

uneasiness is noticed. The animal retches off and on and a peculiar noise is produced. In some cases, simply a vague expression and slight change in behaviour are noticed for four or five or even more days and then sudden death with convulsions takes place.

Very rarely, the disease develops as a complication in another disease and that is generally distemper. The only explanation for such an occurrence is that the patient must be pre-infected and this disease coming up as a matter of loss of vitality or predisposition due to the original disease. We had one case with typical symptoms of distemper which was treated as an out-patient for some days. After some days' treatment, the patient showed symptoms of rabies and died; the brain was sent for microscopical examination and the case was confirmed as rabies. Temperature in almost all cases is elevated, in some cases upto 106° F. In some cases acute uneasiness is noticed and the animal does not rest in one position for even a few seconds. In such cases, death may take place within 24 hours.

In the case of dogs, males are affected more than the females—probably the former being fighters are liable to be exposed to infection.

Very small puppies, even two months old, are also affected. We have seen two cases of furious rabies in small pups.

In the case of cattle, it is observed that the disease comes up just after calving.

Also the place and depth of bite wound are points worth considering. The deeper the bite and the nearer to the brain, the greater the

possibility of developing the disease. We have seen cases bitten on the nose and head to develop the disease within 25 days from the date of bite. Superficial bites elsewhere on the body have remote chance of causing infection. Also the quantity of poison injected is a factor worth considering; but unfortunately, this cannot be estimated.

Before concluding, it would not be out of place to mention some diseases which show at times the same symptoms as that of rabies and are likely to be mistaken for rabies *prima facie*.

(1) Sticking of bone in the throat: dry retching, salivation and uneasiness. (2) Acute Rheumatism: uneasiness, peculiar gait and animal snapping on palpitation. (3) Advanced cases of canine typhus: mouth held open due to ulceration of buccal membrane, salivation and exhaustion. (4) Milk apoplexy: uneasiness, dullness, gasping due to high temperature and suddenness of attack. (5) Ordinary convulsions of epilepsy when the animal is brought to hospital in the last stage and without history. (6) Very severe form of skin diseases. Irritation of the skin produces sometimes the same train of symptoms. (7) Severe form of canker, making the dog uneasy and to run with the head held low and flapping of ears. Even salivation is seen. (8) Motor or Cycle accident cases with no fracture but simply a smash: their wavering gait, salivation and dullness. (9) Nervous form of distemper. (10) Dislocation or paralysis of the lower jaw. (11) Vicious temperament. (12) Phosphorus or strychnine poisoning.

Résumé on the Literature of Indian Medicinal Plants.

By K. Biswas, M.A.

(Royal Botanic Garden, Sibpur, Calcutta.)

FREQUENT demands for characterisation of medicinal plants, for furnishing accurate information as to their distribution and life-history and for the supply of authentic specimens of genuine medicinal value, have led the writer to prepare a treatise on medicinal plants which will be published in due course. Attempts have been made from a very early period—as early as the Vedic period—to supply a work of such vital importance. Indeed, the origin of botanical science may be traced to the investigation of the medicinal properties of plants. Search for the healing properties of plants to mitigate the misery of human beings caused by various ailments led to the serious study of the plants around them. Thus developed the science of Ayurveda which forms an important part of Atharva Veda—the most ancient and celebrated treatise on Hindu medicine, although, the use of some plants is mentioned earlier in Rig Veda.

The works of Agnivesha, one of the six distinguished pupils of Ayurveda, resulted in the compilation of *Charaka-Samhita* by Charaka. *Sushruta-Samhita* then emanated from the pen of Sushruta, one of the brilliant disciples of Dhanvantari, the surgeon of heaven who took his

birth in this country as Divadasa, King of Benares, who was reputed for his extraordinary knowledge in surgery and medicine. Thus *Charaka-* and *Sushruta-Samhitas* are the oldest treatises now extant and are of such great value to the Hindus that they are considered to be divine and beyond criticism. Among the contributions of this early period mention may be made of Baghatta's *Astanga-hridaya-Samhita*; *Chakradatta-Sangraha*; *Sarangadhara-Sangraha*; Vab Misra's *Vab Prokasa*; Madan Pal's *Raj Nighanta* and several other *Nighantas* and works on *Drabya Gunas* formed the basis of further studies on medicinal plants. Works of Makhzum-ul-Adwiya and other Hakims written in Persian and Urdu may be mentioned as valuable contributions to medical science in those old days by Mahommedans.

Foreign influence on the study of plants either for purely theoretical interest or for information on their medicinal values, dates back to the sixteenth century when Portuguese and Dutch scientists came to India. They may be considered as the pioneer workers in this field. Thomas Rives, Odrardo Verbosa, Christobal DaCosta are among those who took lively interest in the study of drugs. But along with these it

will be necessary to include Garcia da Orta, whose *Coloquios dos simplas e drogas Le cousos medicinais India*—was published at Gôa in April 1563 and was in fact the third book printed in India. Van Rheedes' *Hortus Malabaricus* is the monumental work of twelve volumes on the study of Indian plants in the 17th century from 1678 onwards to 1703. During the 18th and 19th centuries, valuable contributions based on researches carried out on more or less modern lines, were made by a band of highly trained workers which enabled the recent investigators to make sufficient headway in the study and investigation of medicinal plants of this country. The earliest work of the 18th century of sufficient value is that of Georgens Everhardus Rumphius' *Het Amboinsch Kruyd-Boek* (1750). It was actually written by Rumpf in the 17th century and the manuscript was left unpublished in the archives of the Dutch East India Company until Burman received permission to publish it. The name of William Roxburgh, "the father of Indian Botany"—the first Superintendent (1793–1813—whose book on Indian plants was actually published in 1820–1824 by Dr. Carey) of the then East India Company's garden—now, The Royal Botanic Garden, Calcutta, has become a household word in this country in recognition of his inimitable *Icones* and his *Flora Indica*. His works form the keystone for subsequent works on Indian plants. To confine ourselves mainly to the study of Indian medicinal plants—the names of the following workers may be mentioned: Dr. Fleming (1810), W. Ainslie, author of *Materia Medica of the Hindus* (1813) and its second edition—of 2 octavo volumes on *Materia Medica* (1825); Playfair (1833), Talif Sheriff, *Indian Materia Medica*, published in Calcutta, 18th to 19th century; Forbes Royle, *Vegetable Resources of India* (1839); and Sir William O. Shaughnessy of the Calcutta Medical College, who published in collaboration with Dr. Nathaniel Wallich—next successor to Roxburgh as the Superintendent, Royal Botanic Garden, Calcutta—his much reputed work entitled *The Bengal Dispensatory and Pharmacopœia* (1844). Shaughnessy's publication led to the recognition of the value of many of the Indian medicinal plants by foreigners. Next followed Dr. Edward Balfour's *Cyclopedia of India* (1855)—a supplement to which was published in 1862. In the same year G. C. Birdwood wrote an account of *Vegetable Products of Bombay. The Useful Plants of India* by Heber Drury of Madras Army (1858–1869); Dr. Stewart's *Punjab Plants* (1869); Atkinson's *Economic Products of North-Western Frontier Provinces*; Dr. George Bidie's *Cinchona Cultivation in India* (1878); U. C. Dutt's *Hindu Materia Medica* (1870) written with the valued assistance of George King, the then Superintendent of the Royal Botanic Garden, Calcutta; Kanny Lall Dey's *Indigenous Drugs of India* (1896) and the notable contribution of B. C. Gupta's *Vanaushadi Darpana*—the second edition of which appeared in 1917 (1324 B.S.), which

appeared at the end of 19th century, are valuable contributions during the 18th and 19th centuries. But this period cannot be passed without mentioning the publication of Dymock's *Vegetable Materia Medica of India* (1883) and particularly *Pharmacographia Indica* (1890–1893) prepared in collaboration with Warden and Hooper; and Sir George Watt's *Dictionary of the Economic Products of India* in 6 volumes (1889–1893)—Index volume of which appeared in 1896—are the two outstanding works containing valuable information. These works embody the results of the labours of the two well-known investigators of the latter part of the 19th century. Their contributions will prove invaluable for research workers in their further investigations in this field. In 1918 the voluminous works on medicinal plants by Kirthikar and Basu were published, wherein the authors have made a praiseworthy attempt to compile a detailed description of plants together with notes on their medicinal value. A revised edition of this work with considerable emendations and modifications is ready for publication. The illustrations accompanying the text are of considerable advantage for the identification of the plants. Apart from this work, *Indian Materia Medica* by K. M. Nardkarni—a revised edition of which appeared in 1926—deals exhaustively with the medicinal properties of plants. The botanical aspect of this book requires to be corrected and improved upon. Col. R. N. Chopra, in his book on *Indigenous Drugs of India* (1933) has furnished up-to-date information on the medicinal properties of plants. The botanical information on individual species might have been incorporated with advantage to render this work to be of more general and practical value. The need for bringing out suitable publications to remedy the deficiency of botanical information in treatises on medicinal plants will be appreciated. In the volume now under preparation, the family characters and specific descriptions are given; suitable illustrations and notes on distribution together with brief references to their medicinal properties have been incorporated. It is hoped that this hand-book may serve as a guide both to the professionals and to the amateurs in gathering authentic materials in the field and in identifying medicinal plants. Sir David Prain's *Bengal Plants* proved useful to the author in his work. For valuable suggestion and addition of specific descriptions of plants common to this Province—specific descriptions which fill a gap in such publications as *Bengal Plants*, as stated by Sir David himself—the author offers his grateful thanks to Sir David Prain, Lt.-Col., Kt., C.M.G., C.I.E., M.A., D.Sc., LL.D., F.R.S. I am indeed deeply indebted to Sir David Prain also for making necessary emendations in this contribution. My thanks are also due to Babu Ekkari Ghose, author of *Krisitawva* for his valuable assistance in the preparation of the book on medicinal plants.