and antibody responses. The lack of specificity in the IgE response in the Marakissa study may have been due to the lower level of antigenic challenge in infected individuals. These observations support the view that the elevation of IgE antibody levels reflects exposure to infection and may have limited anti-fecundity role.

**Haptoglobin in children in adjacent malaria meso- endemic and non-endemic villages in Ampãap State, Brazil**

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A study of the relations between haptoglobinemia and malaria was carried out on 100 children aged 2–14 years from the Serra do Navio region, Ampãap State, Brazil including Serra do Navio, Colonia Aguã Branca, Porto Tereza, Arrependido and an indigenous group. Their serum haptoglobin levels were measured by a radial immunodiffusion assay. The mean haptoglobin level in Serra do Navio and Porto Tereza, which are non-malarial and hypo-endemic areas for malaria, respectively, was similar (normal level) while for the other areas, all meso-endemic areas for malaria, it was lower. There was a higher correlation (P<0.001) between haptoglobinemia and current malaria than between haptoglobinemia and a history of past malaria (P<0.01). This work was supported by the UNDP/World Bank/WHO Special Programme for Research and Training in Tropical Diseases (grant no. 870284), ICOMI, and Instituto Evandro Chagas-FNS.

**Malaria endemicity in the Serra do Navio region of Ampãap State, Brazil**

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To determine the malaria endemicity in 4 adjacent villages of Serra do Navio region (Serra do Navio, Colonia Aguã Branca, Porto Tereza, and Arrependido), Ampãap State, Brazil, we carried out a blood film survey and measured the spleen of individuals aged 2–9 years. Based on these observations, Serra do Navio village (prevalence and spleen rate = 0) was classified as non-endemic for malaria, Porto Tereza (prevalence = 1% and spleen rate = 7%) as hypo-endemic, and the other 2 villages, Colonia Aguã Branca (prevalence = 21% and spleen rate = 18%) and Arrependido (prevalence = 17% and spleen rate = 11%) as meso-endemic areas for malaria. Reasons for the difference in endemicity in these villages in the same area were discussed.

This work was supported by the UNDP/World Bank/WHO Special Programme for Research and Training in Tropical Diseases (grant no. 870284), ICOMI, and Instituto Evandro Chagas-FNS.

**Anopheles infected with human Plasmodium in the Serra do Navio region of Ampãap State, Brazil**

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An epidemiological study to determine the distribution of anopheline species and their potentiality as vectors of malaria was carried out in 4 villages of the Serra do Navio region, Ampãap State in the north of Brazil. Fifteen anopheline species were identified among 305 mosquitoes collected as human biting catches in the 4 study areas from February 1990 to October 1991. 77.2% of the mosquitoes were collected during the dry season. ELISA, based on the use of species-specific anti-sporozoite monoclonal antibodies, was used to analyse mosquitoes collected for human Plasmodium species. The positivity rate of the mosquitoes of all 15 species tested was 0-799% (23/2876): 15 Anopheles albifarisis, 4 An. nunezovari, and one each of An. brasilienensis, An. triannulatus, An. ostoldii, and An. rangeli. Plasmodium falciparum sporozoite antigen was detected in An. albifarisis and An. ostoldii; P. reuxi and P. reuxi variant VK247 were detected in An. albifarisis and An. nunezovari; and P. malariae in An. albifarisis, An. nunezovari, An. brasilienensis, An. triannulatus and An. rangeli. All mosquitoes positive for P. malariae were collected in the forest adjacent to the study areas (i.e., they may have been infected with P. vivax/ \textit{falciparum} from non-human primates).

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**A Schistosoma mansoni esterase implicated in the immune dependence of chemotherapy**

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[No abstract submitted.]

[This presentation was awarded a prize as the best poster at the meeting.]

**Poliomyelitis in Punjab, India: role of unnecessary intramuscular injections**

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This report represents the results of experience at the Oberoi Hospital, Jallandhar in Punjab during October to December 1991 conducted whilst on a student elective. Fifty patients with poliomyelitis-induced paralysis (28 male, 22 female) under 5 years of age were examined. 76% of children who acquired infection had completed a 3 dose course of orally-administered live attenuated vaccine. 64% had been injected intramuscularly by either local doctors or unqualified practitioners for a variety of febrile illnesses within 14 d or less of patients developing poliomyelitis. Invariably, the paralysed limbs were those injected, mostly the lower limbs following gluteal injections.

Our results indicate that the administration of 3 doses of oral polio vaccine, which is manufactured in Bombay and transported to Punjab, is often ineffective, perhaps because of inadequate maintenance of the 'cold chain'. Efforts must therefore be directed towards improving vaccination strategies, including giving further doses of vaccine, as has been shown to be successful in South India. Although details of intramuscular injections rely on parental recall, the high incidence of paralysis preceded by intramuscular injections emphasizes the importance of directing the attention of local practitioners to the risks of unnecessary intramuscular injections in polio endemic areas.

[See WYATT, H. V. et al., 1992: Transactions of the Royal Society of Tropical Medicine and Hygiene, 86, 546–549.—Editor.]