of response were dose-dependent, however, so that rate studies at a given time as a function of dose proved to be meaningless. Since SLPP has a long physiological half-life in the serum of male toads (*5*), meaningful dose-response data could be obtained nevertheless after a sufficient time lapse by determination of serum phosphoprotein levels.

On the basis of studies of the chicken (*7–9*), SLPP probably represents several yolk proteins complexed together in a manner not yet understood. One of the components that can be derived from the complex is the yolk protein phosvitin (*9, 10*), and it has been shown in both the chicken (*11*) and *X. laevis* (*12*) that the liver is the site of synthesis of phosvitin found in the serum of estrogen-treated males or vitellogenic females.

These preliminary results indicate that male *X. laevis* are excellent animals with which to study the production of a given protein as a response to administration of a hormone. Since there are many steps between the synthesis of SLPP and its appearance in the circulation, however, other approaches will be needed for examination of the mechanisms involved in the hepatic response to estrogens.

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Amoebic Meningoencephalitis: Sixteen Fatalities

Abstract. *The parasitologic examination of pathologic brain tissue from 16 cases of acute purulent meningoencephalitis occurring between 1962 and 1965 in northern Bohemia disclosed massive infection of the central nervous system by amoebas of the limax type. The common source was an indoor swimming pool.*

Within 4 years between 1962 and 1965, 16 otherwise healthy persons between 8 and 25 years of age died in a district in northern Bohemia, showing the symptoms of peracute purulent meningitis. The disease occurred in small outbreaks during the summer and autumn and completely resisted sulfonamide and antibiotics. As a rule death came 2 to 7 days after the onset of illness, which was manifested mainly by severe headaches. Epidemiologic investigations revealed that the only possible source of the infectious agent was a modern indoor swimming pool in which the water was kept at about 24°C. The deceased all bathed in this pool and the average time between exposure and onset of illness was 7 days.

The clinical picture of the disease, results of the clinical and laboratory tests, and pathologic and anatomic findings supported the theory of a bacterial etiology. Attempts to isolate a bacterial agent by culture *intra vitam* were unsuccessful. Postmortem examination absolved the three most probable agents: meningococcus, pneumococcus, and hemophilus; the true etiologic agent remained unknown.

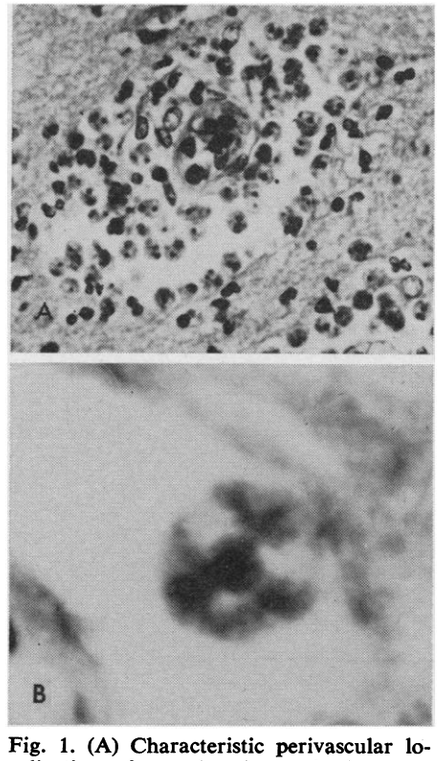

Fig. 1. (A) Characteristic perivascular localization of amoebas in cerebral cortex; trichrom stain. (B) Detail of an amoeba; typical morphology; trichrom stain. The average diameter of each is about 8 μ.

At the end of 1967 we obtained the histologic materials from the deceased for parasitologic examination. In all brain tissues we identified large numbers of amoebas (Fig. 1) which in morphology very closely resembled the organisms described as *Acanthamoeba* or *Hartmannella* in the eight cases of amoebic meningoencephalitis found in Australia and the United States (*1*). In dimensions the amoebas in our histologic preparations were much smaller than the formerly known pathogenic strains of *Acanthamoeba (Hartmannella) castellanii* (*2*). The exact taxonomic position of this meningoencephalitis-causing amoeba remains unclear because it could not be isolated in culture. The number of amoebas, their localization in tissue, the extent of lesions, and the cellular reaction provoked by the presence of parasites prove the decisive role of amoebas in the development of illness and in death.

These cases of amoebic (limax type) meningoencephalitis are the first reported from Europe and are the first having a common source of infection. The fact that an indoor swimming pool was identified as the source of the infectious agent is very important; the possible risk of more-frequent occurrence of brain amebiasis is demonstrated. A more detailed report will follow.

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