

tific community for thorough analyses, the material appears to be what was expected: ejecta blanket from Mare Imbrium.

From the upcoming Hadley/Apen-  
nine site, scientists hope to get samples  
of a rille, of basin fill, of volcanic  
features and of secondary craters. Most  
important, however, would be samples  
of the Apennine Mountain front itself,  
which could date the event that formed  
the Imbrium basin and created the  
mountains. The cream would be Pre-  
Imbrian samples, exposed by a fault  
that formed the Apennine Mountain  
escarpment.

If the Fra Mauro and Apennine sites  
do not yield the oldest lunar material,  
another gap will be left. And scientists  
would like to land at the sites of very  
young events both in the maria and the  
highlands, as well as in areas that look  
volcanic.

Marius Hills and Littrow could fill  
out the picture of the maria, since they  
are both young sites (after maria flood-  
ing). Marius Hills, northwest of the  
crater, has a series of domes and cones.  
It is in Oceanus Procellarum. The  
domes and cones are on a plateau atop  
a major ridge system that runs for  
about 1,200 miles. Some features of  
the site appear volcanic.

Littrow, on the southeast edge of the  
Serenitatis basin, is covered with some  
of the darkest and perhaps youngest  
material on the moon. In addition it  
has young-looking ridges of wrinkled  
or ropy features.

Tycho crater is alluring (SN: 9/19/  
70, p. 247) because it is probably the  
youngest major impact crater on the  
moon and is in the oldest area.

**The sites** in or near the central  
highlands could possibly yield very old  
material, plus other information. The  
Davy crater chain is northwest of the  
crater Alphonsus on the western side  
of the central highlands. This puzzling  
chain of 30 small craters extends about  
40 miles (some believe the chain is of  
volcanic origin). Nearly half the craters  
are on the floor of Davy Y itself. Some  
think these chain craters resemble dia-  
tremes on earth—vents from deep-  
seated material.

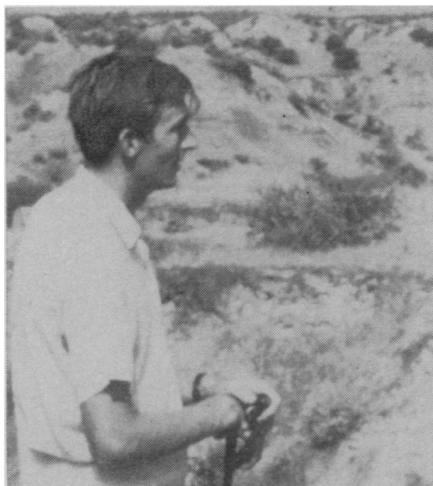
The Descartes site is also in the cen-  
tral highlands near the apex of the  
largest topographic feature on the  
moon. The site could contain several  
events of Imbrian origin, but pools of  
highland filling are also an attraction.  
The landing site, between two bright  
halo craters, would afford samples of  
these upwelling pools. It would also  
perhaps allow samples of Imbrian  
structure, of mare material and of hilly,  
grooved and furrowed material.

Alphonsus, the dark horse site, is  
on the west side of the highlands bor-  
dering on Mare Nubium and south of

Davy chain. A ridge dissects the crater  
bottom. On the ridge is a mound, or  
small mountain. On the "floor" of the  
crater are dark halo craters and rilles.  
On the ledges of the rim of the crater  
can be seen dark areas that could be  
lava pools. Cutting across part of the  
crater rim is material from Mare Im-  
brium.

#### LAKE RUDOLF FOSSILS

### Two distinct hominids?



National Geographic Society

Richard Leakey: Sorting out the past.

A decade ago anthropologist Louis  
S. B. Leakey and his wife Mary dis-  
covered at Olduvai Gorge in Tanzania  
the skull of what was believed to be  
the world's earliest antecedent to true  
man. This ape-like creature, *Australo-  
pithecus*, lived in Africa almost 2 mil-  
lion years ago. The find by the Leakeys  
was a monumental step in the search  
for man's past.

**Following** in the footsteps of his  
famed parents, Richard E. F. Leakey  
is making equally important contribu-  
tions to the history of early man. In  
1969 he discovered on the eastern  
shore of Lake Rudolf in Kenya an  
*Australopithecus* skull believed to be  
850,000 years older than the one found  
by his parents. This and his subsequent  
finds in 1970 have pushed the history of  
early man back to at least 4 million  
years. Another find in the Lake Rudolf  
area, reported earlier this year, has ex-  
tended the date for *Australopithecus*  
back to 5.5 million years (SN: 2/27/  
71, p. 141).

In the May 28 NATURE Richard  
Leakey describes 16 hominid specimens  
(skulls and limbs) and "the view that  
two distinct hominids—*Australopithe-  
cus* and *Homo*—lived contemporane-  
ously in the Lower Pleistocene" in the  
Lake Rudolf area of East Africa.

Previously, researchers have con-  
cluded that there were two forms of  
*Australopithecus*, robust and gracile,

A NASA announcement of the Apollo  
16 site is expected within the next few  
weeks. More than likely the decision  
will go to Descartes. Then if Hadley/  
Apennine does not yield the oldest ma-  
terial, Alphonsus could be the com-  
promise Apollo 17 site. Some bets,  
however, are being placed on Marius  
Hills. □

and that the gracile form was ancestor-  
al to *Homo* in the Lower Pleistocene.  
Richard Leakey, basing his conclusions  
on East Rudolf specimens, feels that  
this concept "requires careful reexamin-  
ation." Three specimens of *Homo* were  
taken from levels that also yielded both  
sizes of *Australopithecus*—indicating,  
he says, that they existed at the same  
time. Leakey further points out that  
the two types or sizes of *Australopithe-  
cus* may actually be different sexes of  
the same species. This sexual dimor-  
phism is especially obvious in large  
primates such as gorillas, chimps and  
baboons.

**If the two sizes** of australopithecine  
are actually the same species, and if  
they did live at the same time as *Homo*,  
there is little probability that *Austra-  
lopithecus* was ancestor to *Homo*. This  
theory, however, has not been widely  
accepted. Other workers in the field  
point out that some sites have yielded  
only one type or size. They feel it is  
unlikely that only one sex would be  
preserved at these sites.

These theories are based on cranial  
material—the relative sizes of the skulls  
and teeth. Leakey, however, also has  
postcranial material to show that *Homo*  
and *Australopithecus* are two "quite  
separate and distinct early Pleistocene  
hominids." Detailed study of the bone  
fragments, with particular emphasis on  
functional aspects, should help answer  
some of the taxonomic questions. So  
far, the specimens do seem to repre-  
sent two distinct forms. Those attri-  
buted to *Homo* indicate an upright  
bipedal hominid. The rest, presumably  
*Australopithecus*, suggest a form of lo-  
comotion that was not entirely upright  
or bipedal. "The Rudolf australopithe-  
cines," explains Leakey, "may have  
been close to the 'knuckle-walkers' con-  
dition, not unlike the extant African  
apes."

As research continues on the Rudolf  
finds (two other studies on the East  
Rudolf Basin appear in the same issue  
of NATURE) Leakey's hypotheses may  
or may not be proved. But his work  
and his finds, like those of his parents,  
are important and will eventually lead  
to a fuller knowledge of man's early  
history. □