

of *Trichuris trichiura* infection in hospitals for the mentally subnormal in the U.K. and reported the successful treatment of patients with difetarzone. This note describes the location of the major source of infective eggs of this parasite in one of the hospitals surveyed, Cell Barnes Hospital, St. Albans, and reports the activity of chloropicrin against the eggs.

In a search for the source of infection, the only site within the buildings where fully embryonated eggs were encountered was in the laundry, at a point between the intake of dirty linen and the first wash. However, it was thought unlikely that these numbers of eggs were responsible for the heavy infections seen in some wards. Eggs were also found elsewhere throughout the buildings, but none showed signs of development to the infective stage.

Small soil samples of 1 or 2 g were taken from the play areas of two heavily infested wards, nos. 18 and 1, but no eggs were found. However, because infection with *T. trichiura* via the soil has been accepted for many years as the mode of transmission in the tropics, it was decided to investigate further the possibility that soil from the playgrounds could be the source of infective ova. A 25-lb (11.3-kg) sample of top soil was taken from the play areas of ward 18 and ward 1 and the eggs extracted by a semi-mechanical sieving and sedimentation technique described by Beer¹. In the sample from ward 18, where the parasite has been known to be present for a number of years, approximately 10,000 fully infective eggs of *T. trichiura* were recovered. In the sample from ward 1, into which infested patients were moved only one year ago, 2,000 fully infective eggs were recovered. In a follow-up examination in which 1-in (2.5-cm) layers were taken from an area approximately 8 in (20.3 cm) square, down to a depth of 12 in (30.5 cm) in ward 18 and 15 in (38.1 cm) in ward 1, infective eggs were randomly distributed in each of the layers. In ward 18, 100-2,000 eggs were found per layer and in ward 1, 25-500 eggs were found per layer.

As pica is commonly practised by sub-normal patients and has been frequently observed at Cell Barnes Hospital, it would appear that infection with *T. trichiura* is principally via the soil. Development of these eggs to the infective stage in soil would be a comparatively slow process in the U.K., where the mean ambient temperature is lower than 20°C, as ova require more than 120 days at 15°C and up to 57 days at 20°C before becoming infective.²

As far as could be determined from a search of the literature, there appeared to be no compound that was effective against ova of *T. trichiura*. The compound chloropicrin (trichloronitromethane) is used commercially on a contract basis for the treatment of soil nematodes and seemed worthy of evaluation in the laboratory. The large numbers of *T. trichiura* eggs required for this work were not readily available, so we used the more easily obtainable ova of the very closely related species, *T. suis* of the pig³. Eggs of *T. suis* in lots of 10,000 were exposed to serial ten-fold dilutions of chloropicrin in water for 24 hours, washed thoroughly, and incubated at 30°C for five days. In repeated experiments 1/1,000 dilutions completely inhibited embryonation, while 1/10,000 was without effect. A similar experiment was undertaken using eggs which had been incubated previously for 14 days, and again a 1/1,000 dilution arrested development of the larvae.

The evidence suggests that chloropicrin should be evaluated for sterilization of the soil in the areas responsible for reinfesting patients. It is known that the eggs of *T. trichiura* can survive for many years in the soil, and failure to sterilize the soil will result in repeated reinfections over long periods. Treatment of soil should therefore be under-

taken at the same time as treatment of the patients.—We are, etc.,

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- 1 Beer, R. J. S., *Parasitology*, 1972, **65**, 343.
- 2 Dinnik, J. A., and Dinnik, N. N., *Meditsinskaya Parazitologiya i Parazitarnye Bolezni*, 1937, **6**, 603.
- 3 Beer, R. J. S., Ph.D. Thesis, University of London, 1972.

Gram-negative Bacilli on Hands

SIR,—In their interesting report on the skin bacteria of hospital staff (9 June, p. 580) Drs. Johan N. Bruun and Claus O. Solberg conclude that "Gram-negative bacilli should be regarded as frequent members of the resident flora" and that the incidence of "hand-carriage" of such bacilli is increased by the use of hexachlorophane soap. The data presented do not, however, support these conclusions.

Though "coliforms" and other Gram-negative bacilli were isolated from the washed hands of 110 out of 624 staff members, only eight of these consistently yielded Gram-negative bacilli over a period of several months. These "persistent carriers" yielded identical strains throughout this period in only six cases, and five of these individuals actually had clinical paronychia and chronic "skin irritation."

The colonization of skin by Gram-negative bacilli is rare except in areas that are already diseased or damaged.^{1,2} In contrast to true carriage, the hands of members of staff frequently yield large numbers of Gram-negative bacilli which are repeatedly acquired from the hospital environment.³ Drs. Bruun and Solberg have previously shown that the regular use of hexachlorophane preparations is far more effective at preventing the transient contamination of skin by hospital strains of *Staphylococcus aureus* than by Gram-negative bacilli.⁴ They have not however shown that Gram-negative bacilli are permanent members of the flora of healthy skin.—I am, etc.,

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- 1 Selwyn, S., and Chalmers, D., *British Journal of Dermatology*, 1965, **77**, 349.
- 2 Selwyn, S., and Ellis, H., *British Medical Journal*, 1972, **1**, 136.
- 3 Selwyn, S., *Journal of Hygiene*, 1965, **63**, 59.
- 4 Bruun, J. N., Boe, J., and Solberg, C. O., *Acta Medica Scandinavica*, 1968, **184**, 417.

Hepatitis-associated Antigen in Chronic Hepatitis

SIR,—We have previously shown a clear difference in the incidence of hepatitis-associated antigen (H.A.A.), as determined

Disease	No. of cases tested	No. H.A.A.-positive	
		C.F.	R.I.A.
Chronic aggressive hepatitis	42	31 (73.8%)	33 (78.6%)
Chronic persistent hepatitis	24	3 (12.5%)	6 (25.0%)

by complement fixation, between chronic persistent and aggressive hepatitis.¹ These findings could be explained either on the basis of an aetiological difference between the two forms or because of failure of the technique employed to demonstrate the antigen in all of the cases.

Since then we have studied 66 cases of biopsy-proved chronic hepatitis by both complement fixation (C.F.) and radioimmunoassay (R.I.A.). The latter method gave positive results for H.A.A. in five cases which had been negative by complement fixation. Moreover, we were able to confirm our previous findings of a sharp difference in the incidence of H.A.A. in the two forms of hepatitis (classified according to De Groot *et al.*)² (see table).

Therefore it is likely that, in a region like ours (Campania, South Italy) in which there is a high incidence of H.A.A. in chronic liver diseases,³ chronic aggressive hepatitis is in the vast majority of cases related to virus B, which seems to be associated with only a limited number of cases of chronic persistent hepatitis.—We are, etc.,

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- 1 Carrella, M., del Vecchio-Blanco, C., and Coltorti, M., *British Medical Journal*, 1972, **2**, 169.
- 2 De Groot, J., *et al.*, *Lancet*, 1968, **2**, 626.
- 3 Del Vecchio-Blanco, C., Carrella, M., and Coltorti, M., *Acta Hepato-Gastroenterologica*, 1973, **20**, 138.

Androgens and Exercise

SIR,—Dr. J. R. Sutton and others have reported (3 March, p. 520) significant increases in serum androgens in response to maximal exercise in athletes and normal male students. We have recently obtained results on serum androgens in immobilized patients which may illustrate the converse effect.

During investigation of a new radioimmunoassay kit for serum androgens (Sorin, Italy) a series of determinations were conducted on serum specimens surplus to requirements for requested biochemical tests on male inpatients, together with serum from healthy male volunteers. Our results are shown in the table.

Group	No. Tested	Serum Androgen Concentration (ng/ml)	
		Mean	Range
Healthy men	4	4.4	3.6-5.0
Ambulant male patients ..	4	5.5	2.8-9.4
Immobilized male patients	15	0.6	0.2-1.5

Serum androgen levels in the normal men and in the ambulant male patients were all within previously reported normal ranges,¹ but were markedly depressed in immobilized, severely ill male patients. The mechanism of