News of Science

Power of Radar Increased

The U.S. Air Force and Columbia University have announced the development of new techniques that increase the power of radar in "extremely large, effective amounts." At a press conference John R. Dunning, dean of the Columbia School of Engineering, described the increased effectiveness as "many hundreds of times" by comparison with World War II radars. Dunning also called the work "probably the greatest single advance in radar work since the start of World War II."

The 3-year research project was carried out in the Electronics Research Laboratories at Columbia under an Air Force research contract. The sponsoring agency was the Rome, N.Y., Air Development Center of the Air Research and Development Command.

The new techniques do not actually increase the power used, but instead employ a method of "signal enhancement" which raises the strength of a radar signal reflected from an aircraft or a missile "to an unprecedentedly high level." This has particular significance for radar installations in regions like the Arctic, where it is extremely difficult to supply fuel and other facilities for producing large amounts of power.

Oreopithecus bambolii

In June of this year, I spent the better part of a week in Basel, Switzerland, studying the specimens of *Oreopithecus bambolii* which Johannes Hürzeler has assembled at the Natural History Museum from various European collections.

Oreopithecus is a fossil catarrhine or Old World pithecoid primate from the Pontian (Upper Miocene or Lower Pliocene) of Tuscany, Italy, roughly some 10 million years in age. It is a highly controversial creature which has given rise to diverse interpretations since Gervais first described the type specimen, a mandible with teeth, in 1872 [*Compt. rend. Acad. Sci.* **74** (1872)]. Some authors have regarded it as a peculiar anthropoid ape, others as an aberrant cercopithecoid or Old World monkey, and still others as a sort of *forme de passage* or link between the two preceding groups. Majority opinion, however, labeled it a cercopithecoid of some sort. There the matter rested until 1954, when Hürzeler [*Verhandl. naturforsch. Ges. Basel* 65, 88 (1954)] rescued *Oreopithecus* from paleontological oblivion by the startling claim, based on detailed study of the dentition, that this animal actually is not only a hominoid—that is, a member of the taxonomic group that includes the pongids (anthropoid apes) and hominids (man and his immediate forerunners)—but, more precisely, a primitive hominid and hence a representative of the specific evolutionary line that led to man.

The material which Hürzeler has brought together at Basel comprises the remains of at least 50 different individuals. Although teeth and jaws predominate, some important parts of the skeleton of both the trunk and the limbs are included.

The dentition of *Oreopithecus* is not, as is often claimed, of a cercopithecoid type. Indeed, it is typically hominoid, although of a generalized nature. Moreover, it is not pongid; rather, it exhibits a number of characters which can be regarded only as hominid.

Knowledge of the skull is as yet incomplete. Even so, the known portions of cranium and jaws exhibit features which suggest that the skull of *Oreopithecus* was hominid, rather than pongid, in pattern.

The available limb bones or fragments thereof (especially the proximal part of an ulna, some hand bones, and the major portion of a foot which has not yet been completely freed from its matrix) appear to be those of a hominoid more generalized in limb structure than existing pongids. In some characters they are, in fact, hominid. In other characters, the resemblance is closer to cercopithecoids than to pongids; such characters are best interpreted as generalized catarrhine ones. The present picture of the extremities, although admittedly quite fragmentary, is by no means incompatible with what might be expected in an early hominid.

Portions of the vertebral column of two animals have been recovered: (i) parts of the last three lumbar (of which the two more caudal ones are largely complete) and the first two sacral vertebrae (the second of which is fragmentary), and (ii) most of the sacrum. These are distinctly hominoid, and in no manner cercopithecoid. Indeed—startling though this suggestion may seem to be—the lumbar vertebrae are so relatively large and robust as not to exclude the possibility that *Oreopithecus* was capable of walking upright! On the other hand, their massiveness may be in the nature of a preadaptation.

It appears that the most reasonable interpretation of the available *Oreopithecus* material is that this animal not only is a hominoid but actually belongs to the hominid line of that evolutionary radiation. There is no good reason for regarding *Oreopithecus* as a pongid of any sort. Nor is it any sort of cercopithecoid, aberrant or otherwise, as has again, recently, been claimed by Remane [*Akad. Wiss. u. Lit., Mainz, Abt. Math.-naturw. Kl.*, 469 (1955); *Primatologia* **1**, 267 (Basel, 1956)] and von Koenigswald [*Riv. Sci. Preist.* **10**, 1 (1955)]—an interpretation to which Robinson is also inclined [*The Dentition of the Australopithecinae* (Pretoria, 1956)]. These writers have considered only the teeth; yet Hürzeler has made it clear that even the teeth are not truly cercopithecoid in pattern.

Although *Oreopithecus* is, in the present state of our knowledge, best classified as a hominid, there is, of course, no way of knowing whether it represents a form directly on the line leading to man, for the hominid line of evolution, like other vertebrate lines, quite likely produced more than one branch. In any event, this in no way decreases the probable significance of *Oreopithecus*; for, if the foregoing assessment of its zoological affinities is valid, this Tuscan primate represents our first glimpse of a Tertiary hominid of any sort. One cannot, naturally, overlook the possibility that *Oreopithecus* is a representative of some hitherto unknown line or radiation of Old World primate evolution quite independent of the hominid, pongid, and cercopithecoid lines. This interpretation is unwarranted, however, on the basis of existing evidence and, hence, on the principle of parsimony.

In this evaluation of the status of *Oreopithecus,* I am in essential agreement with Hürzeler [1954; also *Problèmes Actuels de Paléontologie* (Paris, 1956), pp. 115–121] and also with Heberer [*Primatologia* **1**, 379 (Basel, 1956); also see de Terra, *Science* **124**, 1282 (1956)]. A detailed description of the *Oreopithecus* material is being prepared by Hürzeler.

A lignite mine at Baccinello (Gros-