

## RESEARCH NEWS

is its prohibitory cost. As competition between the manufacturers increases and as technology advances, hopefully there will be solutions that would help overcome this barrier. Meanwhile, with the booming entry into the era of genomics, gene profiling microarrays will continue to provide us novel clues to cancer diagnosis and treatment.

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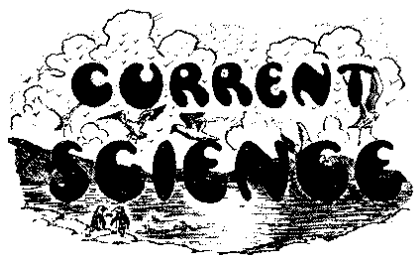
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## FROM THE ARCHIVES



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### Educational reform

According to the Press report published recently the Government of India is contemplating the appointment of a special committee to suggest reforms in the present educational syllabuses and methods, as a sequel to the report of the Sapru Unemployment Committee. The special committee is proposed to be assisted in its deliberations by two or more British experts on technological education. In the meantime the Central Government is considering the report of the Sapru Committee with a view to discover the extent and direction of the application of its proposals for relieving unemployment, in the light of the opinions received from the provinces. The main conclusion of the Sapru Commit-

tee is that the problem of unemployment will ultimately be solved by the institution of more technical schools, and by the improvement and adaptation of the existing system of education to the needs of a growing community. The Committee has also suggested measures of reform in the conditions of service with reference to wastage and recruitment. The general aspects of unemployment have been discussed by a number of special committees, the legislative bodies and the leaders of public opinion, who have expounded the causes and remedies of such unemployment. The announcement in the Press that a new committee is speedily to be appointed might lead to the impression that Government is not already surfeited with documents, and it is almost certain that this new committee, however much it may be strengthened by the British experts, is not going to be the last. The problem of unemployment is far too complicated in India to invoke the aid of educational reform alone to provide remedies.

The present system of education is not, as is commonly and frequently criticised, rooted in the life of the people. Its purpose is not relevant to their needs. It is the creation of Government

to suit the special needs of administration. It supports their interests and embodies their prejudices. It brings a foreign culture imposed upon the genius of the people from above by the ruling people who think that they know what is good for the country. The country suspects the motive behind it all. These criticisms are as familiar to us as the things by which we are surrounded from childhood. The people are undoubtedly keen for education, if it is good for something, but they are naturally indifferent to what is offered to them in the name of education leading their children nowhere. Education is mixed up with a multitude of other extraneous things, which have nothing to do with it, and of which people do not approve, – institutions and interests which in a very subtle but powerful way it bolsters up and perpetuates. They agree with everything we might tell them about the need and urgency of education, but the actual system and the purpose of education now in practice they distrust. This feeling which is undoubtedly widespread explains the prevailing indifference of the working classes to education. The reform of education must attack this indifference; it can do so only by making the schools so effi-

cient and popular that children will cheerfully and of their own accord come to them, and will not willingly leave them. It is through children that education hopes to reach the parents and society, and it must be remembered that every child who leaves the school unwillingly is a missionary for education, and everyone who leaves it in a contrary

frame of mind is a dangerous force on the other side.

We cannot enter here into all the general and special aspects of educational reform, but can only indicate its general principles and the future policy of its control and management. If we think of education in all its bearings and its nature, as lifelong, as interpenetrating all

occupations, as teaching every man and woman of doing their work in a better and more intelligent way, as co-extensive with the entire field of social activities, then education should be autonomous in its own territory. This reform being effected, all else will follow.

## SCIENTIFIC CORRESPONDENCE

### Use of the fungus *Beauveria bassiana* (Bals.) Vuill (Moniliales: Deuteromycetes) for controlling termites

Entomopathogenic fungi such as *Beauveria bassiana* (Bals.) Vuill (Order Moniliales: Deuteromycetes) have the potentiality to infect insects, resulting in their mortality. It is a beneficial fungus infecting a wide range of insects of the order Lepidoptera, Coleoptera and Hymenoptera, most of which are agricultural pests. The biocontrol potentiality of this fungus has been exploited, making use of the local isolates collected from either soil or from dead insect hosts prevailing in different geographic areas. Control of termites using entomopathogenic fungi has been documented earlier<sup>1-3</sup>. *Metarhizium anisopliae* conidia have been formulated and the product named 'BioBlast'<sup>4</sup> has been used to control termites. The mode of treatment of the pest was in the form of fungal baits<sup>5</sup> or pure cultures of the entomopathogen<sup>6</sup>. Workers of the termite colony were targeted more than the soldiers<sup>5</sup>. Dry conidial sprays or mixing the entomopathogen in the soil at  $10^8$  conidia g<sup>-1</sup> of soil can be used to control termites for up to a period of 3 months to 3 years under cool, dry, humid conditions<sup>7</sup>; with 100% mortality after 10 days of application in the field and 48 h after application in the laboratory<sup>8</sup>.

Most of the work on termites has been done using laboratory bioassays, by disturbing the termites from their natural environment and allowing them to crawl/feed on baits containing the entomopathogen<sup>9</sup>. Direct field trials by treating the colonies in their natural

environment are meagre. Evaluation of relative pathogenicity of the fungal isolates by classical bioassays is beset with problems, in view of the difficulty to rear on artificial diet and through movement of the termites after application of the inoculum deep into the soil and into the surrounding areas. Collection of data on mortality from different mounds also become unrealistic in view of inadequacy of information on the pest load before treatment, due to their confinement to mounds. In the present study, an attempt has been made to overcome these problems by selecting the uplifted mounds of termites so as to cause least disturbance to their natural habitat and at the same time facilitating collection of mortality data after treatment with local isolates of *B. bassiana*. The ultimate objective of the study is to select a virulent isolate of *B. bassiana* for deployment in the development of eco-friendly bioinsecticide for termite control.

Six strains of *B. bassiana* isolated from the dead insect larvae collected from the farmers' fields of Andhra Pradesh were maintained as pure cultures on Sabarauds dextrose yeast agar medium. The fungus was mass multiplied on sorghum, bran and husk for a period of 10–15 days for treating the mounds containing white ants.

The intact mounds were collected by using flat crowbars from underneath and brought in intact condition to the laboratory. They were maintained in proper humid conditions by keeping

them in plastic trays of 12 cm depth throughout the experimental period. Treatment with the fungal isolates was conducted by thoroughly sprinkling the mass multiplied inoculum on the mounds along with the natural medium, which promoted growth of the fungus. Mortality was recorded from the second day onwards and the data for workers and soldiers were separately noted. The dead termites were removed everyday and kept in humid chambers for overgrowth of the fungus on the cadavers. Later, these were surface sterilized and the fungus was reisolated from the dead termites. Six isolates of *B. bassiana* were used for understanding relative pathogenicity against termite populations (Table 1). The mounds serving as controls were treated with only the natural medium used for mass multiplying the fungus. The mass-multiplied inoculum along with the natural medium was mixed with 1% sucrose and placed around the mound in the tray for serving as diet. Three replicates were maintained for each isolate along with the control sets.

Effect of the biocontrol agent studied in terms of mortality recorded from the second day onwards indicated that the worker community of the termites was more susceptible. Some of the dead insects were collected everyday and kept in humid chambers for fungal overgrowth on the surface of the insects. Prior to death, the insects showed symptoms of fungal infection in the form of sluggishness. The isolates 4–23