vidual twin. While congenital junction has had different theories for its origin (one factor, anoxia in the embryo) as described by Gedda in one of his books and by Luow in his masterly paper in Vienna, it now gets the sanction of world-wide visitors studying a scientific exhibit with these data included (Callahan 1965-1974).

Types that confirm these observations include *Xipho-Omphalopagus* — one unseparated set being Eng and Chang one hundred years ago, 1811-74, with 277 descendants in 1974. Likewise, a living 26-year-old set still united. Similarly joined were other now separated sets with healthy normal survivors. Next, *Craniopagus* — the oldest known living ones, recorded by Todorov, now healthy and living. Other sets, now separated, are also living as individuals. Finally come *Pygopagus*, appearing most extangled at birth, but of a pleasing appearance when separated, and *Manuopagus*, joined at their hands.

Studies in genetics, fertility, and sterility, will be made in twins, siblings, and parents, as these sets mature, marry, and reproduce or not.

George B. Callahan, M.D., 4 South Genesee Street, Waukegan, Illinois 60085, USA

FREQUENCY OF THORACO-OMPHALOPAGUS CONJOINED TWINS

SIWAPORN UBOLCHOLKET

Department of Anatomy, Songkla Nakarin University, Songkla, Thailand

A review of literature shows that MZ twinning has low heritability and little racial variation. In Thailand, however, almost every case of conjoined twins is of the thoraco-omphalopagus type. It is recessive and not sex-limited.

The survey includes over 200 twin pairs. Each pair had a common heart and a common liver, and was connected at the xiphoid cartilage down to the level of the umbilicus. Different feelings and marked differences in personality are stressed. Every pair has been successfully separated.

Dr. Siwaporn Ubolcholket, Department of Anatomy, Songkla Nakarin University, Haadyai, Songkla, Thailand

MORPHOLOGIC AND CYTOGENETIC STUDIES ON CONJOINED TWINS

BL. P. KONSTANTINOVA

Central Laboratory of Teratology, Center for Maternity and Child Protection, Medical Academy, Sofia, Bulgaria

Two sets of male conjoined twins have been observed. Both were born at term and after a normal pregnancy. The first was a *bicephalus* born to an epileptic mother, a primipara aged 18 who suffered from a severe flue during the first two months of pregnancy. The second was a *pygothoracopagus* born to a 23-year-old mother with a living normal child.

The bicephalus showed four normally formed extremities, atresia of ampula recti, two hearts, both connected. The left heart had multiple malformations. All the left-side internal organs (kidneys, gonads, and others) were not fully developed. The left umbilical artery was missing.

In the pygothoracopagus, one of the twins was well developed, while the other one, the " parasite ", was without head, joined with the abdominal and thoracic parts of the developed twin, and with less developed body and extremities; the abdominal cavity of the parasite was quite slightly developed; in fact it presented one heart of the abdominal cavity of the developed twin and it contained a big kidney with the shape of a horseshoe. The left eye was double in size as compared to the right one, consisting of one formed and one rudimentary eyeball; on the same side a rudimentary second mouth could be seen. The umbilical cord had five blood vessels (four umbilical arteries and one umbilical vein): it is evident that the twins had a common blood circulation for all their organs.

The cytogenetic study of the organs of the parasite showed high aneuploidy, which was not revealed in the normally developed twin.

Prof. Bl. P. Konstantinova, Central Laboratory of Teratology, Belo More St. 8, Sofia 27, Bulgaria