

THE SECOND ADOLESCENT (FEMALE) ILIUM OF *AUSTRALOPITHECUS PROMETHEUS*

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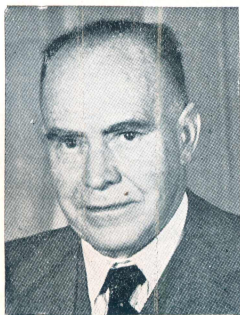
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ABSTRACT.—The first pelvic fragments of *Australopithecus prometheus* were those of an adolescent male found in 1948; this second adolescent ilium is apparently female and was found on April 30, 1956. The human characteristics of the first ilium are reviewed and are corroborated by this second specimen. The female antero-posterior length 102 mm. is slightly less than in the male 108 mm. but the distances from the anterior and posterior superior iliac spines to the acetabulum are definitely greater than in the male. The female ilium has a more slender build, more pronounced concavity and convexity, a greater lateral flaring of the iliac crest, a more obtuse sciatic notch, a deeper groove for the reflected head of the rectus femoris on its distinctly longer shank and an articular area of elliptical form.

Vertical sections through Australopithecine and Bushman ilia display an even greater thickening of the compact bony stratum or pillar of bone above the acetabulum in *Australopithecus*. In addition the natural split-lines in the fossils show not in anthropoid pattern as Mednick (1955) imagined possible, but in typically human pattern.

INTRODUCTION

I deeply appreciate the honour extended by Dr. M. R. Sahni, the distinguished President of the Palaeontological Society of



India in requesting me to contribute an article to the valuable journal that this Society has recently established under such happy auguries; and, particularly I welcome in so doing the opportunity of conveying thereby my tribute of homage to Dr. D. N. Wadia in this Jubilee Number for his out-

standing and fundamental contributions to the understanding of the remoter prehistory of his native land.

Eight years ago I described (Dart 1949) the first innominate fragments from Makapansgat Limeworks, which comprised an almost complete ilium MLD 7* (see figs.

1 and 2) and the major portion of a right ischium MLD 8 of an individual deemed to be masculine. They had been found in a small piece of the grey breccia and had obviously come from an adolescent australopithecine; probably from the same individual that had furnished the adolescent male mandible MLD 2 discovered in the process of the same season's work (Dart 1948).

Recently, during the course of developing some of the grey breccia stored in the Bernard Price Institute for Palaeontological Research, there was discovered a further adolescent left ilium MLD 25, which appears to be female (see figs. 1 and 2) on April 30, 1956. Unfortunately it had suffered an accident prior to its fossilisation, that had removed a triangular segment of the bone including a considerable portion of the crest. As the crest was present in the male specimen and is intact anteriorly and posteriorly in this new one, the loss of the intervening middle part is not as serious as might appear at first sight. Further, the first ilium to be recovered having also been adolescent and virtually complete the characteristics of the australopithecine adolescent bone are already well known; so the comparisons to be drawn here between the two specimens are based upon extremely satisfactory

* The letters and numerals refer to the departmental catalogue.

material. As the only portion of this new pelvis recovered so far is the ilium, attention will be restricted here necessarily to that bone.

The principal general features in which the first adolescent australopithecine ilium was found to diverge from the adolescent

concavity: the anterior concavity facing inwards and the posterior one facing outwards. The approximately coronal body plane the blade occupies in anthropoids thus becomes twisted anteriorly so that it assumes in the australopithecine body as in man an almost sagittal plane.

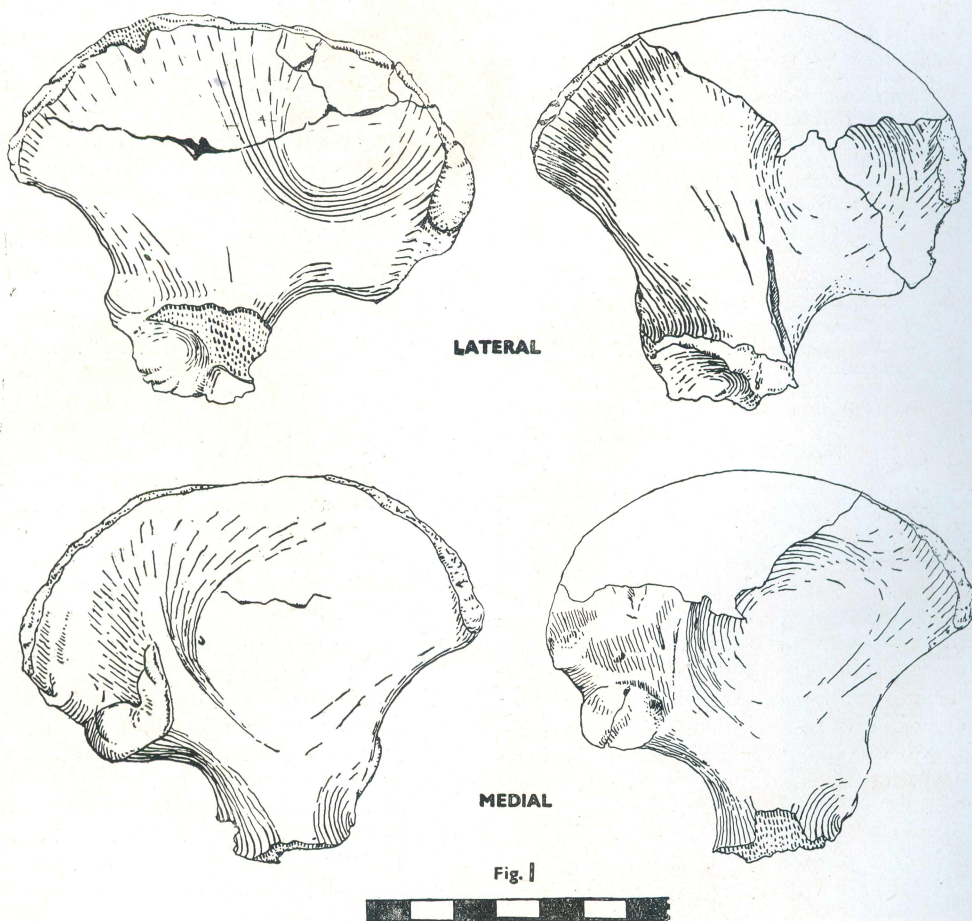


FIG. 1—Lateral (or gluteal) and medial (or sacro-pelvic) aspects of the male (left) and female (right) adolescent australopithecine ilia. For the purpose of comparison the ilia were traced dioptrically as they appeared when laid flat on the table. Then the drawings were oriented on horizontals drawn from the inferior margin of the anterior superior iliac spine at an angle of twenty degrees above a line drawn from the same point and tangential to the inferior margin of the auricular area for articulation with the sacrum.

anthropoid and to resemble the adolescent human bone (Dart 1949) are its shortening and widening and the twisting of the flat iliac blade (the anthropoidal plate of Reynolds, 1931) into a volute with a double

This new ilium (vide figs. 1 and 2) so closely resembles the previous one in form and size that it also is patently australopithecine. Being also a left ilium it obviously came from a second individual. Clearly also it is of

approximately the same, if not identical age as the three parts ilium, ischium and pubis were still not united; but the bone differs in robusticity and form to such a degree as to lead us instantly to the assumption that it came from an individual of the opposite (female) sex. In consequence it is desirable, despite the adolescence of the two bones, to record their comparative features.

Further it is an extraordinary occurrence that two adolescent ilia of apparently opposite sex but virtually identical age should be found in close company in this deposit. The boy was killed by a bone-smashing blow on the chin from a club or fist. Were they brother and sister twins, that shared in death the same cannibalistic fate?

CHARACTERS OF THE FIRST (MALE) ADOLESCENT AUSTRALOPITHECINE ILIUM

The Makapansgat male adolescent ilium demonstrated firstly that the innominate bones and therefore the pelvis and lower body framework of *Australopithecus prometheus* were quite unlike those of the semi-erect chimpanzee, but on the contrary resemble closely those of the living *Homo sapiens*, as typified by the Bushman. Secondly the iliac and ischiadic fragments corroborated the previous discovery of Broom, Robinson and Schepers (1949) at Sterkfontein that the human type of adult pelvis found there definitely belonged to an *Australopithecus (Plesianthropus)* and not, as some critics had preferred to believe at that time, to some more advanced type of bigger-brained human being, that might have existed contemporaneously.

Thirdly, the excellent state of preservation of the bones enabled me to describe for the first time in great detail the anatomy of the australopithecine innominate bone, especially that of the virtually complete ilium, and to compare it with the iliac element of the pelvis in the adolescent chimpanzee, Bushman and Negro.

This comparison showed

1. that the area of the lateral or gluteal aspect of the male juvenile australopithecine ilium was actually about 10 per cent greater than that of a male juvenile Bush ilium of the same age;

2. that the australopithecine iliac crest is not short and straight like that of the chimpanzee but long and sinuous like that of sapient human beings;
3. that the adolescent australopithecine iliac crest differs from the majority of adolescent sapient human iliac crests in lacking a prominent "cristal tubercle" and subjacent "buttress"; but that in this respect it resembles closely the adolescent Bush iliac crest. In both australopithecine and some Bush adolescent crests the localised "cristal tubercle" is replaced by a thickening which is less pronounced in the *Australopithecus* than in the Bushman crest.
4. that the anterior superior and anterior inferior iliac spines in *Australopithecus prometheus* are well developed; and that, in consequence, as compared with anthropoids the inguinal ligament and abdominal musculature were relatively strengthened and the sartorius acted with increased advantage from above, while the straight head of the rectus femoris and Y-shaped ligament of Bigelow operated with correspondingly greater precision upon the knee-joint and hip-joint respectively below in *Australopithecus* as compared with living anthropoids;
5. that the posterior part of the adolescent male australopithecine iliac blade is phenomenally thick in contrast with the corresponding part of the chimpanzee iliac bone. In that respect the australopithecine male ilium not only resembles the sapient human ilium but exceeds in thickness the posterior part of the female adolescent Bush ilium especially in its lower part.

This greater thickness of the ilium (see fig. 2) posteriorly in *A. prometheus*, as compared with anthropoids, was attributed to its affording attachment to very strong posterior pelvic (deeper part of the long posterior sacro-iliac and sacro-tuberous) ligaments to oppose the upward tilting of the lower end of the sacrum resulting from the downward thrust of the body weight through the erect vertebral column upon the upper end of the sacrum. It was pointed

out that the significance of these strengthened posterior sacro-iliac and sacro-tuberous australopithecine ligaments lay not merely in their own

increased power but in the added strength thereby symbolized of the hamstrings and, more especially, of the gluteus maximus with whose

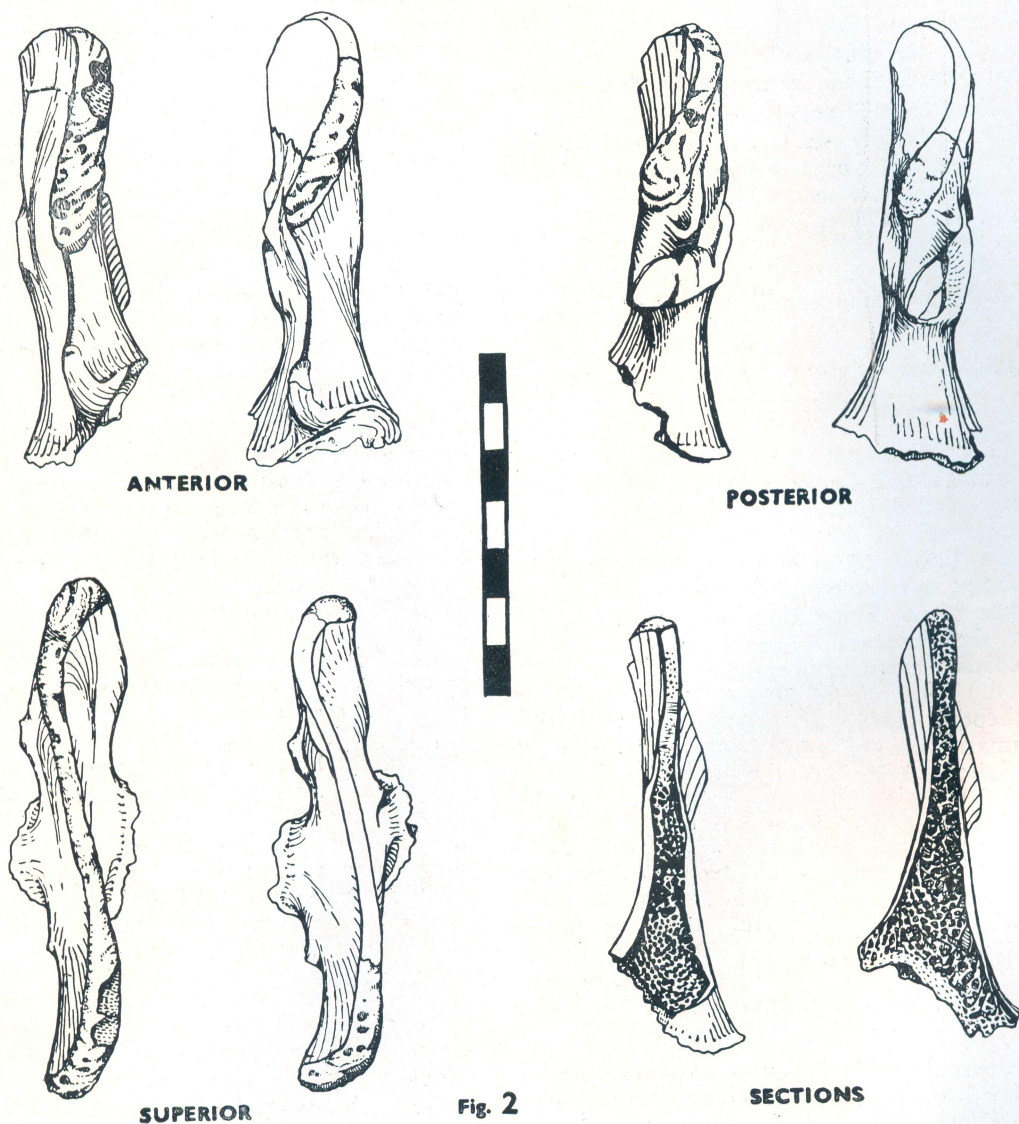


FIG. 2—The anterior, posterior and superior borders of the male (left) and female (right) adolescent australopithecine ilia respectively. For these views the ilia were oriented under the dioptograph so that the crests displayed their maximal lengths and their blades were as nearly vertical as possible. For the anterior and posterior corresponding orientations of the crest and blade were employed.

During manipulation the male ilium fell to the floor and broke almost vertically into two pieces. Advantage was taken of the accident to make a drawing of the sectioned ilium and to compare it with a Bush adolescent ilium sectioned correspondingly.

additional attachments these ligaments are so intimately concerned ;

6. that on the sacro-pelvic aspect in *A. prometheus* as compared with the chimpanzee
 - (i) the auricular surface had increased in size and complexity
 - (ii) the retro-auricular surface had become enormously increased
 - (iii) the pre- and post-auricular portions of the ilium are greatly expanded as in *Homo sapiens*.

The *retro-auricular* part of the sacro-pelvic surface, which is more than twice as large in *A. prometheus* as in the chimpanzee, is relatively smooth anteriorly but rugose posteriorly where it is furnished with a nipple-like elevation for the attachment of a very strong part of the posterior interosseous ligament between ilium and sacrum.

COMPARISON OF THE MALE AND FEMALE ADOLESCENT ILIA IN AUSTRALOPITHECUS PROMETHEUS

Figs. 1 and 2

GENERAL

The two bones are patently of similar (adolescent) age when the three-parts ilium, ischium and pubis) are as yet ununited at the acetabulum. The general features in which the two bones differ are the greater robusticity of the male (left side in figures 1 and 2) as compared with the lighter and more slender structure of the female (right side in figures 1 and 2). This is obvious from the greater width of the areas for future fusion with the epiphysis of the crest anteriorly and posteriorly in the male as compared with the female specimen. (see especially fig. 2).

The greatest maximum antero-posterior length 108 mm. of the male as compared with the female 102 mm. could conceivably be due to the former's being somewhat older, but is more probably a direct expression of divergence in size between the two sexes and also of the more pronounced volute moulding or sinuosity of the blade found in the female specimen. This is corroborated by the fact that the anterior-posterior

diameter of the shank of the ilium in the female 42 mm. is, if anything, greater if only by a millimetre than in the male 41 mm.

There is no fixed routine for comparing separated ilia; so, to exhibit the divergences between these two bones, I arranged for them to be drawn with the aid of dioptographic tracings, as in my earlier contribution from both the external (or gluteal) and internal (or sacro-pelvic) aspects (fig. 1) as they lay flat on the table. The drawings were then oriented, the sacro-pelvic aspect accurately and the gluteal aspect as nearly accurately as possible, on horizontal lines drawn from the tip of the anterior superior iliac spines and twenty degrees above lines from the same point and running tangentially to the inferior borders of the auricular articular surfaces of the ilia.

The advantage of this orientation is that, whereas the female (right side in figures) bone in fig. 1 assumes an orientation that appears approximately normal for its position in the body, the male (left side in figures) ilium appears as though the crest has been rotated backwards relatively to the acetabulum.

To offset this seeming distortion, which is actually due to the relative decrease in length of the anterior border of the male ilium the dioptographic tracings utilised in fig. 2 were made first from the superior aspect in such a way that the maximum antero-posterior length of the crests in both ilia was exposed and the blades of both ilia being set in as nearly vertical a position as possible. Then the anterior and posterior aspects of the bones were drawn with the crests maintained in the same type of orientation (fig. 2).

During these operations the male ilium sustained an accident and broke almost vertically through the acetabulum. Advantage was taken of the accident to add to this figure 2 a further drawing of the male australopithecine adolescent ilium in vertical section and to compare with it a Bush adolescent female ilium sectioned in similar fashion. The principal difference is seen to lie in the greater thickness of the compact bone both internally and externally in the australopithecine ilium.

GLUTEAL ASPECT

fig. 1

From this aspect it is apparent instantly that the distance from the inferior tip of the anterior superior iliac spine to the acetabulum in the female 40 mm. is greater than in the male 40 mm. The greater prominence in the male specimen of both the anterior superior and anterior inferior iliac spines (together with the relative diminution of the distance between these two landmarks indicated by the foregoing measurements) gives to the arcuate anterior border of the male ilium from this aspect deeper outline than in the female.

Unfortunately the male bone is damaged posteriorly in the acetabular region; but enough is present especially on the pelvic aspect to show, despite the loss of bone at the acetabulum, that the sciatic notch in the male specimen forms an angle considerably less obtuse than that of the female specimen. Further the bone is extended posteriorly in the female in such a way that the posterior inferior spine of the gluteal surface lies vertically below the posterior superior spine and not wholly in front of it, as occurs in the male specimen. In other words the distance between the lower margin of the posterior superior spine of the ilium and the acetabulum in the male circa 56 mm. has been decreased relatively to that in the female 63 mm. by an unknown amount but which appears to be about 7 mm.

This approximation of both the anterior and posterior superior iliac spines to the acetabulum produces a male ilium that is long antero-posteriorly and low supero-inferiorly as compared with that of the female. The divergence is such that the acetabular margin in the female lies 39 mm below a line running tangentially to the lower margins of the anterior superior and posterior superior iliac spines, whereas it lies only 28 mm. below the corresponding line in the male specimen. The height of the female iliac crest above this arbitrarily chosen tangent may not be as great as that indicated by the reconstructed part of the crest but it is unlikely to have been much less; if the reconstruction is right that height is only 2 mm. less than it is in the male specimen. The female adolescent ilium therefore differs from the male chiefly in its diminished antero-

posterior length and its increased supero-inferior height.

Four further features of the female ilium claim our attention from this aspect. All four arise from the stockiness of the male, as compared with the female ilium and the features expressing the consequentially more free modelling in the latter. In the male the general gluteal surface is relatively featureless apart from its anterior convexity and posterior concavity. In the female on the other hand there is a more pronounced supra-acetabular groove for the reflected head of the rectus femoris. Near the upper extremity of the blade there is also a definite grooving of the region below the iliac crest, that causes an outward flaring of the blade above it, such as is not found in the male specimen. In consequence the external convexity of the anterior half of the gluteal surface is more pronounced in the female than in the male and the external concavity of the posterior half is considerably deeper than in the male individual (compare the view from the superior aspect in fig. 2).

SACRO-PELVIC ASPECT

fig. 1

The chief difference from this aspect, apart from the divergences in shape already noted, is in the form and position of the auricular surface. Instead of being long and L-shaped (varying from 12 mm. broad posteriorly to 3 mm. broad in its vertical antero-superior part) as in the male, the female auricular surface is quite elliptical (20×16 sq. mm.) in projected outline. Yet, as the greatest length of the male auricular surface is only 22 mm., the total auricular area is little, if at all greater in the male than in the female. The female auricular surface has also been displaced relatively further posteriorly than in the male specimen. Hence the greatest distance from the anterior margin of the auricular surface to the anterior margin of the anterior superior iliac spine in the male specimen is 75 mm., whereas in the female it is fully 78 mm., suggesting thereby a relatively increased antero-posterior diameter of the female pelvis as compared with the male despite the increased total antero-posterior length of the male ilium as compared with that of the female.

From this aspect the posterior displacement of the auricular surface in the female is very apparent. The female sacro-iliac joint must be extremely dependent for strength on the relatively immense retro-auricular area thus provided for ligamentous attachment in preference to osseous contact. It is through the relative increase of this retro-auricular area that the human ilium has gained not only a massive area for the attachment of these ligaments but also a capacious site for the anchorage of the strong posterior lamella of lumbo-dorsal fascia and the powerful underlying sacro-spinalis musculature.

In this retro-auricular area in both the male and the female a nipple-like retro-auricular process and a slight ridge running anteriorly from it are present which appear to have served as the principal site of attachment of the interosseous sacro-iliac ligaments. Their presence is also characteristic of the Sterkfontein adult female ilium as well as of these two adolescent ilia from Makapansgat. This part of the bone is not preserved unfortunately in the male adult specimen from Swartkrans.

From this aspect it is manifest also how much deeper is the anterior concavity of the female ilium as compared with the shallower male specimen; but the more pronounced anterior inferior iliac spine in the male helps to emphasise somewhat the depth of the groove for the ilio psoas muscle in that sex.

ANTERIOR, POSTERIOR AND SUPERIOR ASPECTS

fig. 2

Our second figure comprises views of the two ilia from the anterior, posterior and superior aspects and also the comparative quasi-vertical sections through the ilia of the adolescent male *Australopithecus prometheus* and the Bush adolescent female A27 (stated in the catalogue to be fifteen years of age).

From the first 3 views of the ilia, the greater slenderness and sinuosity of the female australopithecine ilium is apparent. In the anterior views the increased incurving of the female anterior superior iliac spine and the relative abbreviation of the anterior border of the male bone are patent. Both male and female have prominent anterior

inferior iliac spines. The retention of the relatively longer anterior border by the female is a primitive feature, the increased incurving of the anterior iliac spine and therewith the greater inbending (concavity internally, convexity externally) of the whole anterior part of the female blade are advanced features as compared with the male.

This increased outward convexity coupled with the real outflaring of the iliac crest above and deepening of the depression for the reflected head of the rectus femoris below, are the features which give to the more delicate female ilium its characteristic form and modelling as seen from the anterior aspect.

In the posterior views the contrast between the stouter male and more slender female ilium is equally evident; but the female ilium is nevertheless extremely sturdy and exhibits from this aspect the same general features as were described for the male ilium in my previous paper (1949) save for the altered shape of the auricular surface.

In this view it should be particularly noted that the male blade is so flat and its posterior part so massive that very little of the gluteal aspect is visible in front of the posterior superior iliac spine and adjacent crest. In the female on the other hand there is visible laterally not only the whole outline of the gluteal surface and the sweep of the posterior gluteal concavity but also, because of the inward bending of the anterior superior iliac spine, its tip too can be seen projecting on the medial (pelvic) aspect.

The superior views corroborate from that aspect the features to which attention was drawn in describing the gluteal and sacro-pelvic aspects.

DISCUSSION

The Australopithecinae must have acquired the posture and gait distinctive of mankind for them to have developed innominate bones, and especially ilia, of the type found to be characteristic only of them and of living human beings. As Le Gros Clark (1954) summarised it "the remarkable fact is that the pelvic bones of the South African fossils all show these features [great relative breadth

of the iliac blade, the lengthening of the iliac crest for the more extensive attachment of the trunk muscles, so that they can be effectively used in upright walking, the rotation and downward shifting of the (sacro-iliac) joint through which the weight of the body is transferred to the lower limbs, the development of a very distinctive eminence (anterior inferior spine) marking the attachment of a powerful ligament which is required to stabilise the hip joint in the erect position and so forth] consistently; in other words the pelvis is constructed fundamentally on the hominid plan and it seems that this can mean only one thing—that the pelvis was adapted to the requirement of an erect, bipedal posture and gait”.

In their erect, bipedal posture and gait the Australopithecinae are human. Indeed Ernst Mayer (1950) clumps all the South African “man-ape” finds together as a single human species *Homo transvaalensis* saying “there is thus no definite chronological reasons why the South African ape-man could not be considered a possible ancestor of man”. According to him (*op. cit.*, 116) man “has speciated only once if our assumption is correct that never more than one species of man existed on the earth at any one time, the single event of speciation was the branching off of *Homo* from the anthropoid stock”.

The prime significance of these two ilia therefore is that they afford information about the sexual divergence in the pelvis of the human ancestral stock even during adolescence. In his recently published study of *The dentition of the Australopithecinae* Robinson (1956 : 153) found evidence of sexual dimorphism in the bimodality of the breadth dimension of the Swartkrans (*Paranthropus*) maxillary canines and first lower molars. One of those skulls in which the maxillary canine breadth fell into the feminine modal class had a sagittal crest; therefore it seems probable that both males and females of the *Paranthropus* type could have skulls with sagittal crests. In skulls of the *Australopithecus* type from Sterkfontein and Makapansgat it seems probable that only the large males had crests. In keeping with Robinson's impression that there was “a slightly greater degree of sexual dimorphism in the *Australopithecus* than in the

Paranthropus material”, these adolescent *Australopithecus prometheus* display ilia with distinctive divergences that are also attributable to sexual dimorphism.

In a recent paper on *The evolution of human ilium* Lois W. Mednick (1955) presented the results of studies on chimpanzee and human pelvis by means of the split-line technique, which showed that “in chimpanzee, the major tracts of split-lines are oriented from the sacro-iliac articulation to the ischial tuberosity and from the superior margin of the acetabulum to the iliac crest. This same orientation holds for the inner surface of the human bone.

“On the gluteal surface (outer) of the human ilium three distinct tracts of split-lines are discernible. The first is oriented between the anterior superior spine and the superior margin of the acetabulum. The second runs from the sacro-iliac articulation around the greater sciatic notch to the ischial tuberosity. The third and unique tract of split-lines begins immediately inferior to the iliac tubercle and runs downward to the posterior margin of the acetabulum.

“This column of split-lines running from the tubercle to the acetabulum corresponds to the thickened bone which lies in exactly the same region of the ilium. Whether examined by split-line or by thickness, the same structural pattern is apparent.

From these facts she argued (*op. cit.* p. 212) that “the australopithecines, lacking a well-developed iliac tubercle and pillar, could not balance as well as man. The inference is that they were still in the process of adapting to the orthograde progression... The australopithecines may represent a transitional stage of bipedal adaptation that never reached its culmination; or they may represent a stage that developed into man”.

When writing the description of the *A. prometheus* I noticed their similarities to the corresponding parts of the Bush adolescent ilium. On the way to New York that year to attend the 1949 Viking (Wenner-Gren) Foundation Seminar I visited Makerere College in Kampala and had the privileges of inspecting there through the kindness of Professor Alexander Galloway an adult female Pygmy skeleton which modified my opinion about the supposed distinctiveness

of the cristal *tubercle* and *buttress* in the adult *Homo sapiens* which had been based on ordinary European text book descriptions. To my astonishment this *adult* female Pygmy pelvis had ilia, which was also very flat and had a "cristal tubercle" little, if at all more prominent than the *Australopithecus*-male adolescent. Instead a diffuse thickening of the crest stretched from and including the anterior superior iliac spine for a distance of about 6 cm. Of this generalised thickening the "tubercle" region comprised the hinder 3 cm. and attained a thickness of only about 3-4 mm. in excess of the more anterior half of the cristal thickening. Further, owing to the general flattening of the pelvic basin or the relative failure of the anterior superior iliac spine to shift inwards and so to twist the anterior part of the crest (to which the sartorius and tensor fasciae latae are attached) as markedly as it is twisted in the Bantu Negro and even in the Bushman, there is in this adult Pygmy as in the adolescent *Australopithecus prometheus*, no appearance of a distant "buttress" or thickening of the Pygmy ilium below the "cristal tubercle" thickening to indicate that the Pygmy had a special strengthening of the crest to meet the stress of the pull of the tensor fasciae latae. Also we have in our departmental collection an adult Bush female pelvis A43 where the "tubercle" and "buttress" development is even less prominent than in the Makerere Pygmy female *adult*.

If, therefore, we were to adopt Mednick's reasoning about the australopithecine pelvis these Pygmy and Bush women "would not balance as well as man"; they would be "still in the process of adapting to the orthograde progression".

Finally, I must record that on re-examining the adult australopithecine innominate bones—through the courtesy of Dr. J. T. Robinson—from Sterkfontein I find that there is a prominent "pillar" of bone running between the crest and the acetabulum and an inturning of the anterior superior spine in the Sterkfontein female just as great as in the Bush female A43 and almost equivalent to that of the adult Pygmy. Further this adult female australopithecine ilium displays a far greater thickening or "pillar" of the ilium between the iliac crest and the acetabulum than is found in either the

Bush female A43 or the Makerere Pygmy female. As can be seen in the sections drawn here (fig. 2) the height and width of the supra-acetabular region in the Bush and Australopithecine adolescent ilia are very similar; the main difference, as already noted is that the stratum of compact bone on both the pelvic and gluteal aspects is thicker in *Australopithecus* than in the Bush juvenile. Similarly in the adults, whereas the Bush and Pygmy female ilia vary from a thickness of circa 3-5 mm. at the anterior border to circa 10 mm. in the supra-acetabular "pillar" or "buttress" behind it, the Australopithecine adult female from Sterkfontein varies from a thickness of circa 3.5 mm. at the anterior border to circa 13 mm. at the supra-acetabular "pillar" or "buttress" behind it. So "the third and unique tract of split-lines which begins immediately inferior to the iliac tubercle and runs downwards to the posterior margin of the acetabulum" in mankind is equally characteristic of the Australopithecinae of Makapansgat and Sterkfontein, whether their presence is tested by bone thickening or by actual splitting. For in addition to the thickening of the supra-acetabular compact stratum (especially on the gluteal aspect) seen in the sectioned male adolescent australopithecine ilium, there are apparent in both the male and the female adolescent australopithecine ilia, especially marked in the female, numerous fine and even coarse split-lines (some of which have been indicated by the artist Miss. de Wet in fig. 1) whose source below the iliac crest and destination about the posterior margin of the acetabulum is unmistakable.

Unfortunately, owing to the adolescence of the two Makapansgat ilia and the damage suffered by both the Sterkfontein and the Swartkrans adult iliac crests we know nothing about whether true tubercle are or are not present on the australopithecine adult iliac crest; but in view of their absence from some Bush adolescent ilia and their virtual absence from some adult Bush and Pygmy female iliac crests the presence or absence of tubercles in adult australopithecine can have little bearing on the degree of adaptation of the Australopithecinae to orthograde progression.

In this connection it is fundamental to recall Adolph H. Schulz's (1955 : 99) foot-

note to his important paper on "*The position of the occipital condyles and of the face relative to the skull base in primates*". He expressed there his inability "to understand how any creature can be 'nearly upright' in the manner in which Neanderthal man has sometimes been reconstructed with his trunk leaning forward and taking a long step in order to prevent his falling. Such a posture, in which the center of gravity lies well in front of the center of support, is never maintained by any child learning to walk nor by any ape standing on its hind legs. Even in the beginning stages of upright posture the trunk must already have been held *fully* erect, to be most easily balanced, but this bipedal posture changed only gradually from an occasional attempt to a constant habit".

The principal recent contribution made (Dart 1947) to the understanding of bodily posture and steatopygy in Bushmen was my recognition that their *proptotic* character was an expression of constitutional infantilism. I pointed out that many investigations carried out by Wells (1931) on the foot, by Orford (1934) on the pelvis, by Laing and Gear (1929) on the vertebral column and by others working in the Department of Anatomy in this University had demonstrated primitive or Neanderthaloid features in the Bushman type; that in no aspect of Bush structure were these features more apparent than in the *proptotic* or infantile posture of their bodies whether standing, running or using weapons; and that, in this sense, "they are incompletely erect".

Presumably it is in this sense also that when Le Gros Clark (1955 : 26) recognised certain features in which some of the australopithecine innominative bones so far known may differ from those of *Homo sapiens* (insofar as this bone has been described hitherto) and presumed "that these fossil hominids had not developed to erect posture to the degree of perfection found in modern man", for he also asserted "that the Australopithecinae had acquired the erect posture and gait distinctive of the family Hominidae".

At any rate it is obvious from these juvenile ilia that the adolescents of *Australopithecus*

prometheus, both male and female, simulate in their iliac structure *Homo sapiens*, especially some specimens of the Bush and Pygmy variety, so closely that this type of Australopithecine must have changed its bipedal posture from an occasional attempt to as constant a habit as Bushmen and Pygmies display in a state of nature today.

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