

After discussing some of his own contributions to the subject, Dr. Chowdhuri refers to gum- and resin-yielding trees. Here the type of incision is of paramount importance.

In the absence of standardised methods, much waste and vital injuries are caused to the trees.

K. V. S.

THE VARIATION IN STATURE AND CEPHALIC INDEX AMONG BENGALIEE COLLEGE STUDENTS*

THE data embodied in the address were obtained from the routine health examinations of the students by the Medical Board attached to the Students' Welfare Committee of the Calcutta University during 1922-28. The anthropometric measurements were taken according to the Monaco Agreement and were arranged and tabulated in relation to each of the six traditional zones of the province of Bengal, viz., Radha, Varendra, Vanga, Chattala, Samatata and Calcutta, and five caste groups of peoples, viz., Brahmins, Vaidyas, Kayasthas, other Hindus and Moslems. The data reflect the conditions prevalent among the rich and middle classes.

The mean of the stature is fairly equally distributed over the whole province except for Calcutta. There is great resemblance between the first three zones. The last two zones are characterised by a tendency to tallness and roundheadedness.

* Extract of Presidential Address of Dr. A. Chatterji to the Anthropological Section, Indian Science Congress, Patna, 1948.

Further elucidation of the data is made on the basis of a classification of the individuals into nine types of correlation of stature (tall, medium and short) and Cephalic index (dolicho-, meso- and brachycephals), and the percentile incidence of the different types in the six zones is noted. Further group differences in the six different zones and the zonal fluctuations in the same group on the basis of caste are tabulated.

The fact that there is a great deal of ethnic unity and homogeneity is brought out by the following findings which emerge from the data.

The medium mesocephals and medium brachycephals constitute the most predominant type among the Brahmins and the Vaidyas. The medium mesocephals predominate among other Hindus and the Moslems. There is considerable variation in the Cephalic index among the Kayasthas. Dr. Chatterji, in conclusion, envisages the emergence of a united people with close cultural and linguistic bonds.

C. J. JAYADEV.

BLOOD-FLUKE PROBLEM IN INDIA*

COMPARED with any other single group of parasites, blood-flukes or schistosomes rank foremost in undermining the health of almost all domestic animals in India. It is a subject in which both Veterinary and Medical professions are interested alike. Dr. Bhalerao in his Presidential Address has given an idea of the work that has been done in India on these parasites and suggested measures for their control. Reference has also been made to cercarial dermatitis of man which so far as the research of the author has progressed appears to be localised only in certain localities in India.

As a result of the work of Montgomery (1906) and several other workers during the past three decades, seven authentically identified species of schistosomes have been recorded from India, viz., *Schistosoma hæmatobium*, *S. spindalis*, *S. nasalis*, *S. indicum*, *S. incognitum*, *Ornithobilharzia bomfordi* and *O. nairi*. Of these the first one has been sporadically recorded from man, while the remaining six have been known to parasitise only the domestic animals.

Montgomery first found *Schistosoma spindalis* in the mesenteric vessels of two plain cattle (*Bos indicus*) at Mukteswar and described the morphological features of the adult worm and

their spindle-shaped ova. Bhalerao (1932) discovered in cattle from Bihar another variety of *S. spindalis*, in which the males had a smooth cuticle, whereas the males described by Montgomery had a tuberculate cuticle. It has been observed that alimentary infection with *Schistosoma cercariæ* occurs only in ruminants owing to the peculiar anatomical and physiological differences in the stomach of these animals. *Schistosoma cercariæ* cannot survive the normal acidity of the gastric content in animals other than ruminants.

Fairly and collaborators developed in this country serological method of diagnosing bilharzia infection. As a result of numerous complement fixation tests it has been concluded that the cercarial antigen of *S. spindalis* is of a group nature and can be used successfully in detecting infestation by *S. hæmatobium*, *S. mansoni*, *S. japonicum*, *S. boris*, *S. spindalis* and *S. indicum*. Pleural peritoneal and pericardial transudates and exudates will yield positive complement fixation reaction in infected animals provided the blood shows similar reaction. Regarding the treatment, it has been found that tartar emetic is capable of curing *S. spindalis* infection in goats. The female worms are affected more by anthelmintics than by male ones. Intravenous injection of emetine hydrochloride has more efficient anthelmintic properties than tartar emetic, but is more toxic.

Unlike other species of *Schistosoma*, *S. nasalis* occurs exclusively in the nasal veins of the

* Summary of the Presidential Address delivered by Dr. G. D. Bhalerao before the Section of Medical and Veterinary Sciences, Indian Science Congress, Patna, 1948.

host. Usually cattle and rarely buffaloes are infected, but sporadic cases occur in goats. One case of equine infection was brought to the notice of the author. A thorough description of both the male and female parasite was first given by Bhalerao (1932). According to the available data the disease occurs in Bombay, Madras, Central Provinces, Bihar, Assam, Orissa, Mysore, Bengal and also in Burma. Antimony tartrate is the drug of choice for the treatment of this infestation.

Prior to 1932, *S. indicum* was known to occur only in the horse, donkey, sheep and camel, when Bhalerao (1932) recorded its presence in cattle and goats from various localities in India. Montgomery was the first to describe this species, later Bhalerao (1932) added materially to the original description of this parasite. The life-history of this important parasite still awaits elucidation.

Chandler (1926) recorded from the supposed human stool asymmetrical schistosome eggs with a subterminal spine, and assigned these ova to a new human species of schistosome—*Schistosoma incognitum*. In addition to porcupine hosts, *S. incognitum* parasitises dogs as well.

Ornithobilharzia bomfordi was found only once in a plain cattle at Mukteswar by Montgomery. Along with *S. spindalis*, Price (1929), assigned this species to the genus *Ornithobilharzia*, remarking that some birds must have been the definitive host of this species and that bovine infection was purely accidental.

Madaliar and Ramanujachari (1945) identified a species from the elephant and designated it *Schistosoma naini*. On account of the anatomical peculiarities of both the male and female worms, this species could not be retained in

the genus, schistosoma, and Bhalerao assigned it to *Ornithobilharzia* in 1947.

There are a few records in this country of indigenous human schistosomiasis. Mello (1936) quotes one definite case of urinary bilharziasis in a child who showed numerous ova of *S. hæmatobium* in urine and fæces. Recently Andreasen and Suri (1945) reported a case where large number of ova of *S. hæmatobium* were detected in urine.

From the scanty report, it would appear at the first sight that human bilharziasis is not a very serious condition in this country. It, however, transpires that some molluscs in this country are capable of harbouring the larval stages of the human schistosome, *S. hæmatobium*, and this fact offers a clue to explaining the sporadic occurrence of the cases of bilharziasis in this country. This need not, however, alarm us, for the clinical, epidemiological and experimental data, obtained so far, do not warrant the conclusion that urinary bilharziasis may become endemic in India.

Cort (1928) was the first to demonstrate that non-human schistosome cercari produces the "swimmer's itch". Bhalerao recently encountered similar conditions in men bathing in some tanks in the Mysore State. Examination of the snails from the tank revealed the presence of two species of cercariæ.

Bhalerao concludes by saying that schistosomiasis, particularly in domestic animals is a very serious condition and causes considerable monetary loss to the stock-owner in this country. Strenuous efforts should, therefore, be made to control this condition. Such measures will not only eliminate schistosomiasis but will also exterminate other fluke diseases, both of men and animals existing in this country.

N. N. DE.

BETA-RAY COUNTERS

R. S. KRISHNAN

(Department of Physics, Indian Institute of Science, Bangalore)

I. INTRODUCTION

IONISATION chambers and Geiger counters are very frequently used for detecting and measuring the radiations emitted by artificial radio-active bodies. Although ionisation chambers are easily made they are not suitable for measuring very weak β or γ -rays, since a limit to the measurement of very weak radiations is set by the background ionisation or rather by its statistical fluctuations. For reliable measurements with ionisation chambers and electroscopes, the source should be much stronger than that required for measurements with counters. Moreover, ionisation chambers are not useful for studying nuclear isomerism and K-capture by the coincidence method, whereas Geiger counters are indispensable for such studies. Much work has been done and many papers have been published on the construction and performance of Geiger counters. But often contradictory views have been expressed by workers in different laboratories. In connection with the investigations on the deuterium-induced disintegrations in the heavy elements,

the author studied in some detail the methods of construction and behaviour of counters suitable for measuring β -ray activities of radioactive products. The results of these studies which were carried out in the Cavendish Laboratory at Cambridge (which are not at all outmoded now) are presented in this article.

2. THE MECHANISM OF EXTINCTION IN COUNTERS

The counter is essentially an ionisation chamber in which the intensity of the electric field is such that a discharge does not set in spontaneously but is started by the ionisation produced by the incoming particles. The discharge thus produced is not allowed to become permanent, but is interrupted automatically after a very short time in order that the apparatus may be reset in a proper condition for registering the next particle. The point and the tube counters work on the same principle, although the tube counter is more sensitive than the point counter. The sensitivity of the counter is not very much influenced by the energy of the particles counted.