



FIG. 2

4. The twinned grains clearly indicate stress or strain directed at certain portions and the crystals are not disturbed all along their projected continuation.
5. The gross outer form of the individual grains or the aggregates of twinned crystals also reveal the secondary nature of the pyroxene twinning.

Secondary twinning includes three types, viz. :

- (a) Glide twins and
- (b) Transformation twins of Buerger (1945)<sup>2</sup> and
- (c) "Synneusis" or combination twins Ross (1957).<sup>3</sup>

The third type is much less widely appreciated and is not reported in pyroxene in the literature accessible to the authors; but this genetic type is clearly revealed and prominently displayed by the pyroxene twins in the middle parts of the dyke under study. In the thin sections examined the separate twinned grains are rare or absent. Invariably they occur in glomeroporphyratic clusters with individual twinned grains being in parallel, sub-parallel or random orientation. It appears that twinning behaviour, crystal habit and the nature of the crystal boundaries are affected differently by crystallisation of pyroxene in an essentially solid medium. The occurrence of pyroxene twins in clusters in progressively increasing number away from the contact of the dolerite towards its middle portions suggests that the pyroxene crystals in a solid state have undergone drifting together in an essentially fluid medium of the dolerite magma and combination of crystals to form twins.

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## HUMAN SCHISTOSOMIASIS IN INDIA: DISCOVERY OF AN ENDEMIC FOCUS IN THE MADRAS STATE

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**WORKERS** in the field of parasitology had constantly kept in mind the possibility of the introduction of human schistosomiasis in India by Indian troops and travellers returning, after the first world war, from endemic areas. Sewell<sup>1</sup> observed that the snails belonging to the genus *Bulinus* and *Physopsis*, which were the usual vectors of this disease, did not occur in India. Hence it had been held that human schistosomiasis had no chance of being established in India. But authentic cases of this disease had been reported from time to time from widely scattered localities from Punjab, Poona, Bombay, Goa and Madras.<sup>2-5</sup> However, no endemic focus was discovered from India until recently when Gadgil and Shah<sup>5</sup> reported, for the first time, an endemic focus

from Bombay State. Now we have discovered an endemic focus from Madras State.

The endemic focus discovered by us is situated in a village called Tirupparankundram in Madurai District. The village has a population of about 3,000. The drinking water supply is from wells. Besides there is a large tank by name *Saravanappoigai*. The people of the village use the tank for washing after defecation and even discharge urine in it. They use the same water for washing clothes and bathing, thus affording ideal conditions for the spread of schistosomiasis which is a water-borne disease.

About 30% of the people of all ages, both males and females, of this village are suffering from urinary schistosomiasis. Hematuria with

or without typhoid fever is the symptom of the disease. Every sample of urine passed by the patients contained blood. The number of ova and eggs in their urine was so large that even uncentrifuged urine showed a fair number under the microscope. The eggs were oval with terminal spine (Fig. 1 A), resembling those of *Schistosoma hematobium*.<sup>6</sup>

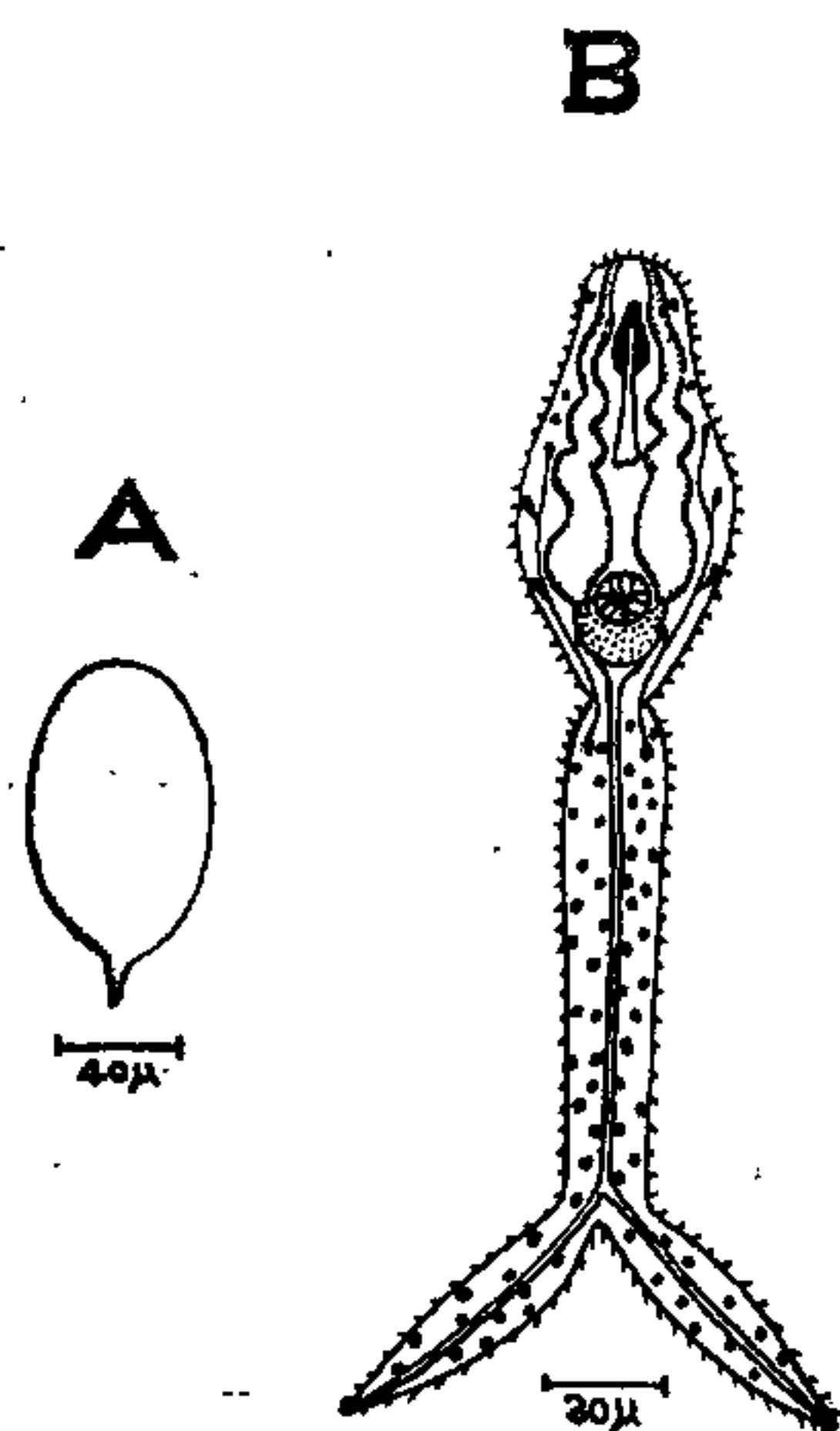


FIG. 1. Egg and Cercaria of the Schistosome from Tirupparankundram. A: Egg; B: Cercaria,

Having thus established the presence of human urinary schistosomiasis, we turned our attention to the search of intermediate molluscan host. There are large number of snails in the tank referred to above. The snails are found submerged under water on the stones

in the tank. A large number of snails were collected and dissected in the search for the larval stages of the schistosome. Of the 200 snails dissected, we found 90 were infected. The cercariæ discovered (Fig. 1 B) resembled those of *S. hematobium*. The infection rate in the snails is 45%.

The snails belong to the species *Vivipara heliciformis* (family Viviparidæ) as the shell is conical, scarcely umbilicate, solid, smooth, polished and pale-olive green in colour; the number of whorls 6; the aperture is oval, somewhat angled above and interior of shell bluish-white in colour.<sup>7</sup>

It is suggested that detailed snail surveys in the areas from which stray cases of human schistosomiasis have been reported, may reveal some more foci of infection, and such discoveries will be of immense importance from the point of view of public health.

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## RESPONSE TO SELECTION FOR WIDE ADAPTATION IN BREAD WHEAT

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**C**ONFLICTING views have been expressed by various workers regarding the efficiency of selection under optimal and suboptimal conditions (Falconer,<sup>1</sup> 1960; Robertson *et al.*,<sup>4</sup> 1960; James,<sup>3</sup> 1961; Frey,<sup>2</sup> 1964). One of the drawbacks of selection under rainfed condition (low fertility) is the presence of high genotype-environment interactions preventing the identification of superior genotypes. Since germination and plant stands are poor under extreme moisture stress, maintenance of large segregating populations is a problem, while screening of genotypes is easy under favourable conditions for plant growth such as high fertility and optimum moisture.

Therefore, the efficiency and advance under selection in three diverse environments has been investigated in the present study to verify whether selection in favourable environments for some developmental features influencing yield will be useful in evolving lines with wide adaptation. The material consisted of the  $F_2$ 's of a set of 17 crosses of wheat in a partial diallel involving 14 Indian and three exotics, genetically diverse elite parents. The same  $F_2$  populations were grown under three different environments, *viz.*, high fertility (120 lbs. N/acre + irrigation (Irrigated), moderate (60 lbs. N/acre + irrigation) and low (20 lbs. N/acre under rainfed condition) in 1965-66.