International Committee on Nomenclature of Bacteria Subcommittee on the Genus *Toxoplasma*

Minutes of Meeting, 7 July 1969

Leningrad, USSR

Minute 1. *Call to order.* An informal meeting of the subcommittee was called to order by the chairman, J. Chr. Siim, on the evening of 7 July 1969.

Minute 2. *Record of attendance.* Members present were P. C. C. Garnham, J. Chr. Siim, and D. N. Zasukhin. In addition, nearly 30 members of the IIIrd International Congress for Protozoology also attended.

Minute 3. *Taxonomy.* The chairman stated that both he and Granham thought it premature to consider the taxonomy of the toxoplasmas before definite information with regard to the life cycle of the organism was obtained in the different laboratories now carrying out active research on this subject.

Minute 4. *Toxoplasmosis in pregnancy.* Zasukhin introduced the following Russian workers, who spoke on toxoplasmosis in pregnancy: Prof. I. I. Grischenko, Dr. Niconova, Dr. Sigiste, Dr. Mulatov, and Prof. Kazanzen.

From a WHO meeting of investigators on toxoplasmosis, held in Geneva in 1968, the report of which is being published shortly, Siim mentioned the following opinions of this group:

(i) Congenital toxoplasmosis is acquired by the fetus, when the mother has an asymptomatic or mild infection with parasitaemia; (ii) subsequent pregnancies, as a general rule, will not result in further congenital infections; (iii) any mother with antibodies at the time of conception will have no congenitally infected offspring.

With regard to abortion it was emphasized by the same WHO-group that: (i) abortion is a single event as a complication of a primary acute toxoplasma-infection; (ii) evidence that toxoplasmosis is a significant cause of spontaneous abortion is still open to question; (iii) studies be continued in a most precise manner, i.e., investigations should be carried out as double-blind trials (with proper positive as well as negative controls).

Finally, Dr. Remington spoke on immunity in experimental toxoplasmosis, both humoral and cellular.

Minute 5. *Adjournment.* The meeting was adjourned.

J. Chr. Siim, Chairman

International Committee on Systematic Bacteriology Subcommittee on the Genus *Toxoplasma*

Minutes of Meeting, 10 August 1970

Mexico City, Mexico

Minute 1. *Call to order.* The meeting was called to order by the chairman, J. Chr. Siim, on 10 August 1970.

Minute 2. *Record of attendance.* Members present were H. A. Feldman and J. Chr. Siim. Absent were C. Cole, P. C. C. Garnham, and D. N. Zasukhin.

Minute 3. *Approval of agenda.* The agenda had been forwarded on 18 June 1970 to each member of the subcommittee who had acknowledged its receipt and suggested no changes.

Minute 4. *Report of the Chairman.* Since the meeting in Moscow in 1966, an informal meeting was held in Leningrad in 1968.

A meeting of investigators on toxoplasma sponsored by WHO was held in Geneva, Switzerland, from 25 to 29 November 1968. C. Cole, H. A. Feldman, P. C. C. Garnham, J. Chr. Siim, and D. N. Zasukhin were invited participants, and all but the last attended. The report of that meeting has been published as WHO Technical Report Series No. 431, 1969.

Minute 5. *Report of Subgroup on Tax-*

onomy. The chairman of the Subgroup on Taxonomy of *Toxoplasma* presented a progress report.

Minute 6. *Acceptance of a standard antitoxoplasma serum.* After an international assay had been carried out under the auspices of an Expert WHO Committee, a standard antitoxoplasma serum was accepted by the Biological Standardization Committee. This serum is supplied on demand from the Department of Standardization at the State Serum Institute in Copenhagen. The establishment of reference laboratories in different geographic areas was recommended but has not yet been implemented.

Minute 7. *Future work.* Future work will continue the attempts to define the biological

relationships of the toxoplasmas.

Minute 8. *Next meeting.* The next meeting of this subcommittee will be held in conjunction with the next International Congress.

Minute 9. *Open meeting.* An open meeting of the subcommittee was held on 11 August 1970.

Minute 10. *Present membership.* The present membership of the subcommittee is as follows: J. Chr. Siim (Chairman), Copenhagen, Denmark; C. R. Cole, Columbus, Ohio, USA; H. A. Feldman, Syracuse, New York, USA; P. C. C. Garnham, Berkshire, England; D. N. Zasukhin, Moscow, USSR.

Minute 11. *Adjournment.* The meeting was adjourned.

J. Chr. Siim, Chairman

Report (1969–1970) of the Subgroup on Taxonomy of *Toxoplasma* of the Subcommittee on the Genus *Toxoplasma*

14 August 1970

Mexico City, Mexico

Since the last informal meeting of the subcommittee in Leningrad in July 1969, the problem of the classification of *Toxoplasma* has become clearer because of new discoveries concerning the life cycle of the organism.

The research began when Hutchison showed in 1965 that the feces of cats, which had been fed cysts of *Toxoplasma gondii*, contained a resistant, long-lived, infectious form of the organism.

It was finally proved late in 1969 that the nature of this form was coccidian, first by Siim, Hutchison, and Work, and almost simultaneously by Frenkel and Dubey, and by Sheffield. The work was further confirmed by observers in Germany (Piekarski, Werner, Janitschke, and Weiland), in Holland (Overdule), and in Hawaii (Wallace).

Oocysts seen in the cat's feces possessed a disporocystic, tetrazoic structure, and the endogenous stages were those of a typical coccidian with rapid schizogony and gametogony throughout the small intestine.

Some workers at once jumped to the conclusion that the genus *Toxoplasma* would have to be replaced by the genus *Isospora*, owing to the structure of the oocyst, and this was attempted in a publication by Overdule (1970). It was a "conditional proposal," not in

accordance with the new "Règles." However, the similarity in the structure of the oocyst does not necessarily mean that the genera are the same. For example, there are several compartments in Hoare's table of the coccidia which contain more than one genus (e.g., *Pfeifferinella*, *Schellackia*, *Tyzzeria*). The profound differences in the life cycle of *Toxoplasma* (with its extra or aberrant cystic and pseudocystic development, involving multiplication by endodyogeny) clearly indicate that it is not *Isospora*, though when the full life cycle of certain species of the latter are known (e.g., *I. hominis* and *I. bigemina*), it may be necessary to remove them to *Toxoplasma*.

At present, therefore, it would seem unwise to interfere with the present name of *Toxoplasma*. It is necessary, however, to remove this genus from the subclass *Toxoplasmatea*, which was created for it by Biocca, and place it in the *Coccidia*. Scholtyseck et al. have proposed the creation of a new family, *Endodyococcidia*. The positions of the other genera in the subclass *Toxoplasmatea*—*Sarcocystis*, *Frenkelia*, and *Besnoitia* remain obscure at present, and it would probably be better to defer the introduction of new names until further investigations are completed on the whole group.

P. C. C. Garnham