the parasites were as a rule much less abundant than those from Nellore District. I may also mention that these parasites are not found in *Ariophanta bistralis* (Beck.).

Bhatia[3] states that the family Urceolariidæ, to which *Trichodina* belongs, has not been recorded so far from India. But Dr. H. S. Rao[4] in his paper on a Brackish-water Actinian, *Pelocoetes* from Madras mentioned the occurrence of *Trochodina* sp. in large numbers in the gastrovascular cavity and often swarming in the cavities of the tentacles.

It is, however, very interesting that species of *Trichodina* should occur in a land animal like *Ariophanta ligulata*. *Trichodina pediculus*, the best known species of *Trichodina* occurs on the body surface of *Hydra*. *Trichodina urinicola* has been found in the urinary bladder of a moribund toad and also in the newt *Triturus*, in the same site. Other species of *Trichodina* have been collected from bodies and gills of fish. Discussing the life-histories of ciliate parasites, Goodrich[5] states: "Fulton suggested that *Trichodina urinicola* may have evolved from forms like *Trichodina pediculus* infesting fish-like ancestors; the ciliates leaving the gills and body surface for the bladder as or before the host left the water". But this theory will not explain the origin of a species of *Trichodina* inhabiting the reproductive system of a land Pulmonate like *Ariophanta ligulata*.

In conclusion I have pleasure in expressing my thanks to Prof. R. V. Seshaiya for guidance and encouragement and to Dr. H. S. Rao for pointing out that a species of *Trichodina* was recorded by him.

Zoology Department,
Annamalai University,
Annamalainagar, P. N. RAJAKRISHNA MENON.
March 30, 1944.

1. Dasen, D. D., *Proc. Zool. Soc. London*, 1933, **103**, 97. 2. James-Clark, H., *Ann. and Mag. Nat. Hist.*, 1866, **17**, 401–25. 3. Bhatia, B. L., "Fauna of British India," *Protozoa: Ciliophora*, 1936, 395. 4. Rao, H. Srinivasa, *Journ. and Proc. As. Soc. Bengal* (n.s.), 1924, **20**, 344. 5. Goodrich, H. Pixell, 'Life-Cycles of Certain Infusoria with Observations on Specificity in Parasitic Protoza.' in *Evolution* (edited by DeBeer, G. R.), 1938, pp. 231–34.

BURNT PADDY-HUSK FOR THE CONTROL OF INSECTS IN STORED FOOD GRAINS

RECENT investigations by Briscoe,[1] Parkin[2] and others have shown that certain kinds of finely-ground dusts of natural minerals like Flint, Felspar, Silica, Dolomite and Limonite and flue dusts from power stations and blast furnaces and power-station Clinker, act as very efficient checks against weevils infesting wheat when the dusts are mixed intimately with the grain.

Observations made by the senior author, of the methods of storing grains, followed in the interior villages of the Malnad areas, led to an investigation of the efficacy of burnt paddy husk in the control of insects affecting different grains. It was found that burnt paddy husk, in finely powdered form (100-mesh to the inch), when thoroughly mixed with jola, rice, wheat and horse-gram at the rate of 1 per cent. of the weight of the grains, adhered to them exceedingly well and caused a high percentage of mortality of the insects. In a series of experiments, in Petri dishes, jars and gunny bags (holding one seer of grain) the following rates of mortality were observed:—

Grain	Insect	Average percentage of mortality
1. Jola ..	Weevil: *Calandra oryzæ*	86·3
2. Rice)	Beetle:	
3. Wheat) ..	(*a*) *Rhizopertha dominica*	100·0
	(*b*, *Tribolium* sps.	68·4
4. Horsegram	Beetle: *Bruchus chinensis*	100·0

The larval stages of *Tribolium* and *Bruchus* beetles in their tunnels inside the grains, have also been found to be affected. Sound grains (free of insects) mixed with burnt paddy husk powder, also repelled the insects to a marked degree.

The removal of the powder from the grains offered no special difficulty, since, ordinary winnowing and sieving and the usual cleaning or moistening with water prior to cooking for consumption, are found sufficient to render the grains free of the powder.

As paddy husk is commonly available everywhere, its use makes the problem of control of insects affecting stored-grains very easy, cheap and simple. The chances of 'silicosis' in the use of this powder, are very much less than in the case of the powders of pure minerals and 'clinker'.

Further work on a large scale is in progress. Fine powders of burnt husk of other cereals and some pulses are also being tested.

Department of Agriculture,
Bangalore, M. J. NARASIMHAN.
June 14, 1944. B. KRISHNA MURTHY.

1. Briscoe, H. A. V., "Some New Properties of Inorganic Dusts," *J. Roy. Soc. Arts*, **91**, (4650). 2. Parkin, E. A., "Control of the Granary Weevil with Finely Ground Mineral Dusts," *Ann. Appl. Biol.*, March 1944, **3**, No. 1.

RELIEF FOR SCIENCE TEACHERS

THE appalling position of science teachers, particularly of those serving in non-Government institutions, whose emoluments even during peace-time were hardly adequate for their sustenance, has been brought home through an ever-increasing number of letters which reach me daily from all parts of India.

A large majority of them are ill-paid and do not receive even the meagre "Dearness Allowance" to which their less unfortunate brethren in Government employ are entitled. Their position which has always been acute, has become distressing since the beginning of 1943 due to racketeering in prices of foodstuffs and rents and the picture of pauperism aggravated by extortionate merchants and landlords, presented in these letters, has impelled me to come out into the open and appeal to the philanthropic public to come to their relief.

The position of the school teachers is rendered lamentable in view of the circumstance that no organization exists in this country to bring their case to the attention of the public. The tragedy is that nobody thinks of them; nobody knows that they need help. What is in fact, a front line tragedy, remains scandalously neglected, even unnoticed. The need for bringing them succour is no less urgent, no less pressing, than, for instance, for the working journalists; but there is no organization like the All-India Newspaper Editors' Conference, to espouse their cause.

Humanitarian considerations demand that the lot of the school teachers should be alleviated. Teaching is one of the most ancient and noblest professions and the teacher fulfils a very important and vital role in the body politic. During the war years, the teachers, particularly the science teachers, have trained a large number of students to man the fighting services, the ordnance factories and industrial establishments. Is it too much to hope that in this country, where charity to the deserving is enjoined on every citizen as a religious duty, the industrialists and philanthropic trusts would come forward for relieving the suffering of the teachers, who are on the brink of destitution?

I am enclosing herewith a representative letter* which I have received from one of my old pupils, Mr. Dhirendra Mohan Mukherji, which will lend support to what I have expressed in the letter. I hope you will give your closest attention to this question and see if a plan could be evolved to give some relief to the poor science teachers.

Office of the Council of Scientific
and Industrial Research,
Delhi, S. S. BHATNAGAR.
June 1, 1944.

---

* Extracts from the letter referred to above.

"I DO not know whether you are aware of the fact that for more than a year and a half the teachers of non-Government colleges in Bengal are engaged in a mute struggle to save their prestige as teachers. For obvious reasons they cannot go about stating their adverse conditions and begging for private or public help. If some of them have received any dearness allowance it is so meagre and so disproportionate with the manifold rise in the price of essential commodities that they are finding it increasingly difficult to maintain themselves and their families on their petty pre-war salaries.

The Government of Bengal have not found it possible to help in any way the teachers of non-Government colleges. The political organizations have not extended their help to those poor educators of young minds.

Apart from any humanitarian considerations these teachers, especially those of scientific subjects, have a right to live in British India because they are steadily supplying a good number of workers for the ordnance factories and other industrial organizations directly connected with the war effort.

The day is fast approaching when most of these science teachers will have to face starvation. Would it not be a matter of disgrace on the part of the renowned Indian Scientists if they fail to move in an attempt to bring relief to these honest teachers?"

CYCLEWELDING—A NEW BONDING PROCESS

PERFECTION of a new process, called "Cycleweld adhesive process", that will stick structural parts more firmly together than they can now be riveted or spot-welded, represents the successful culmination of a joint venture of two United States firms, the Goodyear Company and the Chrysler Motors Corporation. It is expected to speed up production as well as to simplify the manufacture of structural parts. While its present application is expected to be chiefly in the aviation field, many post-war uses are anticipated for it.

The Cycleweld adhesive process has two types of application. One is to bond vulcanised or synthetic rubber to metals or plastics. The other is to bond metal to metal, wood or plastics. It is the bonding of metal to metal that is most important at the moment. In both cases, the process is essentially the same and depends upon the use of newly developed cements, the composition of which is being kept secret for the time being. The proper cement is applied to the surfaces to be bonded together and "cured" in a suitable furnace under considerable heat and pressure. In the case of the metal to metal bond, the cement has been developed into the form of a film or tape. It is merely necessary to place this tape between the parts to be bonded together and then apply heat and pressure. The process of bonding metal to metal lends itself particularly to the bonding of light sheet alloy parts such as aircraft parts made from aluminium or magnesium alloys.

In comparison with riveting and spot-welding, cyclewelding shows both superior strength under static load and in resistance to vibrational stresses. In every use of cyclewelding, whether metal is being bonded to metal, or synthetic rubber to plastic, the result is a bond stronger than the materials bonded together. Post-war uses foreseen for the Cycleweld adhesive process include the making of composite articles of metals and plastics and the sheeting of wood with thin corrosion-resistant metals for the manufacture of automobile bodies, furniture, houses, etc.