

scientists, restorations have been built around their fragments and are now on view in the biggest museums, and lengthy discourses on the positions of these two extinct human or humanoid species have been spoken in scientific meetings and printed in the literature of science.

All this, Mr. Miller is convinced, is most unseemly and premature. In the first place, he points out, there is only one specimen of each kind,—a very imperfect specimen at that. But it is well known to all anthropologists that the skeletons of both man and the great apes vary so much from individual to individual that we must have many complete specimens before we can safely venture on drawing general conclusions. The great differences that can exist even between brothers are proverbial. Yet many scientists have not hesitated to base the most sweeping generalizations on single imperfect specimens when it comes to early man. Mr. Miller feels that they should resist this impulse, entirely natural though it may be, and patiently hunt for more material before they try to tell us all about *Pithecanthropus* or *Eoanthropus*, or set up their statues in museums.

Furthermore, he continues, skull tops are not at all the most important things to have as bases for the reconstruction of fossil species, whether human or ape. Skull-tops of large apes can be astonishingly human in their outlines. Neither do teeth help greatly, especially molar teeth. It is almost impossible to distinguish with certainty between some ape teeth and some teeth from human jaws.

Over-Sanguine?

The thigh-bone of the Java Ape-man is undoubtedly human; but is it really the thigh-bone of the Java Ape-Man? It was found at some distance from the skull, and there is a definite possibility that the two bones did not come from the same creature at all. Similarly, the strongly ape-like lower jaw usually associated with the skull of the Dawn-Man of Piltdown, England, may not have belonged to that skull at all. In calling attention to these possibilities, Mr. Miller is only raising anew the objections that other scientists have advanced in the past to what they have regarded as the over-sanguine views of their associates.

What we really need to establish the nature of these doubted skulls, Mr. Miller holds, is their basal portions. These would tell us decisively how man-like

or how ape-like the two early human or pre-human races were. One of the things that sets man and the apes most sharply apart is the position of the big hole in the base of the skull through which the spinal cord passes. In man, this opening is well forward, and the skull balances on the end of the spinal column like a basket of laundry on a Negro wash-lady's head. In all the apes and monkeys, on the other hand, the opening is away aft, and the skull does not balance, but juts forward and is held up by the pull of powerful muscles in the back of the neck and on the shoulders. Until we can find the bases of the skulls of Ape-Man and of Dawn-Man, we shall not know definitely their places in the animal kingdom.

Pelvis Also Important

Another bone, or group of bones, necessary for establishing the correct zoological status of any supposedly human fossil, according to Mr. Miller, is the pelvis. This is the irregular ring of bone at the base of the trunk, attached to the spine and in turn serving as attachment-point for the legs and as partial support for the vital organs in the abdomen. In upright-walking man, the legs are extended in the same direction as the spine itself, instead of being at right angles to it as in the ancestral quadruped pattern; and it is to give efficient leverage to the leg muscles in this new and "unnatural" position that

the pelvis has had to become profoundly modified. Furthermore, since it now has to bear all of the body weight instead of only half of it, as in the quadrupeds, it must be solidly constructed. In the apes and monkeys it is narrower and not so rigidly built, because these animals are not primarily leg-walkers. Even the least arboreal of them goes on all fours more than he does on his hind legs. For these and other reasons, there is a great difference between the pelvic bone structure of man and the apes, which no anatomist could escape noticing. So Mr. Miller demands, not the head of primitive man, but his pelvis.

There is a third striking difference between man and all the apes, though Mr. Miller stresses this rather less than he does the skull-base and pelvis differences. This is the position of the big toe. Man's foot is built for walking on flat surfaces, and the big toe is its principal lifting lever for the last thrust of each step. It is in the position of greatest efficiency for delivering that thrust—pointing straight forward. The feet of apes, on the contrary, are climbing feet, and their big toes are their principal grasping organs, pointing sidewise at a considerable angle. Even when he is walking erect the ape is unable to line up his big toe; it continues to point sidewise.

Until paleontologists are able to dig up the bases of the earliest skulls and the pelvises that go with them, therefore, Mr. Miller believes students of evolution should venture opinions only very conservatively. And he'd like to have a few big toes as well.

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MEDICINE

Lower Tuberculosis Deathrate For 1934

A LARGE reduction in the tuberculosis deathrate during 1934 is foreseen by statisticians of the Metropolitan Life Insurance Company who have been studying the mortality figures for the first quarter of the year. They expect the deathrate from this disease among the industrial population to run about 60 per 100,000 for this year. For the first quarter of the year the rate among insured white persons was 51.2 per 100,000, a "remarkably low figure."

Science News Letter, May 19, 1934



MIGHT BE IN VAUDEVILLE

The long-nosed monkeys are of "average" size for primates, and have faces like human caricatures