

the differences being almost entirely of the sort shown to be variable within a single population by the sample of nearly 200 specimens of *Paranthropus* now in the collections of the Transvaal Museum. The chief feature of the Olduvai form which does not fall within the observed range of variation of this collection is size. The best size comparison is with the only male specimen with good teeth which has P^3-M^1 preserved in sequence and is of the same dental age as the Olduvai specimen. The latter is only 8.4 per cent larger. The average percentage difference for five skull and dental series dimensions compared to those of a fully adult female skull is 17.4 per cent. As Schultz has shown in a number of papers, intra-specific variation in measurable primate anatomical characters can often greatly exceed the above values.

The validity of separate specific status is not clear on the basis of the single specimen, and it is perhaps wisest to leave it as distinct. In the light of the above analysis, however, separate generic status seems unwarranted and biologically unmeaningful. I therefore propose that the name of the Olduvai form be *Paranthropus boisei* (Leakey).

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¹ *Nature*, 184, 491 (1959).

THE exact taxonomic label that should be applied to the skull that I have named *Zinjanthropus*, from Olduvai, and which I described in *Nature* of August 15, 1959, seems to me relatively unimportant at the moment. Inevitably, different scientific workers have different ideas of what characters justify specific, generic, and even superfamilial rank. After all, this is purely a question of artificial labels.

Dr. Robinson and I agree that *Zinjanthropus boisei* is closely related to the Australopithecinae; we agree that it has certain resemblances to *Paranthropus*, and we disagree mainly in that he believes the differences to be insufficient to justify separate generic rank, while I think they do.

It is hard enough to reach agreement among zoologists on the taxonomic status of living primates, under conditions in which we possess the skull, skeleton, skin and viscera for study, and it will always be much more difficult to do so when we have only fossils to guide us. I can only say that the very considerable additional work that I have done on the *Zinjanthropus* skull since my preliminary report in *Nature* has greatly strengthened my view that it is entirely different from *Australopithecus* and *Paranthropus*, differing from both these genera more than they do from each other.

I do not feel that any useful purpose would be served by entering into a long discussion with Dr. Robinson in *Nature* at present, since the more detailed study of the Olduvai skull which is now in hand will not, I hope, be too long delayed. However, Dr. Robinson makes certain statements which may mislead those who read them, unless I comment on them. I will therefore do so as briefly as possible.

First of all, whereas in *Paranthropus* and *Australopithecus* (as Dr. Robinson says) the external occipital protuberance lies more or less on the Frankfort plane, in *Zinjanthropus* it lies below it.

Robinson's description of the brain case of *Paranthropus* as "almost spheroidal", but also "relatively low and narrow anteriorly but steep-sided and higher

posteriorly", does not seem to make sense, for the two statements seem to cancel each other out. In any event, such a combined description does not fit the brain case of *Zinjanthropus*.

Robinson illustrates the range of the tympanic plate (see in profile), in *Paranthropus*. None of these three illustrations closely resembles the tympanic plate of *Zinjanthropus*, although the one to the left appears to be rather closer than the middle one.

Without knowing the points at which Robinson measures inter-orbital width and external orbital width, I cannot comment upon his comparisons of his *Paranthropus* figures with mine for *Zinjanthropus*.

As to the morphology of the palate, I do not know upon what evidence Robinson is basing his statement, since I have published no measurements of the palatal depth in *Zinjanthropus*. I must repeat, however, quite categorically, that the morphology of the *Zinjanthropus* palate in no way resembles that of *Paranthropus*.

I cannot accept Robinson's statement that the zygomatic process of the maxilla in *Zinjanthropus* is "relatively poorly developed"; I would say rather, as I have said before, that it is developed in an entirely different morphological manner from *Paranthropus*.

As regards the position of the sagittal crest, in *Zinjanthropus* it ceases to be a crest and divides into two temporal lines well behind the line drawn vertically through the ear when the skull is on the Frankfort plane. In *Paranthropus* (in all the published photographs), the sagittal crest extends a long way forward of such a vertical line through the ear when the skull is on the Frankfort plane, and it is therefore wrong to say, as Robinson does, that "the crest occupies a position identical to that in *Paranthropus*".

Finally, I do not understand the significance of a comparison of "the ratio between the modules of these two teeth", that is, the canine and P^3 . Robinson has defined a module as the sum of the length and breadth of a tooth divided by two, and I am at a complete loss to understand how the ratios of modules can have any significance. It must be obvious that one can have on one hand a canine tooth 16 mm. long and 6 mm. wide (module equals 11), and a premolar 9 mm. long and 7 mm. wide (module equals 8), while in another specimen one could have a canine which measured 11 mm. \times 11 mm., and a premolar which was only 5 mm. long and 11 mm. wide, yet the ratio of the modules in the two sets of teeth would be identical, but completely without significance.

In any event, the ratio between the canine and the premolar alone cannot have any bearing upon the relation of the canine size to the total molar-premolar series, unless the premolar bears a constant relation to the total post canine series.

I therefore repeat my statement that in *Zinjanthropus* there is a relatively greater reduction of the canines in comparison with the total molar-premolar series than is seen in *Paranthropus*, and maintain that Robinson has in no way disproved this statement.

I agree with Robinson that we need to study the *Australopithecus* skull structure and dentition in terms of diet and mode of life, and I shall certainly do so as far as *Zinjanthropus* is concerned in my fuller report.

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