

(BRIEGEL, 1980) and *Glossina* (BURSELL, 1970), which acts as an antioxidant (GLAVIND & SØNDERGAARD, 1964; AMES *et al.*, 1981). The traces of haem in serum, perhaps abetted by traces of haem in the inoculum, should then suffice to satisfy this still absolute but now minute requirement. Presumably, application of the findings to culture media will narrow the gap between *in vivo* and *in vitro* growth, and help satisfy curiosity as to whether nature can outzany the art of the synthetic organic chemist in promoting Fe utilization by haemoflagellates.

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#### References

- Ames, B. N., Cathcart, R., Schweirs, E. & Hochstein, P. (1981). Uric acid provides an antioxidant defense in humans against oxidant- and radical- caused aging and cancer: A hypothesis. *Proceedings of the National Academy of Arts and Sciences, U.S.A.* **78**, 6858-6862.
- Baker, J. R. (1984). Haem and haemoflagellates. *Transactions of the Royal Society of Tropical Medicine and Hygiene*, **78**, 142.
- Briegel, H. (1980). Determination of uric acid and haematin in a single sample of excreta from blood-fed insects. *Experientia*, **36**, 1428.
- Bursell, E. (1970). Feeding, digestion and excretion. In: *The African Trypanosomiasis Part II: The Insect Vectors*. The genus *Glossina*. Mulligan, H. W. & Potts, W. H. (Editors). London: Allen and Unwin; New York: Wiley-Interscience, pp. 305-316.
- Glavind, J. & Søndergaard, E. (1964). Studies on the effects of the nutrition on antioxidant levels of the body. I. Tissue antioxidants in chicks on an encephalomalacia-producing diet. *Acta Chimica Scandinavica*, **18**, 2173-2178.
- Mather, J. P. (1982). Ceruloplasmin, a copper-transport protein, can act as a growth promoter for some cell lines in serum free medium. *In Vitro* **18**, 990-996.
- Pickart, L. & Thaler, M. M. (1980). Growth-modulating tripeptide (glycylhistidyllysine): association with iron in plasma and stimulation of adhesiveness and growth of hepatoma cells in culture by tripeptide-metal ion complexes. *Journal of Cellular Physiology*, **102**, 129-139.
- Rockwell, G. A., Sato, G. H. & McClure, D. B. (1980). The growth requirements of SV40 virus transformed Balb/c-3T3 cells in serum-free monolayer culture. *Journal of Cellular Physiology*, **103**, 323-331.
- Shapiro, A., Hutner, S. H., Katz, L. & Bacchi, C. J. (1981). Rapid *in vitro* prescreen for chelators as potential trypanocides based on growth of *Crithidia fasciculata*. *Journal of Protozoology*, **28**, 370-377.
- Yoshida, T. & Kikuchi, G. (1978). Features of the reaction of heme degradation catalyzed by the reconstituted microsomal heme oxygenase system. *Journal of Biological Chemistry*, **253**, 4230-4231.

patients who are infected with *S. haematobium* and we have taken the position that schistosomiasis is more of a risk to the pregnancy than the potential risks of metrifonate. The manufacturer's literature suggests that metrifonate is not known to be embryotoxic (Bayer) although metrifonate has been shown to have mutagenic activity in *Salmonella typhimurium* (BATZINGER & BUEDING, 1977).

We would like to describe here a patient treated with metrifonate during the first trimester who delivered a baby with multiple deformities:

The patient came to the hospital complaining of infertility. She was not detected to be pregnant. *S. haematobium* eggs were found in the urine so she was treated with 450 mg of metrifonate. She had a repeat dose of 450 mg three weeks later. She presented for her first prenatal visit six months later and was noted to be in her 8th month. She went to term and was unable to deliver vaginally so underwent a Caesarian section. The term infant had massive hydrocephalus requiring a craniotomy to deliver through a "T" incision. The baby also had a large meningeomyelocele and died an hour after delivery.

This mother was treated twice with metrifonate during the second month of pregnancy. A cause and effect relationship cannot be established with this single case but it suggests that caution should be used when using metrifonate in pregnancy. Praziquantel 40 mg/kg is very useful in the treatment of schistosomiasis but we reserve it only for *S. mansoni* because of its cost. In a review of praziquantel, PEARSON & GUERRANT (1983) quote numerous studies that failed to show any mutagenic activity. If other cases of deformities are noted in the future and metrifonate proves to be dangerous during pregnancy, then praziquantel may be a better choice for the treatment of *S. haematobium* in pregnancy.

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#### References

- Pearson, R. D. & Guerrant, R. L. (1983). Praziquantel: a major advance in anthelmintic therapy. *Annals of Internal Medicine*, **99**, 195-198.
- Batzinger, R. P. & Bueding, E. (1977). Mutagenic activities *in vitro* and *in vivo* of five antischistosomal compounds. *Journal of Pharmacology and Experimental Therapy*, **200**, 1-9.

*Accepted for publication 30th April, 1984.*

*Accepted for publication 14th April, 1984.*

#### Metrifonate in pregnancy

In tropical countries the issue of which parasites to treat during pregnancy is an enigma. *Schistosoma haematobium* is hyperendemic in our area and we use metrifonate 10 mg/kg to treat patients with this parasite. We are frequently faced with pregnant

*Biomphalaria pfeifferi* in Eastern Senegal Region,  
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We encountered *Biomphalaria pfeifferi* (Mollusca: Pulmonata) in February, 1984, during the course of a trip to the south-eastern corner of the Republic of Senegal. The site was a roadside pool that represented a water remnant (during an unusually dry year) in the

bed of the Koo-kono River at its junction with the National Highway. The Koo-kono River is a tributary of the Gambia River. The location was 12.9 km north-west of Kédougou. The pool measured approximately 8 by 20 m and up to 3 m in depth. One end supported a healthy growth of water-lilies (*Nymphaea* sp.) and hornwort (*Ceratophyllum* sp.). In addition to the *B. pfeifferi*, other snails collected included *Bulinus* (*Ph.*) *globosus* and numerous large specimens of *Lymnaea natalensis*, the latter being also represented by extensive egg masses on the underside of the lily pads. Similar ponds probably occur in the same geographical area, but have not been located.

No cercariae emerged from the *Biomphalaria*, when isolated in vials with water, but a xiphidiocercaria, possibly of a plagioid, emerged from *Bulinus globosus*. *L. natalensis* were not studied for shedding of cercariae.

Schistosomiasis *mansoni* has been reported in schoolchildren of Kédougou (13/70 or 18.6%) as well as the Salemata area (4/31 or 12.9%) in eastern Senegal (LARIVIERE *et al.*, 1964), but to our knowledge the transmitting snails, *Biomphalaria pfeifferi*, have never been recorded from this region although they have been found in the neighbouring basin of the Casamance River, Senegal (SMITHERS, 1956).

It is quite possible that the relative scarcity of *B. pfeifferi* in eastern Senegal is a consequence of the high temperatures and its inability to withstand the severe annual quasi-drought conditions imposed by Sahelian weather patterns. It is speculated that such conditions might be altered in favour of the snails with the advent of major water resource development projects in this area.

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#### References

- Lariviere, M., Diallo, S. & Ranque, P. (1964). Existence de foyers de bilharziose à *S. mansoni* en Haute Casamance et dans le Sénégal Oriental. *Bulletin de la Société Médicale d'Afrique Noire de Langue Française*, 9, 288-289.
- Smithers, S. R. (1956). On the ecology of schistosome vectors in the Gambia, with evidence of their role in transmission. *Transactions of the Royal Society of Tropical Medicine and Hygiene*, 50, 354-365.

dom even though they are found commonly in immigrants from the tropics. In 1983 two nematodes were referred to me which were subsequently identified as adult *A. lumbricoides*. The first case concerned a young boy from the Portsmouth area who vomited a mature *A. lumbricoides* male and the second case involved a 10-year-old boy from Trowbridge, Wilts., who passed a large female *A. lumbricoides per rectum* in the W.C. Both patients were treated with mebendazole but there was no report of further *Ascaris* being passed.

Three possibilities must be considered as to how British children become infected with *Ascaris*. Firstly, they may acquire the infection overseas. However, neither of the patients reported above had travelled outside the UK so that this possibility can be dismissed for them. However, in general terms infection with *Ascaris* must be a considerable risk for those who travel in tropical regions. Secondly, infection could be derived from a resident, presumably an immigrant infected in his country of origin or a temporary visitor from an endemic area.

Obviously as Portsmouth is a major commercial port there is the possibility for wide contact with people from areas endemic for *A. lumbricoides* and the town also has a large immigrant population. On the other hand Trowbridge has a very low immigrant population and children there cannot be expected to have much contact with persons from endemic areas overseas. Both Portsmouth and Trowbridge have good sewage disposal systems so that *Ascaris* ova should be destroyed during the fermentation process. However, if young children are infected one can not be sure that hygienic practices are followed when they are not closely supervised but even this seems unlikely with the Trowbridge case.

There must be a very good case for careful surveying of the general population and especially immigrant communities for *Ascaris* (and also *Trichuris trichiura*) and for the chemotherapeutic elimination of these parasites, not only for the basic health of the immigrants but also to prevent the possibility of infection spreading to the indigenous population. *Ascaris* infections in pregnant women from endemic areas is one of the most common helminthological problems referred to this department. A survey of children born in the UK of immigrant parents would be illuminating.

The third possibility is that infective ova were imported on fresh vegetables or fruit. It would be a brave man who would hypothesize as to which material could be responsible for this but it is more likely to be something eaten raw and often unwashed. It must be recognized that even in areas where *Ascaris* is not normally endemic immigrant labour is often used as farm help so that almost any country could be held suspect. When this note was being drafted a survey of local vegetable markets showed Egyptian potatoes covered in earth and later Cypriot potatoes.

I do not think that one can decide which of these latter two possibilities accounts for the infections reported above but both possible sources of infection have serious implications.

I would be interested to hear whether others have had recent experience with *Ascaris* infections of indigents in non-tropical areas so that one could

Accepted for publication 11th May, 1984.

#### *Ascaris lumbricoides* in English schoolchildren

*Ascaris lumbricoides* infections are not thought to be endemic amongst persons born in the United King-