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Author(s): LOREN C. EISELEY

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Missing Link or Hybrid—Which?

LOREN C. EISELEY

FOR thousands of years one of the most amazing chapters in the story of prehistoric man was guarded, jealously enough, in the very heart of the Holy Land. Unsuspected by scientists until little more than a decade ago, a strange and startling assortment of human fossils lay hidden in small limestone caves in Palestine, not far from Jerusalem. Then prying eyes found them out and interest in the “missing link” story took a new spurt, for here was that rarest of archaeological discoveries, a transition form, a “missing link,” connecting our living species of man with his remote progenitors.

Now, since that day in the early nineties when Dr. Eugene Dubois announced the discovery in Java of “a great man-like mammal” (*Pithecanthropus erectus*) which he considered “as a link connecting apes and man,” the term “missing link” has been bandied about as an epithet horrifying to some, a source of confusion to others, and a phrase altogether too popular and attractive to be particularly pleasing to the careful scientist. By the lay public it came to be used as a convenient label for an undiscovered and mythical creature which, when found, would somehow settle all evolutionary problems at one stroke. It would “prove” man’s relationship to “monkeys.” Pending that discovery, the public settled back to enjoy as a prime sporting event, the titanic debates between eminent divines and prominent scientists who locked horns in combat over the new heresy.

The public forgot, in the fascination it felt for this unknown and devilishly intriguing skeleton in the human family closet, that Dr. Dubois had spoken of “a link,” not “the link.” As finds of fossil men in the following decades continued to accumulate, each one tended to be eyed hopefully by the reporters of the more lurid press as the long-sought “missing link” which scientists were assumed to be assiduously seeking. The finds reported were never entirely satisfying. The “missing link” had become a tradition. He was much more fun to search for than to find or to accept, so far as the general public was concerned. Yet, actually, and this should have been apparent to any intelligent onlooker from the first, what was missing was not one link, but many—a chain, a series of forms stretching back into the inconceivable vistas of geologic time out of which the human stock, as it exists today, had emerged.

Our recovered human fossils were like stills secured at distant intervals from a motion picture. They were hints, stages, call them what you will, in a story with sequence and temporal duration. But no one picture could be called the story or contain the full drama. The time-flow would

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be lost and the transitions missing or imperfect. Only by an intensive search for as many pictures (*i.e.* fossils) as it was possible to secure might the linked and forever changing film of the past be restored in such a fashion to be rerun for modern eyes with some semblance of continuity. That was what scientists were striving for; that was why the term “the missing link” came, in the ears of scholars, to suggest the fulminations of religious controversy, or the ingenuous credulity of the curiosity seeker. That is why, in this account of certain remarkable discoveries in Palestine, we must explain and use the term with the utmost care.

II

Of all the fossil forms of man that now lie in the laboratories of our great museums, *Homo neanderthalensis* is closest to us in point of time. Though he is but one of several big-brow-ridged primitive species whose history, we know, runs backward into the early dawn of humanity a million years ago, Neanderthal man, in the public eye, is the cave man *par excellence*.

He is the prototype of comic-strip characters who cavort unscientifically with dinosaurs and with female consorts resembling movie actresses. His cave-dwelling propensities and assumed ferocity of character in love and war have made the term “cave man” both a byword and the ideal of sophomoric youth intent on impressing modern femininity. He is one of our earliest discoveries and his remains continue to turn up sporadically over a wide area in Europe and near-by areas of the Old World land mass. It is possible that he is our direct ancestor. At all events, he has assumed legendary proportions in the public mind.

If we leave aside minor differences due to sex and individual variation, an accurate, if brief, description of Neanderthal man as known from his skeletal remains would run somewhat as follows. The skull was large and capacious, the cranial capacity being the equal if not the superior of that of existing man. The forehead, however, was low and sloping and immense jutting ridges of bone protruded in an anthropoidal fashion above the eyes. The skull bones were thick and heavy and the areas for muscular attachment ridged and powerful. The face was larger in proportion to the brain-bearing portion of the skull than in modern man. The lower jaw lacked the projecting chin eminence of our own species and hence was chinless and primitive. The neck was short and powerful, the body thickset and stocky—the stature in males ranging around five feet one inch to five feet five inches, and thus short, by modern standards. A careful anatomical analysis reveals a vast series of skeletal characters indicating the affinity of Neanderthal man to the even more primitive and smaller-brained anthropoidal men of the earlier Ice-Age, such as *Pithecanthropus*, Dr. Dubois' original find.

Neanderthal man, however, is known to have survived into the time of the last glacial advance in Europe and to have inhabited the caves of France and Germany perhaps no more than 50,000 years ago. Vanishing suddenly for reasons we do not understand, he was replaced on the European scene by hunters who belong to our own species and are, indeed, our own direct forebears. Under these mysterious circumstances it was inevitable that discussion would arise as to whether Neanderthal man had simply evolved into the present human type on the European scene, or whether our own species had intruded into Europe from some other area and exterminated by superior weapons and intellectual ability, this more primitive and archaic human type.

In spite of the widely held view that *Homo sapiens*, our own species, had passed through a Neanderthaloid phase in its own evolution, no satisfactory transitional forms or "links" had been produced which satisfactorily proved such a line of descent. In spite of variations among the known Neanderthals, the British scholar Morant had shown that the measurements of the Neanderthals diverged sharply in a majority of characters from those of *sapiens* and that no transition seemed demonstrable. Many scientists began to look elsewhere for the origins of our particular stock and to regard Neanderthal as an archaic human relative who, whatever his original relationship to ourselves, had lingered on for a short space as a contemporary rather than an ancestor of modern man. Nevertheless, many continued to regard him as an inescapable human progenitor even if the transition had actually taken place somewhere else than on the European scene.

All of this extended controversy brought one point into clear relief: that our recovered human fossils, fascinating though they were, had to be defined as distinct species. *They were thus independent points in a chain whose transitional links were conspicuously absent.* There was danger, in the presence of these wide gaps, that our interpretations would prove erroneous and incomplete. Moreover, the slow course which evolution seems to take made dubious so rapid a human transformation as would have been demanded to derive our tall, completely human line from those barrel-chested, protrusive-faced and primitive Neanderthals in a short fraction of the few thousands of years involved in the last glacial advance in Europe. It was under these circumstances that one of the most spectacular finds in the entire field of human prehistory turned up in Palestine. Sensational it was beyond measure, and it was sensational for the reason that if accepted at its face value it was that rarest of all rare things—a *true missing link*; that is, *a form so closely connecting two already known species that there could no longer be any question that the one was ancestral to the other.* To top off this extraordinary human drama, the discovery had been made in caves not many miles from Jerusalem in the heart of the Holy Land.

III

A combined expedition of the American School of Prehistoric Research and the London College of Surgeons excavated two limestone caves on the slopes of Mount Carmel, which lies a mile or so from the Mediterranean, some fifteen miles south of Haifa. The cave shelters were thoroughly and scientifically investigated over seven seasons. Vast quantities of artifacts assignable to successive human occupations were collected. In 1931 and 1932, however, the human remains at whose significance we have hinted, were discovered. So difficult was the task of their restoration and study that only recently have the full results of Dr. Theodore McCown's and Sir Arthur Keith's investigation of the material become available.

The finds range from a Neanderthaloid female recovered from one of the levels of the cave designated as Tabun to a series of ten individuals in a varying state of preservation secured from the other near-by cave named the Mughareh es Skhul. These latter specimens in particular, constitute an amazing assemblage. Each individual is a mosaic of advanced and primitive characters displaying an incredible degree of variation for so numerically small and presumably isolated a people. Keith and McCown themselves comment, "Had the Mount Carmel people been discovered—not collectively, in one place, but separately, in diverse localities, each excavator would have been convinced that a new and separate form of humanity had been unearthed, so great does one Carmelite individual differ from another."

Though the site lies outside the area of the great European glaciations, studies of animal remains found in the levels of human occupation make it clear that the Skhul and Tabun caves were occupied by this queer human assemblage some time during the latter half of the Riss-Wurm interglacial period. This population is thus older than the remains of many of the European Neanderthals of the last European ice advance; yet oddly enough it is, in many characters, surprisingly modern in appearance, and approaches our own type more completely than the European Neanderthals whom we have earlier described. These Skhul folk, in particular, thus constitute *the first clear evidences of a human type approximating ourselves in times prior to the onset of the last or Wurmian ice advance which ended in Europe some ten to fifteen thousand years ago*. They are, in short, ourselves, and yet they are not. They leave the anatomist weighing the value of various anatomical characters and loth to classify them as either *Homo sapiens* or *Homo neanderthalensis*. They partake of the character of both. To make our judgment even more sure, we have several individuals and we have more than their skulls. We have a splendid collection of the bones of the body—something almost unheard of in Ice Age discoveries of fossil man.

Neanderthal man, as we previously indicated, was short and stocky; the Mount Carmel cave folk, more particularly the men, were tall, ranging from five feet eight inches to five feet ten inches. The vault of the skull, though varying somewhat individually, is high instead of being low and compressed from above downward as in Neanderthal. Though the brow ridge in males is still pronounced by modern standards, it shows a trend toward the condition found in rugged modern types and is by no means as heavy as in the archaic forms of man. The face is neither as protrusive nor as large in proportion to the cranium as in *neanderthalensis*; the skull capacity, as in the Cro-Magnon people who were our early European ancestors, averaged larger than in modern man, ranging over 1500 cubic centimeters in males. In the words of McCown and Keith, "Neither in size nor in form of lobes is there a decided difference from the brain of Neanthropic (existing) man." Adaptation to bipedal progression and upright posture seem clearly superior to the short-limbed Neanderthals.

On the other hand, there was a considerable range of characters, many of too technical a nature to be discussed here, in which Neanderthal traits predominated or in which clearly intermediate conditions between *neanderthalensis* and *sapiens* were observable.

Keith and McCown estimate that out of a total of 111 characters, 14% were completely Neanderthaloid, almost 29% were of modern character, and 41% intermediate, other characters being peculiar or indeterminate. At first glance this seems to throw the weight of the estimate toward *Homo sapiens*, but after a careful weighing of the significance of various traits, the authors do not feel that the Skhul folk can be classified as lying directly within our species. Instead "The Mount Carmel people collectively possess intermediate states which bridge the structural hiatus lying between the Neanderthal and Neanthropic (modern) types."

They appear, in other words, to be missing links in the sense that we have used that term. Because of their antiquity as compared with many of the European Neanderthals, they also make very clear the fact that a form of tall, big-brained and quite modern-appearing folk was in existence *earlier* than the dating assigned to the "cave men" of western Europe. It thus seems obvious that some of this latter stock lingered on unchanged to become a brief contemporary of modern man even though the Palestinian evidence suggests that somewhere in western Asia similar types had earlier given rise to a form which is our transitional forerunner. Like most archaeological problems, however, this one contains a joker. It may be that it conveniently proves too much and in too short a space of time.

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Another explanation inevitably comes to mind as we survey this odd assemblage of beings who dwelt on the slopes of Mount Carmel—an explanation which, though intriguing in its own right, would illuminate but little the origins of that creature in which we are intensely interested, namely, ourselves. Can it be—so runs the little disturbing thought which will not be quieted—can it be that we are dealing with a group of mixed bloods, of hybrids between Neanderthal and a type already essentially modern?

Sir Arthur Keith and Dr. McCown dismiss this possibility on the grounds that to support such a theory we should have to have evidence of a pure Neanderthal and a pure *sapiens* type from Palestine at this early date. Naturally such evidence is lacking at present. But considering how little archaeological work of this nature has been done in the Near East, the suggestion of hybridity can scarcely be dismissed on this basis alone. Moreover, the individual from the Tabun cave is essentially Neanderthaloid in stature and appearance.

Does it seem likely that ordinary evolutionary processes of slow change within an unmixed group would produce so strange a medley of characters within so short a span of years as is represented by the Skhul people of this single cave? Small groups of organisms, even when some mutative character is introduced, tend, because of interbreeding, to acquire rapidly the new character *in toto*, not to continue to vary in this amazing manner. Has the Neanderthal stature suddenly jumped among these people by five inches? Have all of the other intricate details of anatomical structure begun of themselves to vary in the direction of *sapiens* at this bewilderingly fast pace? It would seem dubious in the light of the geneticists' insistence, on the basis of experimental evidence, that simultaneous mutation of masses of genes is unknown in nature.

The genetic inheritance of the anatomical characters of bones has been little studied. We have no knowledge of what the effect of crossing two such differing forms as Neanderthal man and the existing human type might be or what characters would emerge or float as recessives in the germ plasm. We do know, however, that interracial crosses are apt to produce momentarily a greater scattering of variability until the new gene combinations which determine heredity have been widely distributed and the group, as a consequence, takes on a new stable pattern. In a more striking way, because of the greater differences involved, this may have been the process taking place at Mount Carmel. Perhaps even the suddenly increased stature may be partly the result of the phenomenon known as "hybrid vigor." In the words of the anatomist Ashley-Montague, "The evidence appears to indicate very strongly that the Carmelites represented a group which had recently received a new infusion of genes from some Neanthropic (*Homo sapiens*) group."

PRAIRIE SCHOONER

Attractive though the "missing link" hypothesis may be from the standpoint of a graceful solution of many problems in human evolution, this particular case has proved too much in too short a space of time. We are, therefore, forced to wait for less ambiguous evidence.

The fault does not lie in this unique and invaluable discovery which, among other things, has demonstrated that an essentially modern brain and facial structure already existed in the Riss-Wurm Interglacial. It lies in our inadequate knowledge of human genetics and the processes which influence or determine the rapidity of human evolution. Only as our knowledge of the Ice Age population of Palestine increases and the science of genetics grows more sure will the vistas of human prehistory opened by the sleepers in the cave of Mughareet es Skhul be capable of interpretation by modern eyes.

APOTHECARY SHOP

BERNICE SLOTE

The way he was going, he could not tarry.
But he told me this, the apothecary:
"My shop has herbs, and bottles that ray
The sun through glass and color my day.
It's an amethyst, gold, vermilion room.
Garnet and green the corners bloom.
Wine and amber and twilight blue—
In separate ways my sight falls through
The mingling smells of—how many woods?
By leaf and by root I've gone down roads
A man will travel. Which do you know?
Bittersweet herb and wild indigo?
I'll show them all. Here's nut-gall (ground),
Boneset, squaw-vine, strewn around.
Yarrow and hemp and Queen of the Meadow,
Wahoo bark and a little Dutch madder.
Have what you wish for healing and dreams
(My shop is timeless and not what it seems).
A pocket of Life Everlasting will be
The only herb I'll take with me.
I'll give you some rue and close my store.
The bottles you'll find of yourself. Explore!"
He was still as death, the apothecary,
But he said all this when they came to bury.