some cercariæ. A typical schistosome dermatitis followed exposure to these cercariæ.

An examination of 100 *Siphonaria* from part of a rock platform at Cape Banks, Sydney, showed an infection-rate of 35 per cent. At low tide this area is often crowded with the gull *Larus novae-hollandiae*.

Twenty-five budgerigars (*Melopsittacus undulatus*) were exposed to naturally emerged cercariæ, or cercariæ from crushed snails. Immature schistosome worms were recovered from the liver or lungs of five birds. The worms appear to belong to the sub-family Bilharziellinae.

It is interesting to note that the host snail, *Siphonaria*, belongs to a pulmonate family (the Siphonariidae). Members of this family bear a superficial resemblance to limpets, but may be distinguished from them by a groove which runs down inside the right-hand side of the shell. Members of the Siphonariidae are normally found in the upper littoral zone of rocky shores. Their distribution is almost world wide, but they are especially common around the shores of the Pacific and Indian Oceans[2].

Because the Siphonariidae have such a wide geographical distribution, and their normal habitat is often the resting place of birds of the seashore, one might expect them to be the hosts of larval schistosomes in many other places.

The assistance of Mr. A. J. Bearup is gratefully acknowledged.

Wm. H. Ewers

School of Biological Sciences,
University of New South Wales,
Sydney.

[1] Bearup, A. J., *Med. J. Austral.*, **1**, 955 (1955).
[2] Hubendick, B., *Zool. Bidr. Uppsala*, **24** (1945).

Transmission of Gall-Diseases of Cacao, Mango, and Pigeon Pea

'Cushion-gall' disease of cacao is widely distributed throughout South America[1] and has been reported also from Ghana[2] and Nigeria and Ceylon[3]. The disease has been found in most old cacao plantings in British Guiana, in the 'green-point' form, and was recorded and described by A. W. Bartlett[4] as long ago as 1905, although his report was only rediscovered in 1959. The presence of the 'flowery' type has yet to be confirmed.

Hutchins[2] has transmitted the disease successfully in Costa Rica by tissue implantation, while workers in Ghana (Tinsley, T. W., personal communication, November 1959) have transmitted a similar disease using the single cotyledon technique.

In the present work the 'green-point' type gall of cacao was transmitted by using the half-bean technique: galls were produced three weeks to a month after inoculation. Washings from the surface of galls, or extracts of macerated gall tissue transmitted at a rate of 1/7. The germination-rate of half-beans treated with gall inoculum was markedly lower than that of controls treated with distilled water.

Galls similar to the 'green-point' form of cacao have been found on mango and pigeon pea. Distilled water washings, and extracts of gall tissue of these species were inoculated into cacao half-beans. Galls were visible in the axils of the cotyledons about one month after inoculation.

The transmission-rates were:

	Washings		Tissue extract	
Mango	13/35	16/25	15/35	17/25
Pigeon pea	7/25		9/25	

The galls produced by inoculation from mango material were indistinguishable from those produced by inoculations from cacao 'green-point' material. While most of the galls produced on plants inoculated with pigeon pea gall were similar to cacao-gall, in some, the axillary bud enlarged very considerably and became chlorotic, with no proliferation of other buds. The germination-rate of the treated plants was comparable with those of controls with distilled water.

Transmission of the mango gall into a two-month cacao seedling was also obtained by inoculation of the axillary bud with tissue extract.

In the absence of any knowledge of vectors of 'cushion-gall' of cacao the significance of these results is difficult to assess. However, the ease with which the diseases of mango and pigeon pea can be transmitted to cacao under laboratory conditions would suggest that the cultivation of these two species in close proximity to cacao should be avoided.

This communication is published by permission of Bookers Sugar Estates, Ltd.

J. F. Archibald

Bookers Sugar Estates, Ltd.,
Georgetown,
British Guiana.

[1] Hutchins, L. M., *Seventh Inter-American Cacao Conference, Palmira* (1958).
[2] Hutchins, L. M., *Rep. No. 66, Inter-American Institute of Agricultural Sciences* (1959).
[3] Orellana, R. G., *F.A.O. Plant Protection Bull.*, **7**, No. 4 (1959).
[4] Bartlett, A. W., *Official Gaz. British Guiana*, 232 (July 29, 1905).

Puccinia polysora on *Tripsacum laxum* and *Zea mays*

There would appear to be the impression that, in the Carribbean, the same strain of *Puccinia polysora* attacks both *Tripsacum laxum* (Guatemala grass) and *Zea mays*. In Trinidad during 1953–54 an attempt to cross-inoculate uredospores from the two species proved completely unsuccessful. Successful inoculation of the same species was a matter of routine. It was not possible to detect any morphological differences between the strains, but they are certainly quite distinct. *T. laxum* is at present free from attack by *P. polysora* in Eastern Nigeria.

P. Tuley

Agricultural Research Section,
Umadike,
Umuahia-Ibeku,
Eastern Nigeria.

MICROBIOLOGY

Slime-wall Formation in the *Salmonellae*

The formation of a 'slime wall', which is usually a property of *Salmonella paratyphi B* but not of *S. paratyphi B* var. *java*, has long been used as a criterion of differentiation between these two organisms[1–4]. According to Birch-Hirschfeld[5], the slime-wall consists of a nitrogen-free polysaccharide containing more than 40 per cent of glucose. It is formed on solid media, optimally at temperatures of about 20–25° C. and not at 37° C. In this laboratory it is regularly demonstrated by incubating platings on solid media, initially at 37° C. overnight, and afterwards at 21° C. The slime-wall is usually evident after 24 hr. at 21° C. In the search for a reliable medium on which to demonstrate its formation, it was found that the