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EVOLUTION OF MAN IN SOUTHEAST ASIA[1)]

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According to our present knowledge Southeast Asia has been occupied by man for about two million years, based on the Potassium-Argon dating of the Jetis beds at Kepuhklagen, north of Mojokerto, East Java (Jacob & Curtis, 1971), where a child skull of *Pithecanthropus modjokertensis* was found in 1936. At Sangiran, Central Java, other remains of this species have been found in the Jetis beds (TABLE 1), such as Sangiran 1b, 4 and 9.

TABLE 1.- Hominid fossils from Sangiran, Central Java (1936–72)

Code Number*)	Fossils	Years of Discovery
	Period of 1936–41	
S 1a	Upper jaw, right corpus fragment	1936
S 1b	Lower jaw, right corpus	1936
S 2	Skull cap	1937
S 3	Skull cap	1938
S 4	Skull	1938–1939
S 5	Lower jaw, right corpus	1939
S 6	Lower jaw, left and right corpus fragments	1941
S 7	Teeth	1937–1941
	Period of 1952–72	
S 8	Lower jaw	1952
S 9	Lower jaw, right corpus	1960
S 10	Skull cap and left cheek bone	1963
S 11	Teeth	1963
S 12	Skull cap	1965
S 13a	Skull vault fragments	1965
S 13b	Skull fragments	1965
S 14	Skull base fragments	1966

1) This article was presented at the First Regional Seminar on Southeast Asian Prehistory and Archaeology, Manila, in 1972, and incompletely published in the Proceedings by the National Museum of the Philippines in 1974.

TABLE 1.- Continued

Code Number*)	Fossils	Years of Discovery
S 15a	Upper jaw, left corpus fragment	1968
S 15b	Upper jaw, right corpus fragment	1969
S 16	Teeth	1969
S 17	Skull	1969
S 18a	Skull vault fragments	1970
S 18b	Skull vault fragments	1970
S 19	Occipital fragment	1970
S 20	Skull vault fragments	1971

*) The new code numbers are given to avoid confusion. Old codes were given according to parts of the skeleton and the discoverer's taxonomic diagnosis. Some specimens had several codes and some had none; some had excavation numbers and museum numbers, and others changed museums.

Several mandibular fragments and one maxillary fragment found in the Jetis and boundary beds (lowest part of the Kabuh formation) of Sangiran are classified by some authors as *Meganthropus palaeojavanicus*, but we need additional finds beside jaws to confirm their taxonomic status. *Meganthropus* might be just another species or race of *Pithecanthropus* or *Australopithecus;* some workers consider it as *Pithecanthropus habilis*. All the three mandibular fragments of *Meganthropus* show robust bodies (including the base) and all show big teeth (Marks, 1953; Tobias & von Koenigswald, 1964).

Remains of *P. erectus* were discovered in East and Central Java at Kedungbrubus, Trinil and Sangiran. It is a more progressive form and lived between one million and 400,000 years ago (von Koenigswald, 1964, 1968a). The chronometric date of the remains found in the upper layers of Middle Kabuh is about 830,000 years (Jacob, 1972). More finds of *P. erectus* have been found than those of *P. modjokertensis*, and therefore, we know more about his morphology. It seems that he was widely distributed, not only in East Asia, but in Africa and Europe as well.

The body of *P. erectus* seems to differ not insignificantly from modern man. His stature is around 170 cm and his cranial capacity ranges between 750–1000 cc, thus approaching the lower end of the modern range. The skull, however, is quite different, and it is in the skull that the taxonomic differences are found. Bony processes and crests are very pronounced, because of the small size of the skull and the well developed muscles, especially the neck and masticatory muscles. The skull is low with a receding forehead, and the broadest part of it is down near the base. This is a very important feature, not found in *Homo* skulls. The supraorbital tori are very prominent, creating a conspicuous constriction behind them. These features are emphasized by the lack of development of the frontal lobe of the brain. Furthermore, the nose is broad and the mouth region protruding. The chin is absent and the cheek teeth are large. Significant differences are also encountered on the base of the skull. In addition, bones

of the skull vault are very thick, particularly in the region of the superstructures, such as the occipital torus and the asteriac process (Jacob, 1971).

A more progressive form of *Pithecanthropus* is *P. soloensis* which fossils were found at Ngandong, East Java; he is more primitive than Neanderthal man, however, and his antiquity seems to be greater than hitherto supposed. The stature of Ngandong man varies between 165–180 cm and the cranial capacity between 1000–1300 cc. Therefore, the skull is larger, higher and rounder than in *P. erectus*, but still the broadest part of the skull is near the base and the bony processes are very pronounced. Significant differences are found on the base of the skull which in some cases are unique for *P. soloensis*, such as the presence of an accessory oval foramen with the usual foramen ovale in a common fossa (Jacob, 1967a).

Of the available finds the number of *Pithecanthropus* males exceeds that of the females. This might be due to the bias in sex identification or to the fact that male bones are better preserved, but it is also possible that males had a longer life than females in prehistoric times. Many females died at the peak of their reproductive period. The average age in *P. erectus* is between 20–30 years; only a few lived beyond 40 years. In *P. soloensis*, however, the number of females is higher than that of the males and older individuals are also found (Jacob, 1969a; Acsadi & Nemeskeri, 1970).

Some of the finds exhibit pathological conditions. One of the thighbones from Trinil shows abnormal bone growth which might have been preceded by an inflammation. Signs of inflammation or infection are also present in a Sangiran jaw and several Ngandong skulls (Jacob, 1967a; von Koenigswald, 1968b; Day & Molleson, 1971)

The first modern man in Southeast Asia is represented by the Wajak-Niah-Tabon group. They might have evolved from the late pithecanthropine stage. Their antiquity goes back to 40,000 years and their distribution covers the whole Southeast Asia including the Sundaland The Australomelanesoid and early Malay sub-races might have descended from the group (Brothwell, 1960; Fox, 1962, 1967, 1970; Jacob, 1967a).

The stature of Wajak man is about 170 cm and the cranial capacity between 1500–1600 cc. The skull is long with a bun-like protrusion in the occipital region. The face is wide due to the laterally projecting cheekbones. In addition, the face is also very flat and has a wide nasal root and protruding mouth region. The lower jaw is big and contains relatively large molars. Thus, we encounter both Mongoloid and Australomelanesoid features in the Wajak skull (Jacob, 1967a).

Mesolithic or Epipaleolithic remains were found in Muang Thai, Malaysia, Vietnam, Indonesia and the Philippines. During this period the influence of the Australomelanesoid race was predominant in this part of the world, including the western and northern parts of Southeast Asia. Several more or less distinct groups can be recognized, among others the Hoa-Binhian, the Sampung cave and the Toalan cave groups (Jacob, 1967a, 1969b).

The Hoa-Binhian group is represented by human remains found in shell middens in Vietnam, West Malaysia and North Sumatra (Jacob, 1967ab). From the middens of Gua Kepah we have mandibular fragments of 18 individuals, cranial fragments of 24 individuals and 391 teeth. The skulls are long and have strong muscular markings in the nuchal region. The nasal root is broad. Stature varies between 155–170 cm. The lower jaws are less robust than in the present day Melanesians. The molars are larger than in Niah man and shovel-shaped incisors are more frequently found than in the Australoids but less than in the Indonesians. Beside the usual dental caries, there is a case of dental granuloma in a lower jaw of an old man from Gua Kepah. Due to shellfish eating and the generally coarse diet dental wear is extensive, which is also corroborated by many cases of marginal enamel fractures. From the size of the shell heaps and the number of burials it can be calculated that the population enjoyed sufficient diet, at least in terms of protein.

The mean age at death in the Gua Kepah population is around 30 years; only three individuals are older than 50 years. Sex ratio is 62.5, probably due to the death of many males outside the dwelling place.

A skeleton found in a kitchen midden in Tamiang, Aceh, in 1965, associated with „Sumatraliths" and mammalian teeth, is that of a 40–year old female with a stature of 153 cm. Like another skeleton found in another midden in Tamiang in 1929 the skull is also dolichocranic. Both the Tamiang and Gua Kepah populations are a mixture of Mongoloid and Australomelanesoid races.

The Sampung group is represented by skeletal remains found in caves in East Java. The skull from Guwo Lowo, Sampung, is long and has a poorly filled temporal fossa, a deep nasion notch and occipital bulging. The vault of the skull is keeled and the sidewalls are vertical. The browridges are well developed and the nose is broad. Dental dimensions are comparable to Gua Kepah. Body height varies between 165–170 cm. All these features point towards the Australomelanesoid race (Mijsberg, 1932; Jacob, 1967a).

The Toalan group is represented by the finds from caves in Southwestern Sulawesi and Flores. From Sulawesi most of the finds are isolated teeth. Mongoloid elements are more evident here than in the Flores cave populations as demonstrated by the incidence of shovel-shaped incisors and enamel pearls in premolars. Most skeletons from Flores came from Liang Momer; their antiquity is 3550 years B. P. as shown by a radiocarbon date obtained from bones from Liang Toge. Stature varies between 148–170 cm and the cranial capacity between 1200–1300 cc. The skulls are usually long and the face medium broad. The lower jaws are robust and the teeth are large, comparable to those from Gua Kepah. Those Flores cave populations seem not to differ very much from the present populations of the Little Sunda Islands; both groups contain Australomelanesoid racial element (Jacob, 1967a).

Dental caries is encountered in the Sampung population, but the incidence is higher in the Toalan populations. In the latter dental size is much reduced, but not to the extent found in later post-Neolithic populations.

Neolithic and later sub-recent populations do not differ significantly from the present populations in the same area. From Indonesia Neolithic skeletal remains are scarce and most of the Megalithic remains are too damaged for a thorough study.

Gua Cha remains from West Malaysia show Melanesian influence in their cranial and dental features (Trevor & Brothwell, 1962). Australomelanesoid influence is also found in the Bronze-Iron Age populations of West and East Java and Sumba (Snell, 1938, 1948; Jacob, 1964). The dolichognathic, thick lower jaw from Anyer Lor in West Java has small-sized teeth. And from dental studies we know that the Bronze-Iron Age people of Gilimanuk in Bali display Mongoloid elements, such as shovelling of the anterior teeth, winging of the incisors, the occlusal patterns surface of the molars and premolars, and the crown dimensions (Jacob, 1967b).

It is important to note that dental caries became more frequent in the Paleometallic Age. Dental filing, either labial or occlusal, was not found earlier than the Neolithic.

SUMMARY

Evolution of man in Southeast Asia was discussed, beginning with the oldest hominid remains from the region and proceeding towards the sub-recent skeletons of the Bronze-Iron or Paleometallic Age. The influence of the older remains on the living races is relatively little. Starting with the Mesolithic or Epipaleolithic we have populations that resemble the present populations, at least in certain traits and in certain areas.

It is evident that in the western and northern parts of Southeast Asia Mongoloid elements have become stronger through time, whereas in the eastern and southern parts the Australomelanesoid elements are still predominant. In the Wallacea area in between mixed populations were more common. In Sulawesi and Bali, however, Mongoloid strain is more pronounced. The differences between the Neolithic and the Bronze-Iron Age people on one hand and the living races on the other are considerably less.

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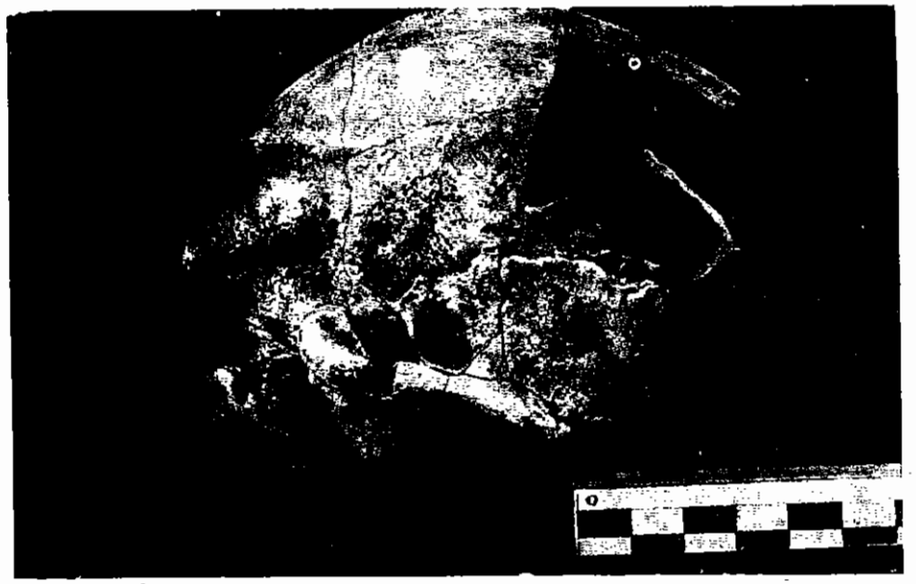

FIGURE 1.— Sangiran 10, right lateral view. A skull cap of *Pithecanthropus erectus*. Note the mastoid process, the supramastoid crest and the thick bone of the vault.

FIGURE 2.— Wajak 2 and Hong Kong maxillae, distoocclusal view. The latter specimen was obtained by von Koenigswald in a Hong Kong drug store and most likely originated from South China (Jacob, 1968). It shows characters resembling Wajak.

FIGURE 3.— Ngandong 7, occipitobasal view. A calvaria of *Pithecanthropus soloensis*. The triangular prominence, occipital torus and retromastoid tuberositics are well marked. Note the orientation of the foramen magnum in two planes, and the shape of the occipital condyles.

FIGURE 4.— Sangiran 18a, endocranial aspect. Supraglabellar fragment of a frontal bone. Observe the frontal crest and the massive glabellar portion.

FIGURE 5.— Gua Kepah C 77 jaws, right lateral view. Note the edge-to-edge bite (Jacob, 1967a).

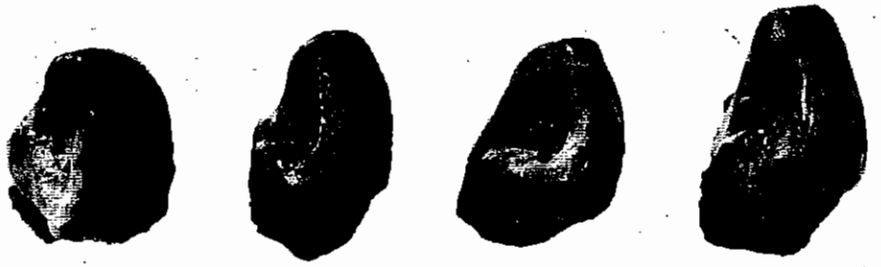

FIGURE 6.— Leang Chodong (formerly known as Leang Tjadang) upper incisors, occlusal view. The marked shoveling, the attrition of the lingual crests and the labial crests are clearly demonstrated (Jacob, 1967a).

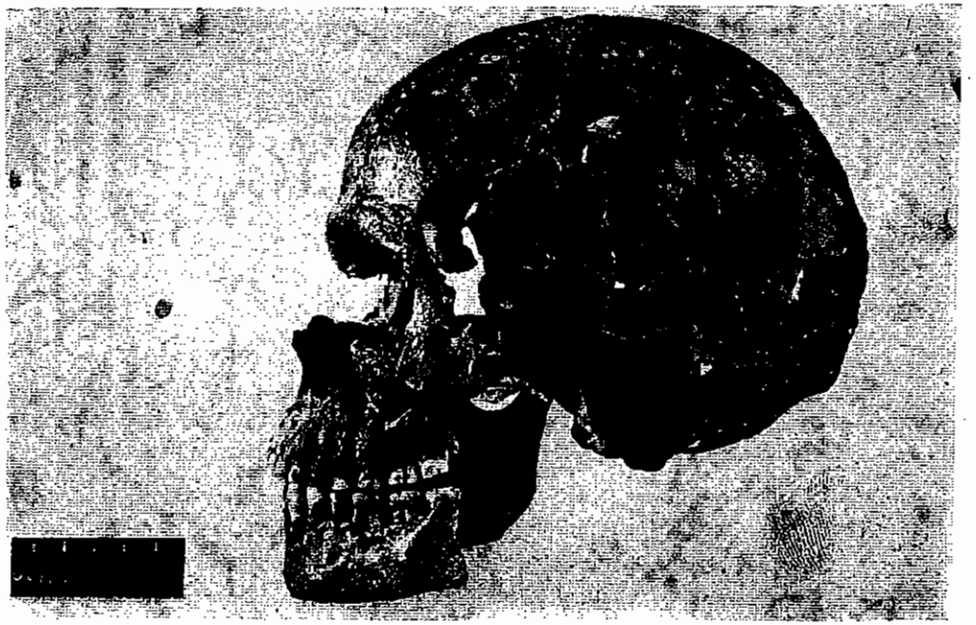

FIGURE 7.— Liang Momer skull E (Flores), left lateral view. The superciliary arch is well developed and the occipital region shows a typical contour (Jacob, 1967a).

FIGURE 8.— Sangiran 1b, Anyer and recent Javanese mandibles, basal view. Note the relatively thin base of the mandible of *Pithecanthropus modjokertensis* and the differences in the symphyseal region.

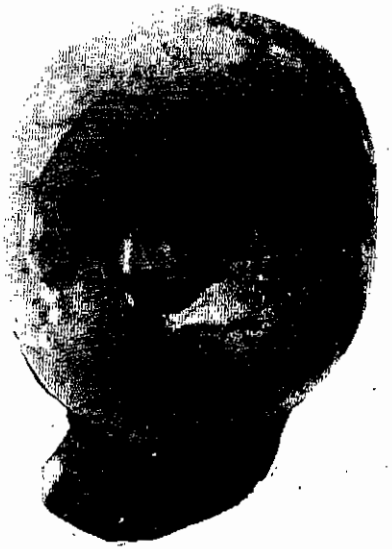

FIGURE 9.– Leang Chodong lower premolar, occlusal view. Note the enamel pearl (Jacob, 1967a).

FIGURE 10.– Gilimanuk R VIII A, basal view. A skull of an old male. We can observe the heavy attrition of all teeth, with caries and infection, and the arthritic left temporomandibular joint.