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CANNIBALISM AS A FACTOR FAVOURING THE SPREADING OF A VIRUS DISEASE

ABSTRACT. — *Kuru — a disease occurring in the Eastern highlands of Papua New Guinea provides evidence of the fact that cannibalistic rites may have an accelerating effect on morbidity and mortality rates. Kuru is restricted to the Melanesian tribe of the Fore peoples who in their ritual cannibalism observe the traditional division by sexes even in their cultic matters. Kuru is a slowly progressing virus infection which was transmitted through the contamination of closely related tribe members after the skull of a deceased kuru victim had been opened. Since the traditional mourning rite had been partly abandoned, epidemiological findings changed over the past two decades, of which a decrease of the disease in pre-adolescents and adolescents is characteristic.*

KEY WORDS: *Cannibalism — Kuru disease — Mortality rates — Mourning rite — Consumption of human brains — Epidemiological conclusions.*

Analogous to the classification of the australopithecines (Le Gros Clark, 1964; Robinson, 1967; Tobias, 1978) it seems to be justified to classify (in the sense of a "moderate splitting classification" Jacob, 1979) the early australides and the pithecanthropoids of South-East Asia into robust and gracile types. In the same way as the robust Cohuna Kow Swamp group of Australia can be contrasted with the gracile Lake Mungo skeletons (Bowler—Thorne, 1976; Thorne, 1971, 1976; Thorne—Macumber, 1977) there is, among the Indonesian Archanthropines, a similar remarkable contrast of *Pithecanthropus modjokertensis* and *Pithecanthropus soloensis* with *Pithecanthropus erectus* (Jacob, 1974, 1975, 1976, 1979). It cannot be totally excluded that *Pithecanthropus modjokertensis* should be considered to be the initial form of the other two. It is possible that *Pithecanthropus erectus* initiated a development which may have led to hitherto unknown progressive late forms of this species as well as to early primitive forms of *Homo* deductible from the former. "These still missing links were major factors in the peopling of East Indonesia" (Jacob, 1979, p. 9).

The findings made in Ngandong have recently been interpreted as skull bowls. Von Koenigswald initially called them skull or head trophies (Koenigswald, 1939, 1956, 1958). In the subsequent time he changed his mind and adopted the view that they were, analogous to the findings in the Australian aborigines, drinking bowls held sacred through magic and tradition (Koenigswald, 1975; Schott, 1979).

Without undervaluing the importance which must be attached to views of this type as well as to Jacob's chain of reasoning — who incidentally put up Pleistocene cannibalism for discussion (Jacob, 1972) — it should not escape one's notice that many a hint provides evidence to the assumption of headhunting and cannibalism (Gieseler, 1974; Roper, 1969; Vogel, 1974; Weidenreich, 1939). The findings of Ngandong, where it seems likely in five cases that the whole of the skull base had been purposely removed (I, IV, V, IX, X) (Koenigswald, 1939, 1956, 1958; Oppenoorth, 1937; Weidenreich, 1951), prompt the question to be raised whether magic cannibalism in one of its varieties (Behm—Blanke, 1962) may be linked to an extinction of

the population. Kuru, as it is known from current clinical and pathological anatomy, provides hints to the fact that cannibalistic rites may have had an accelerating effect on morbidity and mortality rates.

Zigas investigated kuru in the Eastern highlands of New Guinea ("Papua New Guinea") in 1955 (Zigas, 1959; Zigas—Gajdusek, 1957). Its occurrence is limited to the Melanesian tribe of the Fore peoples who settle in a number of adjacent valleys in the interior of the Eastern Highlands. The disease was detected on an area of some 1,000 sq. km. with about 160 settlements and a population of about 35,000 to 40,000 (Alpers—Gajdusek, 1965). Between 1957 and 1959 the annual death rate was 18.5 per thousand for the Southern Fore and 8.7 per thousand for the Northern Fore peoples, and between 1961 and 1963 it was 15.3 per thousand for the Southern Fore and 4.4 per thousand for the Northern Fore peoples. Kuru is said to have been observed for the first time between 1920 and 1925 (McArthur, 1964), but its majos breakthrough came apparently as late as in the forties and fifties. Since the beginning of the sixties a decrease has been observed. The bimodal character of the curve of the age in which female tribe members were affected by the disease could no longer been observed as from the second half of the sixties. According to more recent findings the disease affects pre-adolescents and adolescents only in rare cases.

The kuru syndrome is a neurological disease with a major involvement of the spino-cerebral system (Becker, 1966). A rapidly increasing locomotoric ataxy is followed by a tremor of the extremities, the head and the trunk after a few weeks. During the first few months patients occasionally fall into an unmotivated continuous laughter which apparently is backed up by a euphoric mood. After six months at the latest the patients are no longer able to walk and they are affected by urinary and rectal incontinence. The patients waste away and death comes six to fifteen months after the disease had started. It seems that curing has not been reported by now.

Gajdusek, Gibbs and Alpers (1965, 1966) succeeded in proving that the kuru syndrome is a slowly progressing (chronical) virus infection. "The virus has been regularly isolated from the brain tissue of kuru patients. It attains titer of $=10^8$ infectious doses/g" (Gajdusek—Gibbs, 1977, p. 23). However, no virus could be detected in the urine, the spinal fluid, placenta and other tissues of kuru patients. The virus was also isolated in chimpanzees (9, 13) as well as various other monkeys from the Old and New World after transmission (Gajdusek—Gibbs, 1975; Gibbs—Gajdusek, 1975). The mink was the first host from the order of the non-primates to which the kuru virus could be transmitted too. What are then the transmission mechanisms which are responsible for a spreading of the kuru syndrome among the Fore people? It was only a couple of decades ago that the Fore peoples came into contact with Europeans. The seclusion and remoteness of the mountainous areas where they live

were a factor favouring the fact that they stuck to very ancient tribe traditions in both the field of material culture and that of rites and customs. So up to recent times men lived in strong separation from women and children (Fischer—Fischer, 1960). Obviously, the Fore people, in their ritual cannibalism as a rite of mourning and homage to a deceased tribe member, observed such a division by sexes also in their cultic matters. In all probability, the kuru virus was transmitted through a contamination of closely related persons within a mourning family group after they had opened the skull of a deceased tribe member: "... in a rite of cannibalism, during which all adult females and children of the kuru victim's family were thoroughly contaminated with the virus" (Gajdusek—Gibbs, 1977, pp. 21 f.). In more recent times, they have partly abandoned this mourning rite under the influence of Western civilisation. This caused a change in the epidemiological findings made in the past two decades which is in line with the expectations made with regard to the above statements (Gajdusek, 1972, 1973). Up to recent years it was a characteristic feature of kuru that adult females displayed an above-the-average mortality. This in turn led to a sex ratio in favour of males which in some settlements amounted to 3:1, and to 2:1 for the Southern Fore peoples (Gajdusek—Zigas, 1957, 1959). A 50:50 sex distribution of the disease was observed among kuru affected children (25 per cent of all cases) while only 5 per cent of the older-than-twenty and 2.5 per cent of the more-than-thirty years old patients were males (Williams et al., 1964).

It is very difficult to find a plausible explanation for the incidence of the kuru virus. It cannot be excluded that a sporadic case of the global Jakob Creutzfeldt syndrome had triggered off the kuru epidemic among the Fore. Evidence for this assumption is provided by the fact that a spontaneous case of the Jakob Creutzfeldt syndrome could be identified in the Chimbu living in the central highlands of New Guinea. "Serial passage of brain in man in successive cannibalistic rituals might have resulted in a change in the clinical picture of the disease, with modification of the virulence of the original agent" (Gajdusek—Gibbs, 1977, p. 22). Equally justified is the assumption that the continuous consumption of human brain by closely related tribe members has caused or favoured the generation of a new virus.

There is no reason for saying that the findings and reflections made have answered the question for causes of the extinction of certain fossil groups of men. The question raised at the beginning of this paper, i.e. whether certain cannibalistic rites should be linked to the extinction of the *Pithecanthropus* population of Ngandong, was meant to be a provocative question causing further reflections. However, no one will doubt that epidemics might have been potential causes for the extermination of small population groups in the ancient and recent racial history of mankind. Kuru can be considered as a model for such epidemics which resulted in the extermination of small populations in the Pleisto-

cene era of the hominides. Connections with ritual cannibalism cannot be totally excluded as is clearly shown by the kuru model.

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