The occurrence of complementary isolates within a particular territory could result in genetic variation of the organism and possible changes in its pathogenicity. Varieties of *Theobroma cacao* now being bred for resistance and tolerance to black-pod disease will need more extensive testing in areas where the pathogen is variable than may be necessary in Ghana, where it appears to be uniform. The variability of the organism must also be recognized when conducting bio-assays of fungicides to be used in chemical control of the disease in the field.

Further investigations are proceeding, and a fuller account of the work will be published elsewhere.

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ANATOMY

A Reconstruction of the Foot of the 'Abominable Snowman'

THE clearness of the tracks of the 'Snowman' shown in the photograph taken by Eric Shipton[1] (Fig. 1) has enabled me to make a reconstruction of its foot (Fig. 2). This has been used to produce imprints in snow which show a great similarity to the natural tracks (Figs. 1 and 3), suggesting that the model is accurate.

The plaster foot has the following anatomical peculiarities: (1) It is of great size: length 12½ in., fore breadth 7½ in., the width thus being 60 per cent of the length. The heel is 6½ in. broad—nearly as broad as the fore part of the sole. (2) The hallux is very thick and separated from other toes. (3) The second is the longest toe, and it is separated from the hallux and third toe; it is thinner than the hallux though more powerful than the other toes. (4) The third, fourth and fifth toes are small and united towards their bases, although the distal end of each toe gives a clear impression in the snow. The little toe is less bent than the others.

These features can be seen to a lesser degree in human and gorilla feet, and by comparing them certain inferences can be made.

(1) The 'Snowman' foot is as long as that of a large gorilla but much broader. Sir Arthur Keith[2] emphasized the increase of the tarsal, and decrease of the digital, elements of the skeleton of the foot during the evolution of higher primates. In the foot of the gorilla, the tarsal elements account for 39 per cent of the length measured along the third digit; in the human foot, it accounts for 52 per cent. At the same time, describing the soft tissues of sole, Keith states: "we see the enormous increase of the heel in the gorilla; it is relatively and absolutely larger than the heel area of man". Fig. 4 shows this huge foot and it can be seen that it resembles the much larger heel of the Snowman. This may equally be regarded as a combination of the hominoid tendency towards increasing length and breadth of tarsal bones together with gorilloid tendency for a spread of the soft tissues. The great fore breadth (42·8 per cent of the length) is found also in the skeleton of the foot of the neanderthaloid from the Kiik Koba cave in the Crimea[3].

(2) The hallux of the 'Snowman' resembles that of the gorilla, except that it is straighter, longer and much more powerful. In conjunction with the depth of the impression made in the snow, this suggests that it carried much of the weight of the body. But at the same time the hallux has every appearance of being opposable, and could be used to grasp objects or in climbing. The first row of foot bones is shortest because of a very shortened metatarsal element, although the phalanges themselves are big. R. Neuhaus[4] and H. Virchow[5] call such cases in human foot (Fig. 5) "zurücktretende" hallux and they appear, as in the 'Snowman', to be due to an unusually short metatarsal bone.

(3) The unusually large size of the second toe of the 'Snowman' can be also compared with the human foot with "zurücktretende" hallux. This type of big toe can be accompanied with an elongated and thickened second toe (Fig. 5). H. Klaatsch[6] has described a similar case in an Australian aborigine, who possessed the same type of foot which was able to grasp much better than normal. This is the same combination of shortened first and elongated second axis both in the foot of the 'Snowman' and in an abnormal human foot.

These peculiarities can be explained functionally. The hallux is shortened and capable of grasping, but

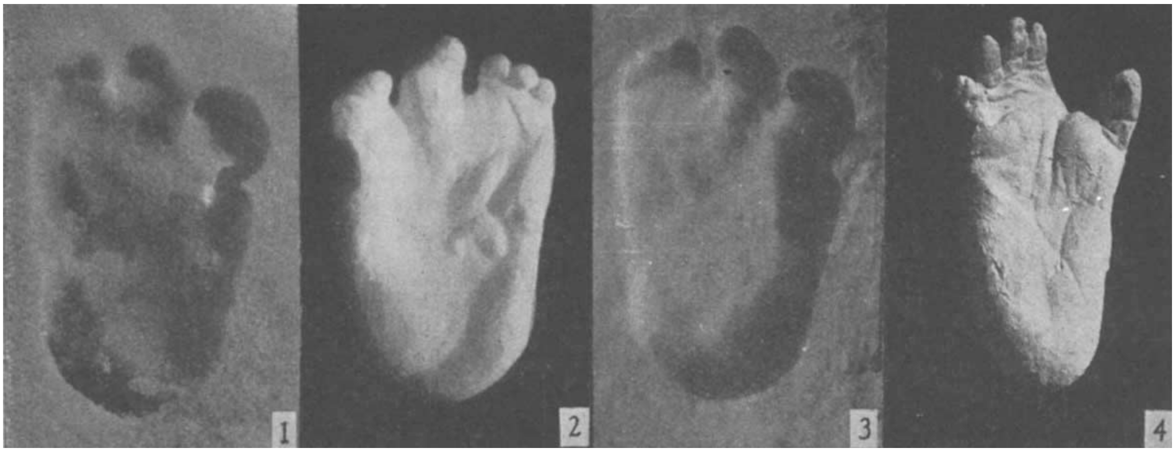

Fig. 1. The original track of the 'Snowman' (after Shipton). Copyright: The Mount Everest Foundation
Fig. 2. The reconstructed foot of the 'Snowman'
Fig. 3. Artificial track made with the reconstructed foot
Fig. 4. Plaster cast of a gorilla's foot

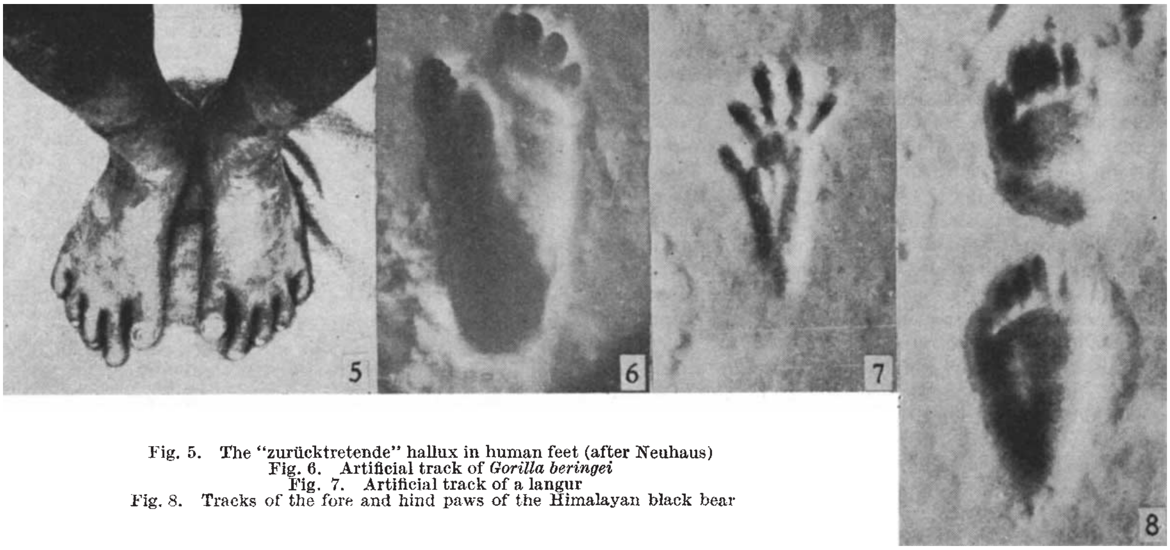

Fig. 5. The "zurücktretende" hallux in human feet (after Neuhaus)
Fig. 6. Artificial track of *Gorilla beringei*
Fig. 7. Artificial track of a langur
Fig. 8. Tracks of the fore and hind paws of the Himalayan black bear

less effective for use in walking upright. The second toe is therefore also involved in balancing and is elongated and thickened. This type of foot with its dual functions of grasping and balancing was probably characteristic of early prehominids in the first stages of the bipedal mode of life.

(4) The relative shortness of digits 3, 4 and 5 and their corresponding metatarsals are an obvious feature of the human foot. Also all three lateral toes of the 'Snowman' seem to show signs of partial syndactyly, but metatarsals 3–5 do not show any signs of the shortening which is observed in the human foot. The two distal phalanges of the little toe in the human foot are often fused together, and this condition may also explain the faintness of the impression made by the little toe of the foot of the 'Snowman', which we must suppose was held straighter than the others.

The impressions made by plaster casts of the feet of the mountain gorilla (Fig. 6), langur (Fig. 7) and the tracks from the preserved feet of black bear (Fig. 8) show that the footprint of the 'Snowman' is much like that of the gorilla and very different from the other two. Yet it has been suggested that Shipton's photograph was a footprint of either a bear or langur.

Other criticisms that the footprint of the 'Snowman' was deformed by the melting of the snow do not seem well founded, in view of the sharpness of the imprint and the similarity to the fresh artificial prints from the plaster model.

Hans Gross[7] mentions that good photographs of the tracks in the snow show even more details than do a plaster cast made from such tracks. But since heel and toes press more deeply into the snow than the sole, the arch of the foot is exaggerated and the impression is slightly shorter than the actual foot.

G. W. Gayer[8] stressed that the deepest impressions of human tracks are : the outer side of the back of the heel and on the inner side the big toe, and slightly less the outer side of the sole behind the little toe and the inner side behind the hallux. These details are well known from criminological studies and are very clearly seen in the tracks and plaster cast of the 'Snowman'.

In the original photograph it is also possible to see small heaps of snow thrown up by the back of the heel when it first touched the snow surface and was later pressed down by the flat of the heel, which is, according to Gayer, characteristic of the track of a bare human foot. This suggests that the track of the 'Snowman' was formed in the same way as a human one and that the 'Snowman' must walk in a human manner.

All the evidence therefore suggests that the so-called 'Snowman' is a very huge, heavily built bipedal primate, most probably of a similar type to the fossil *Gigantopithecus*.

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CYTOLOGY

Chromosomes of *Gyraulus circumstratius*, a Freshwater Snail

Polyploidy is relatively scarce in the animal kingdom, and is apparently almost entirely confined to those species in which reproduction is parthenogenetic, hermaphroditic or clonal[1]. Such animals usually do not have a heterogametous sex-determining mechanism to be disturbed by polyploidy. The hermaphroditic nature of freshwater pulmonate snails and their ability for self-fertilization[2] suggest the possibility that there might be a considerable degree of polyploidy among the large number of species of this group because a single accidental polyploid individual could give rise by self-fertilization to a polyploid strain, rather than producing only sterile triploids, if cross-fertilization were obligatory[3]. So far there has been little reliable evidence for polyploidy in aquatic pulmonate snails. (An earlier indication