅgalaḥ.
84. Mīśravarṇaḥ tvekavarṇaḥ pūjyaḥ syāt sundaro yadi. 170
85. Kṛṣṇapādo hayo nindyaḥ tathā śvetaikapādapi
rūkṣo dhūsaravarṇaśca gardhabhābho'pi ninditaḥ.
86. Kṛṣṇatāluḥ kṛṣṇajihvaḥ kṛṣṇoṣṭhaśca vininditaḥ
sarvataḥ kṛṣṇavarṇo yaḥ pucche śvetaḥ sa ninditaḥ.
87. Suśvetaphālatilako viddho varṇāntareṇa ca
sa vāji dalabhañji tu yasya so'pyaṭininditaḥ. 175

82. The horse which is white on the heart, shoulder and tail is
an *Aṣṭamaṅgala* (excellent for eight things), that, which
has a black ear and only one other color (besides) is a
Śyāmakarṇa (black ear).
83. That which except there (the black ear) is totally white, is
always to be worshipped as a *Medhya* (sacrificial), that
whose eyes are like a turquoise is a *Jayamaṅgala* (excel-
lent for victory).
84. Whether a horse has different colours or has one colour
it should always be esteemed, if it is beautiful.
85. A horse with a black foot is despicable, likewise if it has
only one white foot, one which is rough and is grey-
coloured is always blamed as looking like a donkey.
86. A horse with a black palate, black tongue and black lip is
despised; a horse which is everywhere black but is
white at the tail is blamed.
87. That horse which has on its forehead a very white mark,
which is perforated by another colour is a *Dalabhañji*
(Piece breaking) and its owner is also much blamed.

88. Samhanyāt varṇajān doṣān snigdhaveṛṇo bhavet yadi ;
balādhikaśca sugatirmahān sarvāṅgasundarah,
nātikrūrah sadā pūjyo bhramādyairapi dūṣitaḥ.
89. Parīṇāho vṛṣamukhāt udare tu caturguṇaḥ
sa kakut triguṇoccam tu sārđhatriguṇadīrghatā. 180
90. Saptatālo vṛṣaḥ pūjyo guṇairetairyuto yadi
na sthāyī na ca vai mandah suvōdhā hyaṅgasundarah,
nātikrūrah supṛsthaḥ ca vṛṣabhaḥ śreṣṭha ucyate.
91. Trīṇsadyojanagantā vā pratyaham bhāravāhakah
daśatālaśca¹⁴³ sudṛđhaḥ sumukhoṣṭrah praśasyate. 185
92. Śatam āyurmanuṣyāṇām gajānām paramam smṛtam
manuṣyagajayorbālyam yāvat vīṇsativatsaram.

88. If however the colour is agreeable it suspends all faults arising from colour ; and a horse which is very strong, goes well, is large, beautiful in all its limbs, not very fierce is always to be honoured, even if spoiled by feathers.
89. The circumference of the belly is four times the size of a Bull. bull's head, three times its size is the height and three and a half times its length.
90. A bull which is seven spans high, if provided with good qualities, is to be respected. A bull which does neither stop, nor is slow, carries well, is moreover beautiful in limbs, is not very fierce, has a good back ; is called the best bull.
91. A camel, which goes daily thirty yojanas while carrying Camel. loads, is ten spans high, very strong and has a fine head, is praised.
92. A hundred years is recorded as the longest life of men and elephants, the youth of men and elephants is reckoned up to twenty years.

¹⁴³ "navatālaśca" is a different reading in one MS.

93. Nṛṇām hi madhyamam yāvat ṣaṣṭivarsam vayassmṛ-
tam
aṣṭivatsaram yāvat gajasya madhyamam vayah. 190
94. Catustrīṇsat tu varṣāṇām aśvayāyuh param smṛtam
pañcaviṇṣati varṣam hi param āyurvṛṣoṣṭrayoh.
95. Bālyam aśvavṛṣoṣṭrāṇām pañcasamvatsaram matam
madhyamam yāvat ṣoḍaśābdam vārdhakyam tu tataḥ
param.
96. Dantānām udgamairvarṇairāyurjñeyam vṛṣāśvayoh
aśvasya ṣaṭ sitā dantāḥ prathamābde bhavanti hi. 195
97. Kṛṣṇalohitavarṇāstu dvitīye'bde hyadhogataḥ,
tṛtīye'bde tu sandamśau madhyamau patitodgatau.
98. Tatpārśvavartināu tau tu caturthe punarudgatau,
antyaū dvau pañcamābde tu sandamśau punarudgatau.

93. The middle age of men is estimated to last up to sixty years, the middle age of an elephant up to eighty years.
94. On the other hand thirty-four years are considered as the utmost age of horses, while twenty-five years are surely the highest age of bulls and camels. ^{Age of horses.}
95. The youth of horses, bulls and camels extends up to five years, the middle age up to sixteen years, but afterwards is old age. ^{Age of bulls and camels.}
96. By the growth and colour of the teeth the age of bulls and horses can be known. Six white teeth are surely in the first year of a horse, ^{Teeth of horses.}
97. but in the second year the lower teeth become dark red coloured, in the third year the middle biters fall out and come again ;
98. in the fourth year those two on their sides fall out and come again, in the fifth year the two biters at the end fall out and come again ;

99. Madhyapārśvāntagau dvau dvau kramāt kṛṣṇau ṣaḍ-
abdataḥ ; 200
navamābdāt kramāt pītau tau sitau dvādaśābdataḥ.
100. Daśapañcābdataḥ tau tu kācābhau kramataḥ smṛtau
aṣṭādaśābdataḥ tau hi madhvābhau bhavataḥ kramāt.
101. Śaṅkhābhau caikaviṃśābdāt caturviṃśābdataḥ sadā
chidram sañcalanam pāto dantānam ca trike trike. 205
102. Prothe suvalayastisrah pūrṇayuryasya vājinaḥ,
yathā yathā tu hinastā hinam āyustathā tathā.
103. Janūtpāto tvosthavadyo dhūtaprsthō jalāsanah
gatimadhyāsanah prsthapāti pascādgamordhvapat.
104. Sarpajihvo rūksakāntirbhīruraśvo'tininditaḥ, 210
sacchidraphālatilako nindya āśrayakṛt tathā.

99. from the sixth year the two middle, side and end teeth
become gradually black, each pair becomes in its turn
yellow from the ninth year ; and white from the
twelfth year.
100. From the fifteenth year each pair is said to become in
its turn glass-coloured, from the eighteenth each pair
becomes by degrees honey-coloured ;
101. from the twenty-first year each pair becomes shell-coloured,
from the twenty-fourth each pair becomes in each third
year hollow (24th-26th year), shaky (27th-29th), and
falls out (30th-32nd).
102. The horse which has three deep wrinkles in the nostrils has
a long life ; in proportion as the wrinkles are deficient
the life is also limited.
103. A horse which jumps up on its knees, makes a noise with its
lips ; sits down in water, stands still in the midst of the
road, falls on its back, jumps upwards while going
backwards,
104. which has a tongue like a serpent, is of disagreeable colour,
and timid is much despised ; despised is also a horse
whose mark on the forehead has flaws and which stands
often still.

105. Vṛsasyāṣṭau sitā dantāḥ caturthe'bde'khilāḥ smṛtāḥ,
dvāvanyau patitotpannau pañcāme'bde hi tasya vai.
106. Śaṣṭhe tūpāntyau bhavataḥ sapṭame tatsamīpagau,
aṣṭame patitotpannau madhyamau daśanau khalu. 215
107. Kṛṣṇapitasitaraktasāṅkhacchāyau dvike dvike
kramāt hi dve ca bhavataḥ calanam patanam tataḥ.
108. Uṣṭrasyoktaprakāreṇa vayoñānam tu vā bhavet.
109. Prerakākarsakamukho'ṅkuśo gajavinigrahe 220
hastipakaigajastena vineyassugamāya hi.
110. Khalinasyordhvakhaṇḍau dvau pārśvagau dvādaśāṅgu-
lau
tatpārśvāntargatabhyām tu sudṛḍhabhyām tathaiva ca.

105. Eight complete white teeth are mentioned as existing in Teeth of a
the fourth year of the bull, in its fifth year two molars bull.
fall out and rise again ;
106. in the sixth year the two next to the molars, in the seventh
the two next ones, in the eighth year the two middle
biters fall and come again.
107. Every second year they get by degrees black, yellow, white,
red and shell-coloured. Each pair becomes gradually
loose and falls out.¹⁴⁴
108. The knowledge of the age of a camel may be likewise Age of a
reckoned according to the above-mentioned rule. camel.
109. For training an elephant a hook is used by the elephant- Elephant-
drivers, which has one point for driving on and another training.
for drawing back ; by this hook the elephant is guided
to go well.
110. The two upwards and sideways pointing parts of a bridle- Bridle.
bit are respectively on the whole twelve aṅgulas long,
with two inside but very strong pieces,

¹⁴⁴ Black in the 9th and 10th year, yellow in the 11th and 12th, white in the
13th and 14th, red in the 15th and 16th, shell-coloured in the 17th and 18th,
in the 19th the end teeth get loose, in the 20th the end teeth fall out and
the last but one become loose, &c. &c.

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111. Vārakārsakhaṇḍābhyām rajvarthavalayair yutau
evamvidhakhalinena vaśikuryāt tu vājinam.
112. Nāsikākarsarajvā tu vṛṣoṣṭram vinayet bhr̥ṣam 225
tikṣṇāgro yaḥ saptaphālah syāt eṣām malaśodhane.
113. Sutaḍanairvineyā hi manusyaḥ paśavaḥ sadā,
sainikāstu viśeṣeṇa na te vai dhanadandataḥ.
114. Anūpe tu vṛṣāśvānām gajoṣṭrāṇām tu jāṅgale 230
sādhārane padatinām nivesāt rakṣaṇam bhavet.
115. Śātam śātam yojanānte sainyam rāstre niyojayet.
116. Gajoṣṭravṛṣabhāśvāḥ prāk śreṣṭhāḥ sambhāravāhane ;
sarvebhyāḥ śakataḥ śreṣṭhā varṣakālam vinā smṛtāḥ.
117. Na cālpasādhano gacchet api jetum ripum laghum 235
mahatātyantasādyaskabalenaiḥ subuddhiyuk.

111. and are joined with rings for reins both for stopping and
pulling back ; with such a bridlebit one may manage
a horse.
112. One may guide firmly a bull with a rein pulling through Bullrein.
its nose, in cleaning them of dirt should be (used) an
instrument with seven sharp-pointed combs.
113. Men and beasts should certainly always be managed by
severe beating ; but soldiers specially ; they should not
be subjected to fines.
114. By keeping horses and bulls in a marshy country, elephants
in a jungle (and) foot-soldiers in a plain, their safety
will be ensured.
115. At the end of each yojana,¹⁴⁵ a king should keep in his Distri-
inhabited kingdom a troop of one hundred soldiers. bution
of troops.
116. Elephants, camels, bulls and horses are in the order of prece-
dence excellent for carrying provisions, better than all
these are stated to be cars, except in the rainy season.
117. A wise general should not march even against a weak enemy Precepts
insufficiently prepared, but only with a very numerous on fighting
army consisting of troops of the line. and
ruling.

¹⁴⁵ A yojana is a measure of different length, its shortest extent amounts
to 2½ and its longest to about 18 English miles ; it is generally fixed at 4
kroṣas or 9 English miles.

118. Asiksitam asāram ca sādyaśkam tūlavacca tat,
yuddham vinā'nyakāryeṣu yojayet matimān sadā.
119. Vikartum yatate'lpo'pi prāpte prāṇātyaye'niśam
na punaḥ kimtu balavān vikāraḥ karānakṣamaḥ.
120. Apibahubalo'śūro na sthātum kṣamate raṇe 240
kim alpasādhano'śūraḥ sthātum śakto'riṇā samam ?
121. Susiddhālpabalaśśūro vijetum kṣamate ripum,
mahāsusiddhabalayuk śūraḥ kim na vijesyati.
2. Maulasikṣitasāreṇa gacchet rājā raṇe ripum
prāṇātyaye'pi maulam na svāminam tyaktum icchati. 245
3. Vagdaṇḍaparuseṇaiva bhr̥tihrāseṇa bhititah
nityam pravāśayāsābhyām bhedo'vaśyam prajāyate.

18. An undisciplined and inefficient line is (weak) like cotton ;
a wise man should always apply it to all other purposes
but fighting.
119. A weak person, if he is in danger of his life, tries always
to fight, how much more a strong one, who is able
to attack ?
120. A coward though he has a very strong army cannot stand
in the battle-field, how can a coward with small support
stand in a battle ?
121. A hero who has a small but well-disciplined army is able
to conquer the enemy ; (if so) will not a hero with a
strong well-provided army conquer ?
122. A king should go to battle against an enemy with an
efficient and disciplined reserve, the reserve does not wish
to leave his master even when in danger of death.
123. Discontent arises necessarily from severe reprimands and
severe punishments, from fear, from reductions of pay,
from always sojourning abroad and from fatigues.

124. Balam yasya tu sambhinnam manāk api jayaḥ kutaḥ
śatroḥ svasyāpi senāyā ato bhedaṁ vicintayet. 250
125. Yathā hi śatrusenāyā bhedo'vaśyam bhavet tathā,
kaūṭilyena pradānena drāk kuryāt nrpatiḥ sadā.
126. Sevayātyantaprabalam natyā cārim prasādhayet
prabalam mānadānābhyām yuddhairhinabalam tathā.
127. Maitryā jayet samabalam bhedaḥ sarvān vaśam nayet,
śatrusamsāadhanopāyo nānyaḥ subalabhedataḥ. 255
128. Tāvat paro-nitimān syāt yāvat subalavān svayam
mitram tāvat ca bhavati puṣṭāgneḥ pavano yathā.
129. Tyaktam ripubalam dhāryam na samūhasamipataḥ
- prthak niyojayet prak vā yuddhārtham kalpayet ca tat.

124. How can be victory to him, whose army is even a little
discontented? he should therefore always investigate
the discontent which exists in his army and in that of his
enemy.
125. That discontent should necessarily prevail among the hostile
army, a king should always speedily endeavour by
deceitful means and bribes.
126. One should propitiate an overpowerful enemy by submis- Behaviour
sion, a powerful one by demonstration of respect and towards an
by presents, and a weak one (one should subdue) by enemy.
fighting.
127. He should win over an equal in strength by friendship;
by divisions he should subdue all. There is no other
means of subduing an enemy than by (spreading)
discontent among his strong army.
128. As long as an enemy is powerful he is able to govern, and
so long he is a friend; as the wind is (a friend) of the
strong fire.
129. The hostile army which has deserted to the king must be
protected, but not kept near his own army; he should
place it separately or arrange it in front for fighting.

130. Maitryam ārāt prsthabhāge pārśvayorvā balam nyaset. 260
131. Asyate kṣipyate yat tu mantrayantrāgnibhiśca tat
astram tadanyataḥ śastram asikuntādikam ca yat.
132. Astram tu dvividham jñeyam nālikam māntrikam
tathā.
133. Yadā tu māntrikam nāsti nālikam tatra dhārayet
saha śastreṇa nrpatirvijayārtham tu sarvadā. 265
134. Laghudirghākāradhārabhedaiḥ śāstrāstranāmakam
prathayanti navam bhinnam vyavahārāya tad vidāḥ.
135. Nālikam dvividham jñeyam brhatkṣudravibhedataḥ.
- * 136. Tiryagūrdhvacchidramūlam nālam pañcavitastikam;
mūlāgrayorlaksyabheditilabinduyutam sadā. 270

130. He should place the friendly army near in the rear or on
both sides.
131. Whatever is thrown or cast by incantation, machine or fire Projectiles
is a projectile, what is different is a weapon like the weapons.
sword, the spear, &c.
132. The projectile weapon must be known to be of two kinds, Incanta-
tion arms,
that consisting of tubes and that thrown by incantation. guns,
and other
weapons.
133. If here there are no incantation-arms a king should always
keep for the sake of victory the tubular arms together
with other weapons.
134. According as a new weapon and missile varies in its size,
whether it is small or large, in its shape or blade,
experts name it differently.
135. The tubular weapon should be known as being of two
kinds, divided into large and small.
136. The tube is five spans long, its breech has a perpendicular Gun.
and horizontal hole, at the breech and muzzle is always
fixed a sesam bead for aligning the sights.

137. Yantrāghātāgnikṛt grāvacūrṇadhṛk karnamūlakam
sukāṣṭhopāṅgabudnam ca madhyaṅgulabilāntaram.
138. Svānte'gnicūrṇasandhātrśalākāsamnyutam drdham
laghunālikam apyetat pradhāryam pattisādibhiḥ.
139. Yathā yathaitat tvaksāram yathā sthūlabilāntaram 275
yathā dirghabhṛhadgolam dūrabhedi tathā tathā..
140. Mūlakilabhramāt lakṣyasamasandhānabhāji yat
brhannālikasañjñam tat kāṣṭhabudhnavivarjitam
pravāhyam śakāṭadyaistu suyuṅktam vijayapradam.
141. Suvarcilavanāt pañca palāni gandhakāt palam 280
antardhūmavipakvarkasnuhyādyāṅgarataḥ palam ;

137. The breech has at the vent a mechanism which, carrying stone and powder, makes fire by striking. Its breech is well wooded at the side, in the middle is a hole an angula broad ;
138. after the gunpowder is placed inside, it is firmly pressed down with a ramrod. This is the small gun which ought to be carried by foot-soldiers.
139. In proportion as its outside (bark) is hard, its hole is broad, its ball is long and broad ; the ball reaches far.
140. A big tube is called (that gun) which obtains the direction of the aim by moving the breech with a wedge ; its end is without wood ; but it is to be drawn on cars, &c. ; if well welded it gives victory.
141. Five weights (pala) of saltpetre, one weight of sulphur, Gun-
one weight of charcoal, which consists of *Calatropis powder*,
gigantea, of *Euphorbia neriifolia*, and other (plants) and
is prepared in such a manner that the smoke does not
escape ;

142. Śuddhāt saṅgrāhya sañcūrṇya sammilya prapūṣet rasaiḥ
snuhyarkāṇām rasonasya śoṣayet ātapena ca ;
piṣṭvā śarkaravat caitat agnicūrṇam bhavet khalu.
143. Suvarcilavanāt bhāgāḥ ṣaṭ vā catvāra eva vā 285
nālāstrārthāgnicūrṇe tu gandhāṅgarau tu pūrvavat.
144. Golo lohamayo garbhaguṭikāḥ kevalo'pi vā
śisasya laghunālārthe hyanyadhātubhavo'pi vā.
145. Lohasāramayam vāpi nālāstram tvanyadhātujam
nityasammārjanasvaccham astrapātibhirāvṛtam. 290
146. Aṅgārasyaiva gandhasya suvarcilavanasya ca
śilāyā haritalasya tathā sisamalasya ca.
147. Hīṅgulasya tathā kāntarajasāḥ karpurasya ca
jatornilyāśca saralaniryāsasya tathaiva ca.

142. if all this is taken after having been cleansed, is then powdered, and mixed together, one should squeeze it with the juice of *Calatropis gigantea*, *Euphorbia neriifolia* and *Allium sativum* and dry in the sun ; having ground this like sugar, it will certainly become gunpowder.
143. There may be six or even four parts of saltpetre in the gunpowder used for tubular arms, but the parts of sulphur and charcoal remain as before.
144. The ball is made of iron, and has either small balls in its inside or is empty ; for small tubular arms it should be of lead or of any other metal.
145. The tubular projectile weapon is either of iron or of another metal, it is every day to be rubbed clean, and covered by gunners.
146. With a similar greater or less proportion of charcoal, sulphur, and saltpetre, of realgar, of opiment and likewise of graphite ;
147. of vermilion, also of powder of magnetic iron oxide and of camphor, of lac, and of indigo and likewise of the pine gum (*Pinus longifolia*),

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148. Samanyūnādhikhairaṁśairagnicūrṇānyanekaśaḥ 295
kalpayanti ca vettāraḥ candrikābhādimanti ca.
149. Kṣipanti cāgnisamyogāt golam lakṣe sunālagam.
150. Nālastram śodhayet ādau dadyāt tatrāgnicūrṇakam ;
nivesayet tat daṇḍena nālamūle yathā dr̥ḍham.
151. Tataḥ sugolakam dadyāt tataḥ karṇe'gnicūrṇakam, 300
karṇacūrṇāgnidānena golam lakṣye nipātayet.
152. Lakṣyabhedī yathā bāṇo dhanurjyāviniyojitāḥ
bhavet tathānusandhāya dvihastaśca śilimukhaḥ.
153. Aṣṭāśrā pr̥thubudhnā tu gādā hr̥dayasaṁhitā ;
paṭṭiśaḥ svasamo hastabudhnaścobhayatomukhaḥ. 305

148. experts make gunpowder in many ways and of white and other colours.
149. By the application of fire they throw the ball coming from Gun-ball. the tube at the mark.
150. One should clean the tube first and then put gunpowder, About
carry it down with the ramrod to the bottom of the tube loading
till it is tight, and clean-
ing a gun.
151. then put a good ball, and place gunpowder on the vent,
and by setting fire to the powder at the vent discharge
the ball towards its mark.
152. In order that the arrow despatched by the string of the Bow,
bow should penetrate the object aimed at, the arrow arrow.
which is put on should be two cubits long.
153. A club is octagonal, but broad at the end, rising (from the Club.
ground) up to the heart; a battle axe is of the same Battle
height (as the bearer), is in the middle one cubit axe.
broad and is double-headed.

154. Īśadvaktraścaikadhāro vistāre caturaṅgulaḥ
kṣuraprānto nābhisamo dr̥ḍhamuṣṭissucandraruḥ
khaḍgaḥ, prāsaścaturhastadaṇḍabudhnaḥ kṣurānanaḥ.
155. Daśahastamitaḥ kuntaḥ phalāgrah śaṅkubudhnaḥ.
156. Cakram śaḍhastaparidhi kṣuraprāntam sunābhīyuk, 310
trihastadaṇḍaḥ trisikho, loharajjuh supāśakah.
157. Godhūmasaṁhitasthūlapatram lohamayam dr̥ḍham,
kavacam saśirastrāṇam ūrdhvakāyaviśobhanam.
158. Tikṣṇāgram karajam śreṣṭham lohasāramayam dr̥ḍham.
159. Yo vai supuṣṭasambhāraḥ tathā śaḍgunamantravit 315
bahvastrasamyuto rājā yoddhum icchet sa eva hi,
anyathā duḥkham āpnoti svarājyāt bhraśyate' pi ca.

154. The sword is a little curved, has one blade, is four angulas Sword.
broad, at the point sharp as a razor, reaches up to the
navel, has a strong hilt and is as brilliant as the
beautiful moon. The broad sword is four cubits long, Broad
broad (at the hilt), and at the end-point sharp like a sword.
razor.
155. The lance is ten cubits long, ending in a (metal) point, Lance.
and broad as a shaft.
156. The disk is six cubits in circumference, is at the edge Disk.
like a razor and is to be handled in the very midst; Trident.
the trident is three cubits long; a good lasso has iron Lasso.
strings.
157. Armour consists of scales of the breadth of a grain of Armour.
wheat, is of metal and firm, has a protection for the
head, and is ornamented on the upper part of the body.
158. The fingertip of a gauntlet which is sharp at its end, is Gauntlet.
of metal and is strong, is surely the best.
159. That king who has well supplied provisions, knows the Rules
secret of the six principles of policy (see Gl. 174), and about fighting.
has many weapons, wishes certainly to fight; if he is
not in such position (and fights), he experiences
distress, and is even expelled from his kingdom.

160. Ābibhratoḥ śatrubhāvam ubhayoḥ samyatātmanoh
astrādyaiḥ svārthasiddhyartham vyāpāro yuddham
ucyate.
161. Mantrastrairdaivikam yuddham, nālādyaiśca tathā
'suram
śastrabāhusamuttham tu mānavam yuddham iritam.
162. Ekasya bahubhiḥ sārddham bahūnām bahubhiśca vā
ekasyaikena vā, dvābhyām dvayor vā, tat bhavet khalu.
163. Kālam deśam śatrubalam dṛṣṭvā svīyabalam tataḥ
upāyān śaḍguṇam mantram sambhūyāt yuddhakāmu-
kah. 325
164. Śaraddhemantasisirakālo yuddheṣu cottamaḥ
vasanto madhyamo jñeyo'dhamo grīṣmaḥ smṛtaḥ sadā.
165. Varṣāsu na praśamsanti yuddham sāma smṛtam tadā.
-
160. The exertion of two self-controlled (parties) who harbour Definition
enmity against each other with projectile weapons of war.
and other arms for the accomplishment of their own
benefit, is called war.
161. The fighting with incantations and projectile weapons Different
is called divine, that with tubes and other instruments mode of
demoniac, that with weapons and the arms (of the fighting.
body) is human.
162. If one fights with many, or many fight against many, or
one fights against one, or two against two, that is surely
a contest.
163. Having considered the time, place, the hostile army and
also his own, the (four) expedients (i.e., negotiation,
bribery, dissension and attack), the secret of the six
principles of policy, he should think of war.
164. Autumn, winter and the chilly season are the best for Seasons of
fighting, spring time should be regarded as middling, the year to
and the hot season always as the worst. be con-
sidered.
165. In the rainy season they do not recommend war; for that
time negotiation is advised.

166. Yuddhasambhārasampanno yadādhikabalo nṛpaḥ
manotsāhi suśakunotpāti kālāḥ tadā śubhaḥ. 330
167. Kārye'tyavaśyake prāpte kālō no cet yadā śubhaḥ
nidhāya hr̥di viśveśam gehe cihnam iyāt tadā.
168. Na kālaniyamaḥ tatra gostrivipravināśane.
169. Yasmin deśe yathākālam sainyaḥ vyāyāmaḥ bhūmayāḥ
parasya viparītāśca smṛto deśaḥ sa uttamaḥ.¹⁴⁶ 335
170. Ātmanaśca pareṣām ca tulyaḥ vyāyāmaḥ bhūmayāḥ
yatra madhyama uddiṣṭo deśaḥ śāstravicintakaiḥ.¹⁴⁷
-
166. When a king has acquired all war materials, is very strong,
persevering in his mind, (and) has obtained auspicious
omens, then is the time.
167. But if the business is unavoidable, and the time is not Unavoid-
propitious, he should go, after having meditated in able
his mind on the Supreme Spirit and placed a (divine) war to be
symbol in his house. accepted.
168. There is no restriction as to time (for fighting) when cows,
women, and Brahmans are being destroyed.
169. That position in which there are at the necessary time Man-
fields fit for the manœuvring of troops, the position œuvring.
of the enemy being in this respect different, is men-
tioned as the best.
170. If his own good manœuvring fields and those of his enemies
are equally good, the position is called a middling one
by war experts.

¹⁴⁶ See Kamandakiya, XVI, 19.¹⁴⁷ See Kamand., XVI, 20.Ātmanaśca pareṣām ca tulyaḥ vyāyāmaḥ bhūmayāḥ
sumadhyamaḥ sa uddiṣṭo deśaḥ śāstravicintakaiḥ.

171. Arāṭisainyavyāyāmasuparyāptamahītalāḥ
ātmano viparītaśca sa vai deśo'dhamāḥ smṛtāḥ.¹⁴⁹
172. Svasainyāt tu tritīyāmsāhinam śatrubalam yadi
asikṣitam asāram vā sādyaścam svajayāya vai. 340
173. Putravat pālitaṃ yat tu dānamānavivarddhitam
yuddhasambhārasampannam svasainyam vijayapradam.
174. Sandhim ca vighrahaṃ yānam āsanam ca samāśrayam
dvaidhibhāvam ca saṃvidyāt mantrasyaitānstu śadgūṇān 345
175. Yābhiḥ kriyābhiḥ balavān mitratām yāti vai ripuḥ
sā kriyā sandhiriti yuktā vimrśet tām tu yatnataḥ.
176. Vikarṣitaḥ san vādhīno bhavet śatrustu yena vai
karmanā vighrahaṃ tam tu cintayet mantribhirnṛpaḥ.

171. If the ground is favorable for the manœuvres of the army
of the enemy, his position being quite the reverse,
that position is mentioned as the worst.
172. If the hostile army is a third part less than his own, if its
line is undisciplined and inefficient, (such circum-
stances) ensure his own victory.
173. If his own army is guarded like a son, is gratified by
presents and honours, is provided with the materials
for war, it is conferring victory.
174. He should understand the six principles of policy; alliance
and quarrel, marching, halting, refuge and separation. Six prin-
ciples of policy.
175. By what practices a strong enemy is won over to friendship, Alliance.
that practice is called alliance; he should consider it
anxiously.
176. A king should deliberate with his ministers about the war, War.
by means of which his enemy may be injured and
rendered dependent.

¹⁴⁹ See Kāmand., XVI, 21.

77. Śatrunāśarthagamanam yānam svābhīṣtasiddhaye
svarakṣaṇam śatrunāśo bhavet sthānāt tadāsanam. 350
78. Yairgupto balavān bhūyāt durbalo'pi sa āśrayaḥ,
dvaidhibhāvaḥ svasainyānām sthāpanam gulmagulma-
taḥ.
79. Baliyasābhiyuktastu nṛpo'nanyapratikriyāḥ
āpannaḥ sandhim anvicchet kurvāṇaḥ kālayāpanam. 355
180. Eka evopahāraṣtu sandhiraśa mato hitaḥ,
upahāraśya bhedaṣtu sarve'nye maitravarjitāḥ.¹⁴⁹
181. Abhiyoktā baliyastvāt alabdhvā na nivartate
upahārādṛte yasmāt sandhiranyo'na vidyate.¹⁵⁰
177. The going for the destruction of the enemy for the fulfil- Marching.
ment of his own desires is marching; if through
staying his own safety and his enemy's destruction is Halting.
obtained, that is halting.
178. The protection which makes a weak man become strong, is Refuge.
called refuge; the placing of his own armies in Separation.
different corps is separation.
179. If a king is attacked by a strong enemy and is not able to Political
resist, he should (thus) afflicted make peace, obtaining advice.
delay of time.
180. Alliance alone is regarded as a pleasant tribute; but all
the other kinds of tributes are destitute of friendship.
181. As an enemy who has not received any benefit from his
superior strength does not return (to his country);
therefore no peace is known without a tribute.

¹⁴⁹ See Kāmand., IX, 21, and Hitopadeśa, IV, 126.

¹⁵⁰ See Kāmand., IX, 22.

Abhiyoktā baliyasmāt alabdhvā na nivartate
upahārādṛte tasmāt sandhiranyo'na vidyate.

182. Śātrorbalānusārena upahāram prakalpayet
sevām vāpi ca svikuryāt dadyāt kanyām bhuvam dha-
nam. 360
183. Svasāmantaśca sandhiyāt maitrenānyajayāya vai
sandhiḥ kāryo'pyanāryeṇa samprāpyotsādayet hi sah.
184. Saṅghātavan yathā veṇurnividaiḥ kṇṭakairvṛtaḥ
na śakyate samucchettum veṇuḥ saṅghātavanstathā. 365
185. Balinā saha sandhāya bhaye sādharāṇe yadi,
ātmānam gopayet kālē bahvāmītreṣu buddhimān.
186. Balinā saha yoddhavyam iti nāsti nidarśanam
pratīvātā hi na ghaṇaḥ kadācit api sarpati. 362

182. He should settle a tribute according to the strength of his
enemy, or he should agree to do homage, or should
give his daughter, land or money.
183. For the sake of conquering his enemy he should make an
alliance with his neighbours; an alliance is even to be
made with an unworthy ruler; having gained his object
he may destroy him.
184. As a clump of bamboos surrounded by thick thorns cannot
be torn out, thus also could not be annihilated Veṇu (?)
who had a multitude of followers.
185. A wise king who has many enemies should guard himself in
calamity by making an alliance with a strong king, who
is exposed to the same danger.
186. There exists no example (to show), that one should fight
with a strong enemy; a cloud surely does not move
against the wind.

¹⁸¹ See Hitop., IV, 26.

Saṅghātavat yathā Veṇurnividaiḥ kṇṭakairvṛtaḥ
na śakyate samucchettum bhrātṛsaṅghātavanstathā.
Pāñc., III, 50. Saṅghātavan yathā veṇurnividaiḥ kṇṭakairvṛtaḥ
na śakyate samucchettum durbalopi tathā nṛpaḥ.
Kāmandakiya, IX, 46.

Saṅghātavan yathā veṇurnividaiḥ kṇṭakairvṛtaḥ
na śakyate samucchettum bhrātṛsaṅghātavanstathā.

All MSS. of the Śukraniti read Veṇuḥ saṅghātavanstathā.

¹⁸² See Hitop., IV, 27; Pañcatantra, III, 22; Kāmandakiya, III, 46.

187. Baliyasi praṇamatām kālē vikramatām api
sāmpado na visarpanti pratipam iva nimnagāḥ.
188. Rājā na gacchet viśvāsam sandhito' pi hi buddhimān
adrohasamayam kṛtvā vṛtram indraḥ purā'vadhit. 375
189. Āpanno' bhyudayakāṅkṣi pīdyamānaḥ pareṇa vā
deśakālabalopetaḥ prārabheta ca vighraham.
190. Prabhābalamitram tu durgastham hyantarāgatam
atyantaviśayāsaktam prajādravyāpahārakam;
bhinnamantribalam rājā pīdayet pariveṣṭayan.
191. Vighrahaḥ sa ca vijñeyo hyanyaśca kalahaḥ smṛtaḥ. 380
192. Baliyasātyalpabalaḥ śūreṇa na ca vighraham
kuryāt ca vighrahe punsām sarvaśaḥ prajāyate.

187. The power of those kings, who bow to a strong enemy,
but fight at another time, does not glide away, as
rivers do not flow against the stream.
188. A wise king does not enter into confidence even if he has
made an alliance; Indra after having made friendship
killed in ancient times Vṛtra.
189. When unfortunate, or hoping for success, or troubled by
an enemy, one should commence war only, after having
obtained the (right) place, time and army.
190. A king should beleaguer and oppress an enemy who is defi-
cient in army and in friends, who stays in his fortress,
who has invaded his country, who is much addicted to
women, who robs his subjects of their money, and
whose ministers and army are disaffected.
191. This is regarded as war, but a quarrel is regarded as a
different thing.
192. A very weak one should not go to war with a strong enemy,
for in such a combat of men occurs general destruction.

¹⁸⁸ See Pāñc., III, 7; Kāmand., IX, 50 to śloka 187; and Kāmand., IX,
53 to śloka 188.

193. Ekārthābhinivēśitvam kāraṇam kalahasya vā
upāyāntaranāse tu tato vighrahaṃ ācāret.
194. Vighrhya sandhāya tathā sambhūyātha prasāṅgataḥ
upekṣayā ca nipunairyānam pañcavidham smṛtam.¹⁵⁴ 385
195. Vighrhya yāti hi yadā sarvān śātrugaṇān balāt
vighrhya yānam yānājñaiḥ tadācāryaiḥ pracakṣyate.¹⁵⁵
196. Arimitrāṇi sarvāṇi svamitraiḥ sarvato balāt
vighrhya cāribhīrantum vighryagamanam tu vā.¹⁵⁶ 390
197. Sandhāyānyatra yātrāyām pārṣṇigrāheṇa śātrunā
sandhāyagamanam proktam tajjigīṣoḥ phalārthinaḥ.¹⁵⁷

193. If the cause of the quarrel is the desire to have one and the same object, one may proceed to war, if no other means exists (to settle the matter).

194. Five different modes of marching are mentioned by experts, Marching- a successful war march, an alliance march, a junction march, likewise an incidental march, and a contemptuous march.

195. If by his strength all hostile troops are conquered, it is called by the masters who know the marching rules, a successful war march.

196. If, when marching against one's own enemies, all the friends of the enemy are everywhere conquered through the ability of one's own friends, this is also called a successful war expedition.

197. When, while marching against one enemy, an alliance is made with another enemy, who is coming in his rear, this is called the alliance march of the king desirous success.

¹⁵⁴ See Kamand., XI, 2, instead of *upekṣayā* ca *upekṣā* ceti.

¹⁵⁵ See Kamand., XI, 3.

¹⁵⁶ See Kamand., XI, 4, instead of *ari* arer, and instead of *cāribhīrantum* "cābhigamanam."

¹⁵⁷ See Kamand., XI, 5.

198. Eko bhūpo yadaikatra sāmantaḥ sāmparāyikāḥ
śaktiśaucayutairyānam sambhūyagamanam hi tat.¹⁵⁸
199. Anyatra prasthitāḥ saṅgāt anyatraiva ca gacchati
prasāṅgayānam tat proktam yānaviddhīṣca mantribhiḥ.¹⁵⁹ 395
200. Ripum yātasya balinaḥ samprāpya vikṛtam phalam
upekṣya tasmin tadyānam upekṣāyānam ucyate.¹⁶⁰
201. Durvṛtte' pyakulīne tu balam datāri rajyate
hr̥ṣtam kṛtvā sviyabalam paritoṣyapradānataḥ.

198. If a king marches against an enemy together with his warlike, powerful and valiant neighbours, that is called going together.

199. If, after having set out against one enemy, he marches by circumstances (compelled) against another enemy, this is called by those who understand marching and by ministers, an incidental march.

200. If, when a strong king marches against an (insignificant) enemy, an advantage not worth having has been obtained and this has been given up, this is called a march conducted with contempt.

201. An army is even attached to a bad and low born king if ^{Liberality} he is only liberal, having pleased his own army by ^{towards} gifts of presents.

¹⁵⁸ Compare Kamandakiya, XI, 6.

Ekihūya yadaikatra sāmantaḥ sāmparāyikāḥ
śaktiśaucayutairyānam sambhūyagamanam hi tat.

¹⁵⁹ Compare Kamandakiya, XI, 9.

Anyatra prasthitāḥ saṅgāt anyatraiva ca gacchati
prasāṅgayānam tat proktam atra śalyo nidarsanam.

¹⁶⁰ Compare Kamandakiya, XI, 10.

Ripum yātasya balinaḥ samprāpyāvīkṛtam phalam
upekṣya tanmitrayānam upekṣāyānam ucyate.

202. Nāyakaḥ purato yāyāt pravīrapuruṣāvṛtaḥ
madhye kalatram kośaśca svāmi phalguca yaddhanam,¹⁶¹
dhvajinim ca sadodyuktaḥ sa gopayet divānisam.¹⁶² 400
203. Nadyadrivanadurgesu yatra yatra bhayam bhavet
senāpatih tatra tatra gacchet vyūhikṛtairbalaiḥ.¹⁶³
204. Yāyāt vyuhena mahatā makareṇa purobhaye;
śyenenobhayapakseṇa sūcyā vā dhiravaktrayā.¹⁶⁴ 405
205. Pāścādbhaye tu śakaṭam pārsvayorvajrasaṅjñikam
sarvataḥ sarvatobhadram cakram vyālam athāpi vā;¹⁶⁵
yathadeśam kalpayet vā śatrusenāvibhedakam.
206. Vyūharacanasanketān vādyabhāṣāsamiritān 410

202. The commander-in-chief should go in front, surrounded by valiant men, in the midst should be the queen, the treasury, the king, and whatever ready money there is; and he should always zealously guard his army day and night.
203. Wherever, whether in a river, mountain, forest or fortress an alarm of the enemy (coming) arises, there should the general go with combined forces.
204. If the alarm arises in front, he should march in an array resembling a crocodile, a double-winged hawk or a needle with a strong point. Different formations of troops.
205. A king should form if the alarm rises in the rear what is called a cart, if on the flanks a thunderbolt, if on all sides, an everywhere impregnable figure, a wheel and an elephant for the destruction of the hostile army according to the fitness of the place.
206. Nobody except his own soldiers should know the intima- Signals.

¹⁶¹ See Hit., III, 70; Kāmand., XVIII, 45.

Nāyakaḥ purato yāyāt pravīrapṛtanāvṛtaḥ

madhye kalatram svāmi ca kośaḥ phalgu mahaddhanam.

¹⁶² See Kāmandakīya, XVIII, 43.

¹⁶³ See Kāmand., XVIII, 44; Hitop., III, 69; and compare Manu, VII, 188.

¹⁶⁴ See Kāmand., XVIII, 48.

¹⁶⁵ See Kāmand., XVIII, 49.

Pāścādbhaye tu śakaṭam pārsvayorvajrasaṅjñitam
sarvataḥ sarvatobhadram bhayavyuham prakalpayet.

- svasainikairvinā kopi na jānāti tathāvidhān,
niyojayet ca matimān vyūhān nānāvidhān sadā.
207. Aśvānām ca gajānām ca padātinām prthak prthak
uccaiḥ samśrāvayet vyūhasanketān sainikān nṛpaḥ.
208. Vāmadakṣiṇasamsthā vā madhyasthā vāgrasamsthā
śrutvā tān sainikaiḥ kāryam anusīṣṭam yathā tathā. 415
209. Sammilanam prasaraṇam paribhramaṇam eva ca
akuñcanam tathā yānam prayāṇam apayānakam;
210. Paryāyeṇa ca sāmukhyam samutthānam ca lunṭha-
nam 420
samsthānam cāṣṭadalavat cakravat golatulyakam;
211. Sūcitulyam śakaṭavat ardhaśāstrasamam tu vā
prthagbhavanam alpāpaiḥ paryāyaiḥ pañktiveśanam;
212. Śāstraśrayordhāraṇam ca sandhānam lakṣyabhedanam
mokṣaṇam ca tathāśāstrānām śāstrānām parighātanam.

tions for the arrangement of troops, communicated by words or signals; and a wise man should always prescribe different formations.

207. A king should make his soldiers hear distinctly the formation-signals for the elephants, horses and foot-soldiers each separately;
208. whether he stands on the left or right, in the midst or is placed in front; the soldiers, when they hear these signals, should do according as they are taught.
209. They should concentrate, spread, wheel round, fall in, Man-
œuvres. march, double and retreat;
210. now face or rise and lie down on the ground, or stand like an octagon, like a wheel, like a ball;
211. like a needle, like a car, or like the halfmoon, skirmish in small numbers, form rows in regular order;
212. take up weapons and arms, aim at and hit the mark, discharge missiles and strike with weapons,

213. Drāk sandhānam punaḥ pāto graho mokṣaḥ punaḥ
punaḥ ;
svagūhanam pratighātaḥ śāstrāstrapadavikramaiḥ. 425
214. Dvābhyām tribhīscaturbhirvā pañktiśo gamanam tataḥ ;
tathā prāgbhavanam cāpasaraṇam tūpasarjanam
apasrtyāstrasiddhyartham upasrtya vimokṣaṇam.
215. Prāgbhūtvā mocayet astraṁ vyūhasaḥ sainikāḥ sadā
āsinaḥ syāt vimuktāstraḥ prāgvā cāpasaret punaḥ.
216. Prāgāsinam tūpasrto dr̥ṣṭvā svāstraṁ vimocayet 430
ekaikaśo dvīśo vāpi saṅghaśo bodhito yathā.
217. Krauñcānām khe gatiryādṛk pañkṭitaḥ samprajāyate
tādṛk samrakṣayet krauñcavyūham deśabalam yathā,
218. Sūkṣmagrīvam madhyapuccham sthūlapakṣam tu
pañkṭitaḥ 435
br̥hatpakṣam madhyagalapuccham śyenam mukhe
tanum.

213. then quickly aim again, and throw, take up and discharge
the arms repeatedly, cover themselves, and beat with
arms, weapons and feet ;
214. further go in rows of two, three or four ; likewise, front,
retire and change places ; retire for adjusting the
arms and advance for the discharge.
215. A soldier when standing in his corps should always
discharge his arms from the front, if he has discharged
the arms he should sit down, or should leave the front.
216. But (the next soldier) advancing should discharge his
weapon keeping his eye on him who sits in front, either
one by one, or in twos or in numbers, according to the
order.
217. As the moving of the herons proceeds in the sky, he should
arrange the herons' array, according as it is adapted to
the country ;
218. with a thin neck, a middling tail, a bulky wing, arranged

219. Catuspād makaro dīrghasthūlavakro dviroṣṭhakaḥ
sūci sūkṣmamukho dīrghasamadaṇḍāntarandhrayuk.
220. Cakravayūhaḥ caikamārgo hyaṣṭadhā kuṇḍalikṛtaḥ
caturdikṣvaṣṭaparidhīḥ sarvatobhadrasañjñikāḥ. 440
221. Amārgaścāṣṭavalayī golakaḥ sarvatomukhaḥ
śakataḥ śakatakāro vyālo vyālakṛtīḥ sadā.
222. Sainyam alpam br̥hadvāpi dr̥ṣṭvā mārgam ranasthalaṁ
vyūhairvyūhena vyūhābhyām saṅkareṇāpi kalpayet.
223. Yantrāstraīḥ śatruśenāyā bhedo yebhyaḥ prajāyate, 445
sthalebhyasteṣu santīṣṭhet sasaṁyo hyāsanam hi tat.
224. Tṛṇānnajalasambhārā ye cānye śatruṣaḥ
saṁyak nirudhya tān yatnāt paritāṣṭiram āsanāt.

in rows, (and) a hawk-array with a broad wing, a
middling throat and tail and thin at the face.

219. The crocodile has four feet, a long and broad snout and
two lips. A needle has a thin face, a long and even
stick-like body, and a hole at its end.
220. The wheel array has one way, but eight coils. A figure
with eight rings and with four faces is called a *Sarvato-*
bhadra (a strong one on every direction).
221. A ball has no entrance, eight circles and everywhere a
face ; a cart is like a cart and an elephant has always
the shape of an elephant.
222. Having seen the army, the road, the battlefield, whether
small or big, he should arrange his army in many
corps, or in one or two, or in one mass.
223. Where a gap may be made in the hostile army through Post.
missiles and machines, in these places the king should
stand with his army ; this is called post.
224. Having with great exertion effectually removed from his
post all round and for a long time to come grass, food,
water and other provisions, which maintain the enemy ;

225. Vicchinnavividhāsāram prakṣinayavasaindhanam, 450
vighyamānaprakṛtim kālenaiva vāsam nayet.¹⁶⁶
226. Aśeśa vijigīṣośca vighrahe hiyamānayoh
sandhāya yadavasthānam sandhāyāsanam ucyate.¹⁶⁷
227. Uccidīyamāno balinā nirupāyapratikriyāḥ,
kulodbhavam satyam āryam āśrayeta balotkṛtām. 455
228. Vijigīṣostu sāhyarthāḥ suhṛtsambandhibāndhavāḥ
pradattabhṛtikā hyanye bhūpā aśisaparakalpitaḥ.
229. Saivāśrayastu kathito durgāni ca mahātmabhiḥ.
230. Anīcitopāyakāryāḥ samayanucaro nṛpaḥ
dvaidhibhāvena varteta kākākṣivat alakṣitam, 460
pradarśayet anyakāryam ānyam ālambayet ca vā.

225. he should subdue in time the enemy, whose various provisions are scattered, whose corn and fuel is destroyed and whose subjects are incensed.
226. If the enemy and the king who wishes to conquer are reduced in the war, the place where they stand, when they make peace, is called the place produced by peace.
227. If a king who has no means of redress is much oppressed by a strong king he should take refuge with a king, who is well-born, righteous, venerable and of superior strength. Refuge.
228. A king (who wishes to conquer) has friends, connections and relations who assist for the sake of friendship, others who have received pay, and kings on whom is settled a part (of the enemy's country).
229. By great-minded men this is surely called refuge and a fortress is also called a refuge.
230. A king, whose arrangements are not certain, looking out for the opportune time, should practise duplicity like the concealed eye of a crow, he should pretend one thing and seize another. Duplicity

¹⁶⁶ See Kāmand., XI, 16.¹⁶⁷ See Kāmand., XI, 17.¹⁶⁸ See Kāmand., XI, 24b.

231. Sadupāyaisca sanmantraiḥ kāryasiddhirathodyamaiḥ
bhavet alpajanasyāpi kim punarṇpaterna hi.
232. Udyogenaiva siddhyanti kāryāni na manorathaiḥ.
233. Na hi suptamṛgendrasya nipatanti gajā mukhe¹⁶⁹; 465
ayo'bhedyam upāyena dravatām upaniyate.¹⁷⁰
234. Lokaprasiddham evaitat vāri vahuerniyāmakam
upāyopagrhitena tenaitat pariśoṣyate.¹⁷¹
235. Upāyena padam mūrdhni nyasyate mattahastinām¹⁷²
upāyeṣūttamo bhedaḥ sadguneṣu samāśrayaḥ. 470
236. Kāryau dvau sarvadā tau tu nṛpeṇa vijigīṣuṇā,
tābhyām vinā naiva kuryāt yuddham rājā kadācana.

231. The success of the undertaking of even an insignificant man may be ensured by clever stratagems, good councils and efforts, would this not be surely the case with a king?
232. Undertakings really succeed by efforts alone and not by wishes. ^{Necessity of exerting one-self.}
233. Elephants certainly do not fall into the mouth of the sleeping lion. The iron which cannot be broken is brought by expedients to fluidity.
234. That the water is the subduer of the fire is surely well known in the world, but it is dried up by that fire if assisted by proper means.
235. The foot is placed on the wild elephant by stratagem. Among all expedients the division of friends is the best; amongst the six principles of policy the refuge is the best.
236. These two ought always to be used by a king who wishes to conquer; without these two no king could ever undertake a war.

¹⁶⁹ See Hitop., 1, 36b.

na hi suptasya śimhasya praviśanti mukhe mṛgāḥ.

¹⁷⁰ See Kāmand., XI, 47b.¹⁷¹ See Kāmand., XI, 49. tenaiva instead of tenaitat.¹⁷² See Kāmand., XI, 46b.

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237. Paraspāram prātikūlyam ripusenāpamantrinām,
bhavet yathā tathā kuryāt tat prajāyāśca tat strīyāḥ.
238. Upāyān śadgunān vikṣya śatroḥ svasyāpi sarvadā,
yuddham prāṇātyaye kuryāt sarvasvaharaṇe sati. 475
239. Striviprābhyupapattau ca govināśepi brāhmaṇaiḥ,
prāpte yuddhe kvacinnaiva bhavet api parāṇmukhaḥ.
240. Yuddham utsrīya yo yāti sa devairhanyate bhr̥śam.
241. Samottamādhamaī rājā tvāhūtaḥ pālayan prajāḥ,
na nivarteta saṅgrāmāt kṣatradharmam anusmaran. 480
242. Rājānam cāpayoddhāram brāhmaṇam cāpravāsinam,
nirgilati bhūmiretau sarpo vilāṣayān iva. 174

237. He should contrive so that there is mutual enmity among the ministers and generals of the enemy and also among the subjects and women. General political advice.
238. In case his life is in danger, or all his property is to be taken, he should fight having always considered the six-fold expedients of his enemy and of himself.
239. If he has undertaken the war for the defence of women and Brahmins and on account of the destruction of cows even if done by Brahmins, he should never turn away.
240. Who goes away having left the fight is quickly destroyed by the gods.
241. A king who protects his subjects if he is summoned to fight by equal, superior, or inferior enemies should not turn from the contest remembering the duty of a Kṣatriya.
242. A king who does not fight and a Brahman who does not travel about; these two swallows the earth, like a snake does the animals living in holes.

173 See Manu, VII, 87.

174 See Mahabharata, Rajadharma, LVII, 1, and the observations on this sloka on pp. 204 and 205.

243. Brāhmaṇasyāpi cāpattau kṣatradharmaṇa vartataḥ,
prasastam jivitam loke kṣatram hi brahmasambhavam. 485
244. Adharmaḥ kṣatriyasyaisa yacchayyāmarānam bhavet,
visrjan śleṣmapittāni krpanam paridevayan. 175
245. Avikṣatena dehena pralayam yo' dhigacchati
kṣatriyo nāsyā tat karma prasamsanti purāvidaḥ. 176
246. Na grhe marānam śastam kṣatriyānam vinā raṇāt,
śaundirānam āsaundiram adharmam krpanam hi yat. 490
247. Raṇeṣu kadanam kṛtvā jñātibhiḥ parivāritaḥ
śāstrāstraiḥ suvinirbhinnāḥ kṣatriyo vadham arhati. 178

243. Even for a Brahman who lives during misfortune according to the Kṣatriya rule, it is in the world a laudable living, for a Kṣatriya is sprung from Brahma. Prescriptions for Kṣatriyas.
244. There would be a demerit to a Kṣatriya whose death would be on a couch, emitting phlegm and bile and wailing piteously.
245. Those persons who are acquainted with the past do not praise the death of that Kṣatriya who meets his dissolution with unwounded body.
246. The death of Kṣatriyas in a house without a combat is not praised; it would be despicable, unrighteous, and miserable.
247. A Kṣatriya has earned (a noble) death, when, surrounded by his relations, he has made a slaughter (of enemies) on the battle fields, and is well pierced with arms and missiles.

175 See Mahabharata, Śantiparva, Rajadharma, XCVII, 23.

176 See Mahabharata, Śantiparva, Rajadharma, XCVII, 24.

177 See ibidem, 25; instead of śastam tāta, and instead of vinā raṇāt prasasyate.

178 See ibidem, 28; but the second half of the sloka differs, for instead of it we read *tikṣṇaiḥ śāstrairabhikṣiṣāḥ kṣatriyo mṛtyum arhati*. The change in the reading *tikṣṇaiḥ śāstraiḥ* for *śāstrāstraiḥ* is significant.

248. Āhaveṣu mitho'nyonyam jighāṁsanto mahikṣitah
yudhyamānāḥ param śaktyā svargam yāntyaparāṁ-
mukhāḥ.¹⁷⁹ 495
249. Bharturartheṣa yaḥ śūro vikramet vāhinimukhe
bhayāt na nivarteta tasya svargo hyanantakaḥ.
250. Āhave nihataḥ śūram na śoceta kadācana¹⁸⁰
nirmuktaḥ sarvapāpebhyāḥ pūto yāti salokatām. 500
251. Varāṣarassahasrāṇi śūram āyodhane hatam
tvaramānāḥ pradhāvanti hyayam mama bhavet iti.¹⁸¹
252. Munibhirdirghatapasā prāpyate yat padam mahat
yuddhabhimukhanihataiḥ śūraiḥ tat drāk avāpyate.
253. Etat tapaśca puṇyam ca dharmāścaiva sanātanaḥ
catvāra āśramāstasya yo yuddhe na palāyate.¹⁸² 505

248. The rulers of the earth, who, wishing to kill each other
in battles, are fighting with utmost strength, go to
heaven with not averted heads.
249. That hero who fights for the sake of his king in front of the
army, nor turns away from fear, is sure of the ever-
lasting heaven.
250. One should never bewail a hero who is killed in battle,
freed from all sins he goes purified to the world specially
assigned to him.
251. Towards a hero who is killed in battle run thousands of the
best Apsaras, saying: "this one should be mine."
252. That grand step which after long penance is obtained by
sages, is quickly won by heroes, who are killed with
their faces turned towards the contest.
253. He who does not run away in the battle, earns this penance,
this merit, this primeval virtue and the four stages.

¹⁷⁹ See Manu, VII, 89; and Nitiprakāśika, VII, 44.

¹⁸⁰ Compare Mahābhārata, Rajadharma, XCVIII, 43b.

¹⁸¹ See Parāśarasamṛti, IV, 37; and Mahābhārata, ibidem, XCVIII, 45b
and 46a; the latter half śloka runs thus: tvaramānābhidhāvanti
mama bharta bhavet iti.

¹⁸² See Mahābhārata, ibidem XCVIII, 46b and 47a.

254. Na hi śauryāt param kiñcit triṣu lokeṣu vidyate
śūraḥ sarvam palāyati śure sarvam pratiṣṭhitam.¹⁸³
255. Carāṇām acarā annam adamṣṭrā damṣṭrīṇām api
apāṇayāḥ pāṇimatām annam śūrasya katarāḥ.¹⁸⁴
256. Dvāvimau puruṣau loka sūryamaṇḍalabhedinau
parivrāt yogayuktaśca rāṇe cābhimukho hataḥ.¹⁸⁵ 510
257. Ātmānam gopayet śakto vadhenāpyātātayinaḥ,
suvidyabrāhmaṇaguroryuddhe śrutinidarsanāt.
258. Ātatāyitvam āpanno brāhmaṇaḥ sūdravat smṛtaḥ
nātātayivadhe doṣo hanturbhavati kaścana.¹⁸⁶ 515

254. In the three worlds there is nothing known better than
heroism, the hero protects all, in a hero all is fixed.
255. The food of moving beings is the immoveable, of those
who have fangs those that have no fangs, of those
who have hands those who have no hands; the food
of the hero is the coward.
256. These two persons in the world have penetrated to the
sphere of the sun, the devotee who is immersed in
deep meditation, and he who is killed, whilst turned to
the battle.
257. A strong man may according to the order of the Veda When a
protect himself in the battle by slaying a preceptor, Brahman-
who is a learned Brahman, if he attempts his life. murder
allowed.
258. A Brahman who has committed a murder is regarded as a
Śūdra; for the murder of an assassin no fault whatever
is to be found with the person who kills him.

¹⁸³ See Mahābhārata, ibidem, XCIX, 18.

¹⁸⁴ See Mahābhārata, ibidem, XCIX, 15.

Carāṇām acarā hyannam adamṣṭrā damṣṭrīṇām api
apāṇ pipāsātām annam annam śūrasya katarāḥ.

¹⁸⁵ See Parāśarasamṛti, IV, 32.

¹⁸⁶ Compare Manu, VIII, 351a.

259. Udyamya śastram āyāntam bhrūṇam apyātataṣṭayinam
nihatya bhrūṇahā na syāt ahatvā bhrūṇahā bhavet.¹⁸⁷
260. Apasarati yo yuddhāt jīvitārthi narādhamah
jīvan eva mṛtaḥ sopi bhuṅkte rāṣṭrakṛtam tvagham.
261. Mitrām vā svāminam tyaktvā nirgacchati raṇāt ca yaḥ 520
so'nte narakam āpnoti sa jīvan nindyate'khilaiḥ.
262. Mitrām apadgatam dr̥ṣṭvā sahāyam na karoti yaḥ
akirtim labhate so'tra mṛto narakam rochati.¹⁸⁸
263. Visrambhāt śaranam prāptam śakṭaḥ tyajati durmatih
sa yāti narake ghore yavat indrāścaturdaśa. 525

259. He who has raised a weapon against an approaching assassin, though this be a Vaidika Brahman, (and) killed him, should not be considered as a Vaidikabrahman-murderer; if he has not killed him, he should be regarded as such.
260. He who desirous of his life goes away from the battle is a very bad man, though alive he is surely dead; he has to bear the sin done in the realm. Punishment of cowardice.
261. He who, having left his friend or his king, goes from the battle field, goes at his death to hell, and is blamed by all during his life.
262. He who, having seen his enemy going into danger, does not help him, acquires infamy here and goes, when dead, to hell.
263. The wicked, who though strong, deserts him who confidently comes to him for protection, stays in a fearful hell, as long as there are fourteen Indras.

¹⁸⁷ See Mahabharata, Śāntiparva, Rajadharma, LVI, 28-30, and p. 204.
Compare Manu, VIII, 350.

Gurum vā balavṛddhau vā brāhmaṇam vā bahuśrutam
atātayinam āyāntam hanyāt eva vicārayan;
and about bhrūṇahā Manu, VIII, 317.

¹⁸⁸ Compare with this and the preceding Śloka the Mahabharata as above,
20-21.

264. Sudurvṛttam yadā kṣātram nāśayeyustu brāhmaṇāḥ
yuddham kṛtvāpi śāstrāstrairna tadā pāpabhāgināḥ.
265. Hinam yadā kṣātrakulam nicairlokaḥ prapidyate
tadāpi brāhmaṇā yuddhe nāśayeyuḥ tu tān dhruvam. 530
266. Uttamam māntrikāstreṇa nālikāstreṇa madhyamam
śāstraiḥ kaniṣṭham yuddham tu bāhuyuddham tato'dha-
mam.
267. Mantreritamahāsaktibhādyaiḥ śatrunāśanam
māntrikāstreṇa tat yuddham sarvayuddhottamam smṛtam
268. Nālāgnicūrṇasamyogāt lakṣe golanipātanam
nālikāstreṇa tat yuddham mahākṛāsakaram ripoh. 535
269. Kuntādisāstrasaṅghātairnāśanam ripūṇām ca yat
śāstrayuddham tu tat jñeyam nālāstrābhāvataḥ sadā.
270. Karṣaṇaiḥ sandhimarmāṇām pratilomānulomataḥ
bandhanaairghātanam śatroyuktyā tat bāhuyuddhakam.
264. If the Brahmins should even with arms and missiles destroy in a war bad behaving Kṣatriyas, they do then commit no sin.
265. If, when the Kṣatriya caste is weak, the world is oppressed by mean persons, then also should the Brahmins surely destroy those in war.
266. The best fight is with enchanted missiles, the middling is with tubular projectile weapons, the lowest with weapons, the worst is fighting with the arms. Modes of Fighting.
267. The destruction of enemies by arrows and other weapons of great force and despatched by spells, and by enchanted missiles, is recorded as the best fighting of all.
268. The throwing of a ball by a tubular instrument through the application of gunpowder and a tube is very destructive to the enemy.
269. The destruction of the enemy which takes place by means of lances and other weapons, is always to be known as the combat with weapons in the absence of tubular projectile weapons.
270. The killing of the enemy by injuring his joints and vital

771. Nalāstrāṇi puraskṛtya laghūni ca mahānti ca
tat prsthagāṅśca pādātān gajāśvān pārśvayoh sthitān
kṛtvā yuddham prārabheta bhinnāmātyabalarīṇa
772. Sammukhyena prapātena pārśvābhyām apayānataḥ
yuddhānukūlabhūmestu yāvallābhastathāvidham.
773. Sainyārdhāmsena prathamam senapairyuddham iritam
amātyagopitaiḥ pascāt amātyaiḥ saha tat bhavet,
nrpaṅgopitaiḥ pascāt svataḥ prāṇātyaye ca tat.
774. Dirghadhvanipariśrāntam kṣutpipāsāhitaśramam¹⁹⁹
vyādhidurbhikṣamarāṇaiḥ piḍitam dasyuvidrutam;¹⁹⁰

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parts, by tossing him backwards and forwards, and by grasping him, is properly regarded as the fighting with the arms of the body.

271. Having placed the small and big guns in front ; and behind them the infantry, and on the two flanks the elephants and horses, he should begin the battle, when the hostile army and ministers are disunited,
272. by attacking the enemy in front, by falling on him with the two wings, by retreating, in such a manner so far as the advantage of the ground favours the combat.
273. The battle should be first opened by generals with half the army, it should then be continued by the ministers with the troops under their command, and at last by the king himself with the troops under his special orders, when life at large is at stake.
274. If his own army is exhausted by a long march, experiences distress through hunger and thirst, is destroyed by disease, famine and death, is alarmed by marauders;

¹⁸⁹ See Hitop., III, 108a.

Dirghavartmapariśrāntam nadyadrivanasāṅkulam.

¹⁹⁰ See Kamand., XVIII, 50.

Dirghe'dhvanī pariśrāntam kṣutpipāsāhitaśramam
vyādhidurbhikṣamarāṇaiḥ piḍitam dasyuvidrutam.

Hitop., III, 109a. Pramattam bhojanavyagram vyādhidurbhikṣapiḍitam

275. Pankapāṁsujalaskandhavyastam śvasāturam tatthā
prasuptam bhojane vyagram abhūmiṣṭham asaṁsthi-
tam;¹⁹¹
276. Ghorāgnibhayavitrastam vṛṣṭivātasamāhatam,¹⁹²
evamādiṣu jātiṣu vyasaneṣu samākulam
svasainyam sādhu rakṣet tu, parasainyam vināśayot.¹⁹³
277. Upāyān śadgunān mantram śatroḥ svasyāpi cintayan
dharmayuddhaiḥ kūtayuddhairhanyāt eva ripum sadā.
278. Yāne sapādabhrtyā tu svabhrtyān vardhayan nrpāḥ
svadeham gopayan yuddhe carmaṇā kavacena ca ;

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275. is troubled on the roads by much mud, dust and water, is also out of breath, is sleepy, is engaged in eating, has no proper place to stand upon, is in disorder ;
276. is frightened by the fear of horrible fires, is heavily exposed to wind and rain, and is distressed by such existing calamities, he should well guard it ; but he should destroy the army of his enemy, if it is in a similar state.
277. Considering the six-fold expedients and the design of his enemy and his own, he should surely always kill his enemy by fair and unfair fighting.
278. When the king gladdens his soldiers on the march with a quarter extra pay, protects his body in the battle with a shield and armour ;

¹⁹¹ See Kamandakīya, XVIII, 51b and 52a.

Pankapāṁsujalaklinnam vyastam puṇjikṛtam pathi
prasuptam bhojanavyagram abhūmiṣṭham asaṁsthitam.

Hitop., III, 109.

Pramattam bhojanavyagram vyādhidurbhikṣapiḍitam
asaṁsthitam abhūmiṣṭham vṛṣṭivātasamākulam.

¹⁹² See Hitop., III, 108b. Ghorāgnibhayasāstrastam kṣutpipāsārditam
tathā, and Kamandakīya, XVIII, 52b, Caurāgnibhayavitrastam
vṛṣṭivātasamāhitam.

¹⁹³ See Kamandakīya, XVIII, 53.

svasainyam sādhu rakṣeta parasainyam ca ghātayot.

279. Pāyayitvā madam samīyak sainikān śauryavarddhanam
nalāstreṇa ca khadgādyaibh sainiko ghātayet arim. 560
280. Kuntena sādī bāṇena rathago gajago'pi ca
gajo gajena yātavayah turageṇa turaṅgamah.
281. Rathena ca ratho yojyah pattinā pattir eva ca
ekenaikaśca śastreṇa śastram astreṇa vāstrakam.
282. Na ca hanyāt sthālārūḍham na klibam na krtāñjalim 565
na muktakesam āsinam na tavāsmi vādinam.¹⁹⁴
283. Na suptam na visannāham na nagnam na nirāyudham
na yudhyamānam paśyantam, yudhyamānam pareṇa ca.¹⁹⁵

279. has made his soldiers drink up to a state of intoxication—
the strengthener of bravery—; the soldier kills his enemy
with a tubular instrument (*gun*), swords and other
weapons.

280. A charioteer should be assailed by a lance, a person on a
carriage or elephant by an arrow, an elephant by an
elephant, a horse by a horse.

281. A carriage is to be opposed by a carriage, and a foot-soldier
certainly by a foot-soldier, one person by another person,
a weapon by a weapon, or a missile by a missile.

282. He should not kill a person, who is alighted on the ground, Who
nor one who is emasculated, nor one who has joined should not
his hands as a suppliant, nor one who sits with dis- be killed.
hevelled hair, nor one, who says, "I am thine;"

283. nor one who is asleep, nor one without a coat of mail, nor
a naked, nor an unarmed person, nor a combatant who
is looking on, nor one who is fighting with another;

¹⁹⁴ See Manu, VII, 91; Nitiprakāśikā, VII, 46; and Mahabharata, Raja-
dharma, XCVI, 3, and XCVIII, 48a.

¹⁹⁵ See Manu, VII, 92.

na yudhyamānam paśyantam na pareṇa samāgatam;
and Nitiprakāśikā, VII, 47.

284. Pibantam na ca bhuñjānam anyakāryākulam na ca 570
na bhitam na parāvṛttam satām dharmam anusmaran.¹⁹⁶
285. Vṛddho bālo na hantavyo naiva strī kevalo nrpaḥ,
yathāyogyam tu samyojya nighnan dharmo na hiyate.
286. Dharmayuddhe tu kṛte vai na santi niyamā amī
na yuddham kṛtasadrśam nāśanam balavadripoh. 575
287. Rāmakṛṣṇendradidevaiḥ kṛtam evādr̥tam purā;
kṛteṇa nihato Bālir Yavano Namuciḥ tathā.
288. Praphullavadanenaiva tathā komalayā girā
kṣuradhāreṇa manasā ripoh chidram sulakṣayet.
289. Pañcāśītīśatānikah senākāryam vicintayan 580
sadaiva vyūhasaṅketavādyasabdhāntavartinaḥ
sañcareyuh sainikāśca rājarāṣṭrahitaiṣiṇaḥ.

284. nor one who is drinking or eating, nor one engaged in
another matter, nor one who is frightened, nor one who
is running away; remembering the custom of the good.

285. Neither is an old man or a child to be killed, surely not a
woman and especially not a king. If one kills, having
fought in a suitable manner, no virtue is violated.

286. These restrictions exist in fair but not in unfair fighting,
for the destruction of a powerful enemy there is no fight-
ing like unfair fighting.

287. Unfair fighting was certainly observed by Rāma, Kṛṣṇa,
Indra and other gods; Bālī, Yavana and also Namuci
were killed by unfair fighting.

288. With a cheerful face certainly and with a pleasing voice,
but with a mind sharp as a razor he should always
keep in view the vulnerable point of the enemy.

289. A king with 8,500 soldiers should study the working of an Rules how
army, and the soldiers should always march, being well to drill an
army.
acquainted with the words (of command), the bugle-
calls, sounds, signs, and military arrays, wishing for
the welfare of the king and kingdom.

¹⁹⁶ See Manu, VII, 93b.

290. Bheditām śatruṇā dṛṣtvā svasenām ghātayet ca tām.
 291. Pratyagre karmaṇi kṛte yodhairdadyāt dhanam ca tān
 pāritoṣyam vādhikāram kramato' rham nṛpaḥ sadā.
 292. Jalānnatṛṇasamrodhaiḥ śatrum sampidya yatnataḥ 585
 purastāt viṣame deśe paścāt hanyāt tu vegavān.
 293. Kūtasvarṇamahādānairbhedayitvā dviṣadbalaṃ
 nityavisrambhasaṃsuptaṃ prajāgarakṛtāśramam,
 vilobhyapi parāṇikam apramatto vināśayet.
 294. Kṣaṇam yuddhāya sajjeta kṣaṇam cāpasaret punaḥ 590
 akasmāt nipatet dūrāt dasyuvat paritāḥ sadā.
 295. Rūpyam hemaca kupyam ca yo yat jayati tasya tat¹⁹⁷
 dadyāt kāryānurūpam ca hr̥ṣṭo yodhān praharṣayan.

290. A king having observed that his army has been won over
 by the enemy, he should destroy it.
 291. A king should always, after a fresh victory has been won Rewards
 by his soldiers, give them a gratifying reward, and for sol-
 deserving promotion in due order. diers.
 292. Having at first harassed the enemy in a hilly country by Harassing
 cutting off water, food and grass, he should afterwards the enemy.
 vanquish him.
 293. Having sown dissensions in the hostile army by great gifts
 of counterfeit gold, and having deceived the (remaining)
 inimical host, which is sleeping in complete security
 and tired out by watches, a vigilant king should
 destroy it.
 294. At one moment he should endeavour to fight, at another
 moment he should retreat again, he should suddenly
 fall upon him from far, being always on every side,
 like a robber.
 295. The silver, gold and copper, which a soldier wins, belong to Concern-
 him, and the king should eagerly, gratifying the warri- ing plun-
 ers, bestow on them rewards according to merit. der.

¹⁹⁷ See Manu, VII, 96.

296. Vijitya ca ripūn evam samādadyāt karam tathā
 rājyānsam vā sarvarājyam nandayeta tataḥ prajāḥ. 595
 297. Tūryamaṅgalaghoṣeṇa svakiyam puram āviśet
 tatprajāḥ putravat sarvāḥ pālayetātmasātkṛtāḥ.
 298. Niyojayet mantrigaṇam aparaṃ mantracintane
 deśe kāle ca pātre ca hyādimadhyāvasānataḥ 600
 bhavet mantraphalam kidṛk upāyena katham tviti.
 299. Mantryādyadhikṛtāḥ kāryam yuvarājāya bodhayet
 paścāt rājñe tu taiḥ sākam yuvarājo nivedayet.
 300. Rājā saṃśāsayet ādau yuvarājam tataḥ tu saḥ
 yuvarājo mantrigaṇān rājagre tē'dhikāriṇaḥ. 605
 301. Sadasatkarma rājānam bodhayet hi purohitaḥ.
296. Having thus conquered his enemy he should take tribute, Tribute.
 a part of the kingdom or the whole kingdom and
 gladden afterwards his subjects.
 297. He should enter his town amidst the propitious sound of
 musical instruments, and he should protect all the
 people confided to him like sons.
 298. He should appoint one set of ministers (for administration); Adminis-
 and another for the consideration of council, (to consider) trative
 according to place, time, and person, according to the and exe-
 beginning, midst or end, what means should be adopted cutive
 and what would be the result of the policy. officers.
 299. The prime minister should inform the crown prince of the Privy
 state of affairs, (and) the crown prince should together council.
 with these (ministers) afterwards impart it to the king.
 300. The king should at first issue instructions to the crown
 prince, the crown prince should then in the presence of
 the king give commands to the boards of ministers, and
 these to their officers.
 301. The priest should truly teach the king right and wrong. Priest.

302

ON THE ARMY ORGANISATION

302. Grāmāt bahiḥ samīpe tu sainikān dhārayet sadā
grāmyasainikayorna syāt uttamarnādharmarnatā.
303. Sainikārtham tu panyāni sainye sandhārayet prthak
naikatra vāsayet sainyam vatsaram tu kadācana.
304. Senāsahasram sajjam syāt kṣanāt samśāsayet tathā
samśāsayet svaniyamān sainikān aṣṭame dine. 610
305. Candatvam ātatāyitvam rājakārye vilambanam
anīstopekṣaṇam rājñah svadharmaparivarjanam,
306. Tyajantu sainikā nityam samlāpam apicāparaiḥ,
nrpājñayā vinā grāmam na viśeyuḥ kadācana. 615
307. Svādhikāriṇaśyāpi hyaparādham diśantu naḥ,
mitrabhāvena vartadhvam svāmikārye sadākhilaiḥ.

302. The king should always place the soldiers outside the village but near; between villagers and soldiers there should be no relation of creditor and debtor. Soldiers not to live in villages.
303. He should open separately bazars in the camp for the sake of the soldiers, and he should never let an army remain at one place a year. Bazaar.
304. A king should order that a troop of a thousand men be ready at a moment's notice, he should teach the soldiers his orders in eight days.
305. "Let the soldiers always avoid committing a rash act, a murderous assault, delay in the service of the king, overlooking what is disagreeable to the king, and neglect in the performance of their duties; General orders.
306. "Let them avoid having conversations with strangers; nor should they enter a village without the permission of the king.
307. "Let them communicate to us any mistake made by an officer or a man belonging to the rank and file; and may you always be while in the service of the king in a state of friendship with all.

308. Sujjvalānica rakṣantu śāstrāstravaśanāni ca
annam jalam prasthamātram pātram bahvannasādhakam.
309. Śāsanāt anyathā cārān vinesyāmi yamalāyam
bhedāyitā ripudhanam grhitvā darśayantu mām. 620
310. Sainikairabhyaset nityam vyūhāyanukrtim nrpāḥ
tathāyane'yane lakṣyam astrapātairbibhedayet.
311. Sāyam prātaḥ sainikānām kuryāt saṅgananam nrpāḥ
jātyakrtivayodeśagrāmavāsān vimrśya ca. 625
312. Kālam bhṛtyavadhim deyam dattam bhṛtyasya lekhaḥ
kati dattam hi bhṛtyebhyo vetane pāritosikam,
tat prāptipatram grhṇiyāt dadyāt vetanapatrakam.
313. Sainikāḥ śikṣitā ye ye teṣu pūrṇā bhṛtiḥ smṛtā
vyūhābhyāse niyuktā ye teṣvārdham bhṛtim āvāhet. 630

308. "Let them keep very clean the arms, projectile weapons and dress, the food, water, the vessel which holds a *prastha*-measure and in which much food can be prepared.
309. "I shall remove the soldiers who disobey these orders to the abode of Death. The soldiers disbanded for plunder should show me what booty they have taken from the enemy."
310. A king should always practise with his soldiers the manner of formations, and other military drills, and should likewise try every half year to pierce the target by discharging projectile weapons.
311. A king should every evening and morning muster his soldiers, having enquired into their caste, physique, age, country, village and station. Muster.
312. He should write down the time, the amount of pay, what pay has been given and is to be given, what present has been given to the soldier in his pay. He should take a receipt for it, and should give a pay-bill.
313. For the soldiers, who are disciplined, is mentioned full-pay; to those, who are undergoing instruction in military formations he should give half-pay.

314. Asatkartrāsritam sainyam nāśayet śatru-yogatah.
 315. Nṛpasyāsadguṇaratāh ke guṇadveśiṇo narah
 asadguṇodāśināh ke hanyāt tān vimrśan nṛpah,
 sukhāsaktān tyajet bhṛtyān guṇinopi nṛpah sadā.
 316. Susvāntalokaviśvastā yojyāh tvantahpurāḍiṣu
 dhāryāh susvāntaviśvastā dhanādivyayakarmani.
 317. Tathā hi lokaviśvastō bahyakṛtye niyujyate
 anyathā yojitāh te tu parivādāya kevalam.
 318. Śatrusambandhino ye ye bhinnā mantrigaṇādayah
 nṛpadurguṇato nityam hṛtamānagunādikāh,
 svakāryasādḥakā ye tu subhṛtyā poṣayet ca tān.

314. A king should destroy an army which is attached to an
 untrustworthy general, who is in collusion with the
 enemy.
 315. A king, remembering those persons, who rejoice in his
 faults and hate his virtues, or who are indifferent to
 his faults, should kill them; servants who are devoted
 to pleasure he should dismiss, even if they are other-
 wise good. Treatment
of ser-
vants.
 316. Well disposed and popular persons should be placed in
 his harem and elsewhere; well disposed and reliable
 persons should be employed in the distribution of
 money, &c. Appoint-
ments how
to be filled
 317. A person who has gained the confidence of the people
 should be likewise appointed to posts outside the palace,
 otherwise if incompetent persons were appointed, they
 would only bring on discredit.
 318. He should support with good pay the group of ministers
 and other officers, who will serve his interests, and who
 while actually in the service of the enemy are dis-
 affected, and who have lost their pride, virtue, and
 other good qualities through the badness of their king. Creating
dis-
sen-
sions in the
enemy's
camp.

319. Lobhenā'sevanāt bhinnāh teṣvvardham bhṛtim āvahet
 śatruṭyaktān suguṇinah subhṛtyā pālayet nṛpah.
 320. Pararāṣṭre hṛte dadyāt bhṛtim bhinnāvadhīm tathā
 dadyāt ardhām tasya putre striyai pādāmitam kila. 645
 321. Hṛtarājyasya putrāḍau sadguṇe pādasammitam
 dadyāt vā tadarājyastu dvātrīṣāṁśam prakalpayet.
 322. Hṛtarājyasya nicitam kośam bhāgārtham āharet.
 323. Kausidam vā taddhanasya pūrvoktārdham prakalpayet,
 taddhanam dviguṇam yāvat na tat tārḍhvam kadā- 650
 cana.
 324. Svamahatvadyotanārtham hṛtarājyān pradhārayet
 prānmanairyadi sadvṛttān durvṛttāstu prapīdayet.

319. The king should give half pay to those who are gone away
 (and have come back) from greed and disregard; he
 should provide excellent persons who have left the
 enemy, with good pay.
 320. If the kingdom of an enemy has been taken, he should
 give him pay from the time of the deposition; half the What to
give to
a van-
quished
king.
 amount he should give to the son, a quarter surely to
 the wife.
 321. He should give to the son or other relation of a dethroned
 prince, if he is very good, a fourth part of the income
 from the kingdom, or he may assign to him the thirty-
 second part of the kingdom.
 322. He should take for his own share the amassed treasure of
 the dethroned prince.
 323. Or he may fix on the dethroned prince the interest accruing
 from the treasure, i.e., the above mentioned portion ($\frac{1}{2}$),
 till the total sum (received by him) is double the
 amount of the treasure.
 324. He should maintain well the dethroned princes for the
 glory of his own greatness, if they are good with the
 honours formerly enjoyed by them; but if bad, he should
 suppress them.

325. Aṣṭadhā daśadhā vāpi kuryāt dvādaśadhāpi vā
yāmikartham ahorātram yāmikān vikṣya nānyathā.
326. Ādau prakalpitaṁ aṁśān bhajeyuryāmikāstathā
ādyah punastvantimāṁsam svapūrvāṁsam tato'pare.
327. Punarvā yojayet tadvat ādye'ntyam cāntime tatah
svapūrvāṁsam dvitiye'hni dvitiyādiḥ kramāgatam.
328. Caturbhyastvadhikān nityam yāmikān yojayet dine
yugapad yojayet dr̥ṣṭvā bahūn vā kāryagauravam.
329. Caturūnān yāmikānstu kadā naiva niyojayet.
330. Yadrakṣyam upadeśyam yat ādeśyam yāmikāya tat
tatsamākṣam hi sarvam syāt yāmiko'pica tat tathā.

325. For the sake of the watchmen he should divide night and Watch-
day into eight, ten or twelve watches, having previ- men.
ously looked at the (the number of the) watchmen, not
otherwise.
326. The watchmen will also share (amongst them all) the origi-
nally fixed watches; the first watchman will again take
the last watch, and each of the others will take the
watch of his predecessor.
327. Or he may also appoint as before the last watchman to the
first and last watch; the second watchman and the
others should in due order obtain on the second day,
&c. the watch of the first watchman.
328. He should always appoint every day more than four watch-
men, or on some occasions having seen that the work
is heavy, he should appoint many.
329. He should never appoint less than four watchmen.
330. The watchman should be told what is to be guarded,
and what is to be communicated; all should be before
his eyes, and the watchman should do it accordingly.

31. Kilakoṣṭe tu svarṇādi rakṣet niyamitāvadhi
3 svāṁśānte darśayet anyayāmikam tu yathārthakam. 665
2. Kṣaṇe kṣaṇe yāmikānām kāryam dūrāt subodhanam.
333. Satkṛtān niyamān sarvān yadā sampādayet nr̥paḥ
tadaiva nr̥patiḥ pūjyo bhavet sarveṣu nānyathā.
334. Yasyāsti niyatam karma niyataḥ sadgraho yadi
niyato'sadgrahatyāgo nr̥patvam so'snute ciram. 670
335. Yasyāniyamitam karma sādhutvam vacanam tvapi
sadaiva kuṭilāḥ syāt tu svapadāt drāk vinaśyati.
336. Nāpi vyāghragajāḥ śaktā mṛgāndram śāsītum yathā
na tathā mantriṇaḥ sarve nr̥pam svacchandagāminam.

331. He should up to the appointed time guard the gold and
other things in the bolted treasury, (and) at the end of
his watch he should show the amount of the treasure
to another watchman.
332. There should be kept continually from a distance a good
lookout on the watchmen.
333. If a king should succeed in having all his orders well Respect
executed, he will surely be honoured among all men, by a king. enjoyed
but not otherwise.
334. The king, who is steady at his work, shows kindness to
good people and discountenances bad persons, enjoys
his kingdom for a long time.
335. The king, who is unsteady in his work, good behaviour
and speech, and who is always deceitful, disappears soon
from his throne.
336. As tigers and elephants even are not able to govern the
lion, thus also all ministers are not able to govern a
king, who goes on as he likes.

337. Nibhṛtā dhikṛtāstena nissāratvam hi teṣvataḥ
gajo nibadhyate naiva tulabhārasahasrakaiḥ.
338. Uddhartum drāk gajāḥ śaktāḥ pañkalagnagajam bali,
nitibhṛṣṭanṛpaṃ tvanyanṛpa uddhāraṇakṣamāḥ.
339. Balavanṛpabhṛtye' lpe' pi śrīḥ tejo yathā bhavet
na tathā hinanṛpatau tanmantrīsvapi no tathā.
340. Bahūnām aikamatyam hi nṛpaterbalavattaram
bahusūtrakṛto rajjuh śinhādyaḥkarsanākṣamāḥ.
341. Hinarājyo ripubhṛtyo na sāinyam dhārayet bahu,
koṣavṛddhim sadā kuryāt svaputrādyaḥbhivṛddhaye.
342. Kṣudhayā nidrayā sarvam āśanam āyanam śubham
bhavet yathā tathā kuryāt anyathāśu daridrakṛt.

337. By the king are humbled and censured the ministers,
among them is therefore surely weakness ; an elephant
is not bound even by 1,000 loads of cotton.
338. A strong elephant is able to draw out quickly another
elephant who sticks in the mud ; a king is only able to
reform an iniquitous king.
339. Even if the servants of a mighty king are insignificant
there may be power and splendour ; but it will not be
the same with a weak king, even if his ministers are
not so.
340. The unanimity of many makes a king very strong ; a
rope made of many strings is able to drag a lion and
other beasts.
341. A king whose kingdom is reduced and who has become a A weak kingdom how to
dependent of his enemy should not maintain a large kingdom
army, he should always increase his treasure, for the strength
recovery of power by his son and descendants.
342. He should so work that through hunger and sleepiness
every kind of food and couch becomes agreeable,
otherwise he will soon become poor.

343. Dīśānaya vyayam kuryāt nṛpo nityam na cānyathā.
344. Dharmānītivihīnā ye durbalā api vai nṛpāḥ,
sudharmabalayugrājñā dandyaṣṭe cauravat sadā.
345. Sarvadharmāvanāt nicanṛpo'pi śreṣṭhatām iyāt
uttamo'pi nṛpo dharmanāśanāt nīcatām iyāt.
346. Dharmādharmapravṛttau tu nṛpa eva hi kāraṇam
sa hi śreṣṭhatamo loke nṛpatvam yaḥ samāpnuyāt.
347. Manvādyairādṛto yo'rthaḥ tadārtho Bhārgaveṇa vai,
dvāvirśātīśatam ślokā nītisāre prakīrtitāḥ.
348. Śukroktanītisāram yaḥ cintayet anīśam sadā
vyavahāradhūram vodhum sa śakto nṛpatirbhavet.
349. Na kaveḥ sadṛśī nītiḥ triṣu lokeṣu vidyate
kāvyaiḥ nītiranyā tu kunitirvyavahārinām.

343. A king should always spend in this manner, not otherwise.
344. Those kings who are surely deficient in righteousness and
good behaviour, and are also weak, should be punished
by a strong and righteous king, like thieves.
345. A lowbred king even may obtain excellence by the
protection of righteousness, while a king of the
highest caste may be ruined through the suppression
of righteousness.
346. A king is surely the cause for the prevalence of right and
wrong ; he who obtains kingship is surely the very
best in the world.
347. This matter concerning worldly prosperity which was
respected by Manu and others was also surely respected
by Bhārgava ; 2,200 double verses are told in his
essence of polity.
348. He who would always consider the essence of polity Excel-
lence of
Śukra's
polity.
spoken by Śukra, may become a king capable of bear-
ing the burden of administration.
349. Such a polity as that of the Poet (Śukra) is not known in
the three worlds. The Polity (propounded) by the
Poet is (good) polity, any other polity among men is
bad policy.

310 ON THE ARMY ORGANISATION OF THE ANCIENT HINDUS.

350. Nāśrayanti ca ye nītim mandabhāgyāstu te nrpāḥ, 700
 kātaryāt dhanalobbhāt vā syurvai narakabhājanāḥ.

350. Those unfortunate princes, who out of cowardice or
 cupidity do not have recourse to this polity, will surely
 have their share in Hell.

SCHEME OF TRANSLITERATION.

	Consonants.	Vowels.	Diphthongs.
Gutturals	.. k kh g gh ṅ ṇ ḥ ḥ	a ā	e ai
Palatals	.. c ch j jh ñ y ś	i ī	
Linguals	.. ṭ ṭh ḍ ḍh ṇ ṇ ṣ	r ṛ	
Dentals	.. t th d dh n l s	ḷ	
Labials	.. p ph b bh m v ḥ	u ū	o au
Anusvara	.. ṁ (real), ṁ (unreal); Avagraha		

APPENDIX.

IDENTIFICATION OF THE MANIPURA OF THE
MAHĀBHĀRATA WITH MANIPURA OR MANA-
LŪRU OR MADURA IN SOUTH INDIA.

On a previous occasion (pp. 232 and 233) we mentioned the city of Manipura as a place to which the Mahābhārata according to Mr. Talboys Wheeler ascribes fortifications provided with firearms.

This Manipura is declared by Mr. Wheeler to be the modern "Munnipur in the extreme east beyond the Bengal frontier . . . a secluded valley lying between Eastern Bengal and Burmah; and the people appear to be a genuine relic of the ancient Nāgas."¹⁹⁹

The late Professor Christian Lassen, by far the greatest authority on matters connected with Indian Archaeology, inclines to place it on the Eastern Coast of India south of Chicacole at the mouth of the *Lāṅgulya* river, identifying it with a locality he calls Manphur-Bunder.²⁰⁰

In order to fix the locality of Manipura it is necessary to follow Arjuna on his journey as described in the first book of the Mahābhārata.²⁰¹ Arjuna goes first to the North, reaches the Ganges, bathes in the holy river, and meets here the fair Ulūpi, with whom he stays for some time. He visits all the holy places in Aṅga, Vāṅga, and Kalinga. Pursuing his route to the South along the Mahendra mountains, he crosses Kāṅga, goes along the coast and reaches Manipura. Here

¹⁹⁹ See History of India, I, 144, 149, 421 and elsewhere.

²⁰⁰ See Indische Alterthumskunde, I, 676, 677, (583). 2nd Note "der Name scheint im Manphur-Bunder, erhalten zu sein, welches bei Cikakul nahe bei Koringapatam liegt."

²⁰¹ See Mahābhārata, Ādiparva, Chap. 174, 176; Bhāratacampū, III. *Śavaka*; Oriental Hist. MSS. Vol. I, 225, 226.

reigned the king Citravāhana, who had an only daughter Citrāṅgadā. Arjuna demanded her in marriage, after having made himself known. The king did not object to this request, but demanded that, as Citrāṅgadā was his only child, —for no Raja of Manipura had ever had or would have more than one child,—the son born to Arjuna by his daughter should become king of Manipura. To this Arjuna consented and a son, Babhruvāhana, was born to Citrāṅgadā, and after Arjuna had staid for three years in Manipura, he left it, turned towards the Western Coast, wandered along it to Gokarna, and finally met Kṛṣṇa at Dvārakā. In the horse sacrifice Arjuna came once more to Manipura, fought with, and was killed by, his son Babhruvāhana, but was revived through the life-restoring jewel.

Deciding on the evidence before us as taken from the Mahābhārata, Mr. Wheeler's identification of the ancient Manipura with the modern Munnipur falls to the ground, and with it all his explanations of the significance of this myth. That the stories concerning Arjuna's journey to Manipura should be known among the Munnipurees of our days, and that they should claim to be the descendants of the inhabitants of ancient Manipura²⁰² need not astonish anybody. By this time the contents of the Mahābhārata are pretty well known all over India and its bordering states, and the Munnipurees do not stand alone in arrogating to themselves historical fame by taking advantage of the resemblance of names. There exist in India many places called Manipura.

Equally wrong, though less objectionable, is the conjecture of Lassen. There does not exist near Chicacole a place called Manphur-Bunder. The name of the town he thought of is not Manphur-Bunder, but Mafūs-Bandar. It lies on the left bank of the Lāṅgulya river near the sea, and is a comparatively modern place, as its name, which is a mixture

²⁰² See History of India, I. p. 149.

of Arabic and Persian words, clearly indicates. Mafūs Bandar (మఘోసుబందరు) should be properly transcribed *Mahfūs Bandar* (محفوط بندر), which means a *secure harbour*, serving once probably Chicacole (*Śrīkākulam*) for such a purpose. Professor Lassen anxious to find a place on the north-eastern coast of the Dekkan which he could identify with Manipura, the capital of Babhruvāhana, fixed on Mafūs Bandar, mistaking *Mafūs* for *Manphur* (Manipura) most likely in consequence of a wrong application of the diacritical points over two letters. It may here be remarked that the originally Persian word *Bandar* is quite commonly used in Telugu, in the meaning of *harbour*, thus, e.g., Masulipatam is generally called Bandar. The reason of this fact is that the seafaring population are mostly Muhammedans, the Arabs being in former times great navigators in these parts of the world.²⁰³

I believe that Professor Lassen was to a great extent induced to fix Manipura so far north, by limiting too much the extent of the Mahendra-mountain range, which he opined to be a particular mountain situated in Kalinga, and starting from these premises he went so far as to declare that the country Kalinga was wrongly mentioned in the Mahābhārata, as the region which, together with Aṅga and Vāṅga, Arjuna has passed through on his journey. The name Mahendra can apply to all the mountains near the Eastern Coast, including the Eastern Ghāts as well as the mountains near the sea of Bengal in the utmost south. Indra is the regent of the East, and the whole Eastern Coast is under his protection; a mountain near Rajamandry in the north is called *Rājama-hēndra* and the highest and most southern mountain in India bears the name *Mahendragiri*.

In the Rāmāyaṇa Hanumān is said to have jumped from

²⁰³ North of Vizianagram lies inland a place called Munnipuripeta.

the Mahendra mountain to Ceylon (Lankā). This exploit would have been somewhat more difficult if Hanumān had to jump from Maṭṭabandar to that island; as he would have been obliged to leap into the dark, for he could hardly see Ceylon from a place near Chicacole²⁰⁴.

The mountain from which Hanumān is said to have jumped to Ceylon, bears to this day the name *Mahendragiri*. It is the same hill, near which the fierce warrior sage Paraśurāma lived. This Mahendragiri is the highest and most prominent peak north of Cape Comorin. It is 5,430 feet high and serves the sailors as a land mark; on its southern side lies the town Pannagudi.

On the east of the south part of the Eastern Ghāts, which is called there by the inhabitants also Mahendra, lies Madura, and a few miles still further east lies Maṇalūru. It may be here remarked, that Maṇalūru or Manipura lay formerly much nearer to the sea, as India has increased considerably on this side of the coast. In old legends we read, that the sea encroached on some occasions to the walls of Madura.

The Sanskrit name of this Maṇalūru is Manipura, and as such it was the capital of the ancient Pāṇḍya kingdom. Kulāśekhara Pāṇḍya is mentioned both in Tamil and Telugu records as the founder of Manipura, which was otherwise known by the name of Maṇalūru. The local traditions all coincide on this point. Manipura or Maṇalūru was the original site of the capital of the Pāṇḍya kings, which was afterwards transferred to Madura in its immediate neigh-

²⁰⁴ See Rāmāyana Kiṣkindhakaṇḍa, LXVII, 40—43.

40. Aruroha nagaśreṣṭham mahendram arimardanaḥ.

43. Vicāra hariśreṣṭho mahendrasamavikramaḥ.

Ibidem, Sundarakaṇḍa, I, 15, 213, 214.

Rāmāyanaśaṅgraha, Sundarakaṇḍa, I, 1.

1. Tato Mahendraśikharat utplutya Hanumān bali surasasinhike bhittva Lankābahiravātarat.

Mahānataka, Sundarakaṇḍa, I, 14, 15, 126, 127.

bourhood.²⁰⁵ In some chronicles Manipura is also called Kalyāṇapura; the proposed identification of Kalyāṇapura with Kurkhi is quite without foundation.

Occasional excavations round Maṇalūru have brought to light substantial evidences of ancient structures, especially in the fields of Maṇalūru Cintāmaṇi, midway between the present Maṇalūru and Madura; old coins and ancient gold ornaments have also been found there in quantities. The neighbouring country round Maṇalūru stands among the natives in the reputation of containing many hidden treasures, and people often try to find them by means of the wand.

It is a most important coincidence that in some old MSS. of the Mahābhārata, instead of the name Manipura, the chapters of the Aśvamedha, which should contain it, give actually the name Maṇalūru.²⁰⁶

In the "Oriental Historical Manuscripts" of the Rev. Mr. Taylor occurs, instead of Maṇalūru the name Manavūru, but from further evidence given by Mr. Taylor himself, both names apply to one and the same place.²⁰⁷ In some chronicles Madura is substituted for Manipura, and Arjuna is said to have married the daughter of the Pāṇḍya king of Madura.²⁰⁸

²⁰⁵ See Tamil Kadjaṇ MS. No. 2327 in the Government Orient. MSS. Library ibidem, Local Records XLVII, 105: "Madhurasamipamandunna Maṇipuram anaga Maṇalūru candravahsam Kulāśekharapāṇḍyuduḥ rajyapavipalana, saṁv. 4,100." According to some Kulāśekhara himself transferred the capital from Manipura to Madura.

²⁰⁶ See Aśvamedha, LXI, 1—3; LXVII, 1; LXVIII, 1; LXIX, 1.

LXI. 1. Krameṇa saha yastvevam vicaran Bharatarāṣabha

Maṇalūrupaterdeśam upāyat saha Pāṇḍavaiḥ.

2. Śrūtvā tu nṛpatirviram pitaram Babhruvāhanah

niryayau vinayenāryo brahmanārghyapurassarah.

3. Maṇalūreśvaram caivam upāyantam dhanāñjayaḥ.

LXVII. 1. Putrastasya mahabhāgo Maṇalūreśvaro yuvā.

LXVIII. 1. Prayopaviṣṭe nṛpatau Maṇalūreśvare tatha.

LXIX. 1. Kim agamanakṛtyam te Kauravyakulanandini

Maṇalūrupateṣṭasya tathaiva caranājire.

²⁰⁷ See Oriental Historical Manuscripts, by William Taylor, Missionary, I, 13, 57, 120.

²⁰⁸ See Ibidem, p. 122.

The adventures of Arjuna during his exile have always been a subject of great interest among the Indians, and many of his exploits have gained for him a favorite place among the Pāṇḍava heroes.

Especially his journey to Manipura has been largely commented upon, as through his stay at that place and his marriage with the crown-princess Citrāṅgadā, the family of the Pāṇḍyas became united with that of the Pāṇḍavas.

Citravāhana and his grandson Babhruvāhana are frequently mentioned as Pāṇḍyas as well in old as in more modern records, and on this point they are unanimous. Mr. Nelson, the able compiler of the Manual of the Madura District, is by far too positive, when he says that in the Mahābhārata no mention is made of Arjuna having married a Pāṇḍya princess; for there exist copies which contain such an account.²⁰⁹

The fame and power of the Pāṇḍavas must have spread all over India and beyond it, for the conqueror of Ceylon, Vijaya, belongs also to this family.

Whether the connection of the Pāṇḍyas with the Pāṇḍavas was a real one, or whether it was only assumed by the former to invest themselves with greater authority and to raise their position in the eyes of the people is now difficult to find out, but the belief in such connection is a matter of fact.

According to a chronicle quoted by Mr. Taylor the Pāṇḍya kings were descended from Yayāti, the son of Nahuṣa. Yayāti had two sons by Devayānī, the daughter of Uśanas, Yadu and Turvaśa (Turvasu). "The younger brother of Yadu (*i.e.*, Turvaśa,) was the first Pandian. The place of his reigning was Manalūr. Among those of this race, one, named Kuṣaseghara Pandian, by the favor of Śiva, cut down a forest of Kadambu trees, and built a town called Madura, where he lived."²¹⁰

²⁰⁹ See Manual of the Madura District, by J. H. Nelson, M.A., III, 49.
²¹⁰ See Oriental Historical Manuscripts, I, 120.

We thus see, if the legend just narrated rests on any authority, that Manipura or Manalūru through its king, who was a son of daughter of Śukra, is connected with Śukracārya,—the presumed author of the Śukraniti, and the expounder of the fabrication of gunpowder and the construction and handling of guns,—is the same Manipura, of which we have read in the Mahābhārata, that it was provided with firearms and guns against the attack of its enemies. If Manipura is the place which corresponds to the site of Manipura (Maṇalūru) near Madura, a great many otherwise inexplicable contradictions are easily solved.

The affection with which the Pāṇḍavas are remembered in India, and especially in the South, seems to me not only due to the interest which the story of their sufferings, their bravery, and final victory excited everywhere, but also to some cause by which their memory was effectually kept alive.

There are no monuments of great antiquity in Southern India, especially on the Eastern Coast, with which legendary lore does not somehow connect the name of the Pāṇḍavas. Thus we observe that their name is associated with the rock-cut caves in Māmaṇḍūr near Conjeveram, and the same occurs in many other places, perhaps also at the rock temples of Kalugumalai.

The famous Seven Pagodas near Madras, whose carvings are celebrated all over India, do not form an exception to this rule. The monoliths representing rathas (cars) or shrines named after Dharmarāja, Bhīma, Arjuna, Nakula and Sahadeva, and even to Draupadi, are among the most ancient of the carvings. Arjuna especially is a favorite; there are two rathas named after him, though one of them contains now an image of Gaṇeśa, and the most splendid carving, of which there exist also two copies, though one is in an incomplete state, is called Arjuna's penance. We must not forget that Arjuna is the presumed ancestor of the Pāṇḍyas.

I believe that these and other such carvings originated with the Pāndya princes, who, by honoring their ancestors, conferred still greater distinction on themselves. A reigning dynasty alone could have undertaken the construction of such works. The assumption that these carvings originated with the Pāndyas, under whose sway for some time the whole Eastern Coast remained, does not contradict any historical statement especially as the reign of the Pāndya kings extended over a long period.

The execution of these sculptures is generally ascribed to the architectural energy of Buddhists and Jains, but there is nothing against the assumption that the Pāndyas may have once also followed the religious tenets of the Buddhists and Jains and supported their co-religionists in the same manner in the South as the Maurya Kings of Pātaliputra did in the North.

If this hypothesis can be proved to rest on historical evidence, we shall perhaps be able to settle before long the date of the construction of these rock carvings in a more satisfactory manner than has been done up to this day.

GUSTAV OPPERT.

