

# A New Analysis of An Old Box of Bones: Debunking a Peking Man Deception

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## ABSTRACT

Anthropologists have searched fruitlessly for the Peking Man fossils for almost eighty years. Writers have made many unwarranted claims about the loss of the fossils, starting with the assumption that they were transferred from Chinese to American control just before the Japanese attack on Pearl Harbor in 1941 and then brought to the United States. This line of thinking is primarily supported by a highly suspect piece of evidence that came to public attention in 1972—a photograph of a Marine footlocker with many bones, one of which appeared to be a Peking Man skull. Although experts examined the photograph, no formal analysis was performed. Nonetheless, people who have written about this subject have assumed the box of bones contains at least one of the Peking Man fossils and thus that the collection reached the U.S. After conducting a detailed inventory and analysis of the contents of the footlocker as revealed in the photograph, we propose that the photograph is a deception; all bones except the skull are modern anatomical specimens while the skull is best interpreted as a teaching cast. Thus, the photograph cannot be used as evidence that the Peking Man fossils ever came to the U.S.

## THE PEKING MAN FOSSILS

In the 1920s and 1930s excavations at Choukoutien (Zhoukoudian<sup>s</sup>) near Peking (Beijing<sup>s</sup>) produced numerous early human fossils. Today the fossils are classified as *Homo erectus* (Schwartz and Tattersall 2005: 547), members of a very successful species that lived in many parts of Europe, Africa, and Asia. The individuals represented by the fossils found at Choukoutien date from approximately 700,000 years ago (Shen et al. 2009: 198). At the time of excavation, the fossils were some of the only prehistoric human remains found outside Europe (Black 1926: 734). Davidson Black, a Canadian anatomist with the Peking Union Medical College (PUMC), and Chinese geologist Weng Wenhao established the Cenozoic Research Laboratory (CRL) for the purpose of further excavating finds from the limestone quarry that had already revealed two human-like teeth. Black, Weng, and their team of scientists discovered remains of a hominin (then called *Sinanthropus pekinensis*) at Choukoutien (Black 1927: 21). Black died in 1934 and was succeeded by Franz Weidenreich, a German anatomist. Weidenreich and his team unearthed more skulls, teeth, and a few postcranial bones of at least 50 individuals (Boaz et al 2004: 546). Weidenreich reconstructed and directed a

technician to make casts of the Peking Man skulls (Jia and Huang 1990: 159) before leaving China.

The Peking Man fossils were last seen in November 1941 during a period of diplomatic and military chaos. China had been enmeshed in three wars during the early to mid-1900s—the Chinese Civil War, the Second Sino-Japanese War, and World War II. Before the start of WWII, Japanese soldiers had already been present in China for four years. In December 1941 the Japanese presence escalated swiftly.

For months prior to WWII, Chinese scientists at the CRL attempted to safeguard the fossils from possible seizure by the Japanese (Plumb 1952). Tentative plans for removing the fossils from the PUMC called for transporting them to the Marine unit or the U.S. Embassy, which would then transport them to the United States (Pei n.d.). The fossils were boxed at the PUMC, their last known location (Jia and Huang 1990: 160). It has been assumed that the fossils had been moved from the PUMC to the U.S. Marines in early December 1941 and lost during their transport to the United States. There is no evidence to support this supposition (Roberts et al. 2021).

## GOALS OF THE STUDY

Although there are multiple storylines concerning the loss of the fossils, one dominant narrative has emerged. We have termed this narrative the “Standard Scenario,” though it is not grounded in evidence and has many deficiencies (addressed in our companion article [Roberts et al. 2021]). For example, writers have mistakenly characterized casual popular accounts as factually based and continue to build conjectures upon them, despite the inconsistency and incongruity of the accounts.

Uncritical acceptance of the Standard Scenario opened the doors to treasure hunting and unreasonable speculation—the fossils were said to be lost in the China Sea, transported in the personal baggage of a Marine surgeon, buried in a hole underneath either of two Marine barracks, or depicted in a photograph shown to a curious businessman atop the Empire State Building in New York City. This last speculation is the focus of the current paper. We specifically address a 1972 photograph thought to be of a Marine footlocker containing a Peking Man skull.

Our overall project (Roberts et al. 2021) has three principal goals: 1) to highlight missteps in past investigations that have impeded progress towards its valid resolution; 2) to demonstrate how exhaustive scrutiny and holistic analysis of evidence can eliminate spurious proposals; and, 3) to establish a new and evidence-based starting place in present and future searches for the missing Peking Man fossils. We hope this analysis provides a template for such an investigation.

## OVERVIEW OF THE CIRCUMSTANCES AND CONTEXT OF THE PHOTOGRAPH

Christopher Janus, an American businessman, visited China in 1972. While at the Peking Man Museum at Choukoutien, he was asked by officials there to search for the fossils in the United States (thus it appears that even Chinese officials adopted the Standard Scenario). On his return to the U.S. Janus held a press conference, distributed a request for information, and offered a reward.

Janus dismissed many of the responses as attempts to swindle him, but a few caught his attention sufficiently for serious follow-up. One in particular came from a woman claiming to be the wife of a Marine who had served in Peking prior to the war. She stated that she had possession of the fossils. She only agreed to meet with Janus atop the Empire State Building. This location and the clandestine, furtive behavior of the woman brought additional drama and intrigue to the Peking Man story and may contribute to its attractiveness as an ongoing saga. The woman showed Janus a photograph of a footlocker containing numerous bones including a skull. She said her husband claimed that the bones were of Peking Man. She left before giving Janus a copy of the photograph. Janus subsequently put an advertisement in the *New York Times* (Janus 1972), and she responded. He asked for a copy of the photograph and, surprisingly, he received one in the mail shortly after (Figure 1).

Janus had no archaeological or anatomical knowledge,

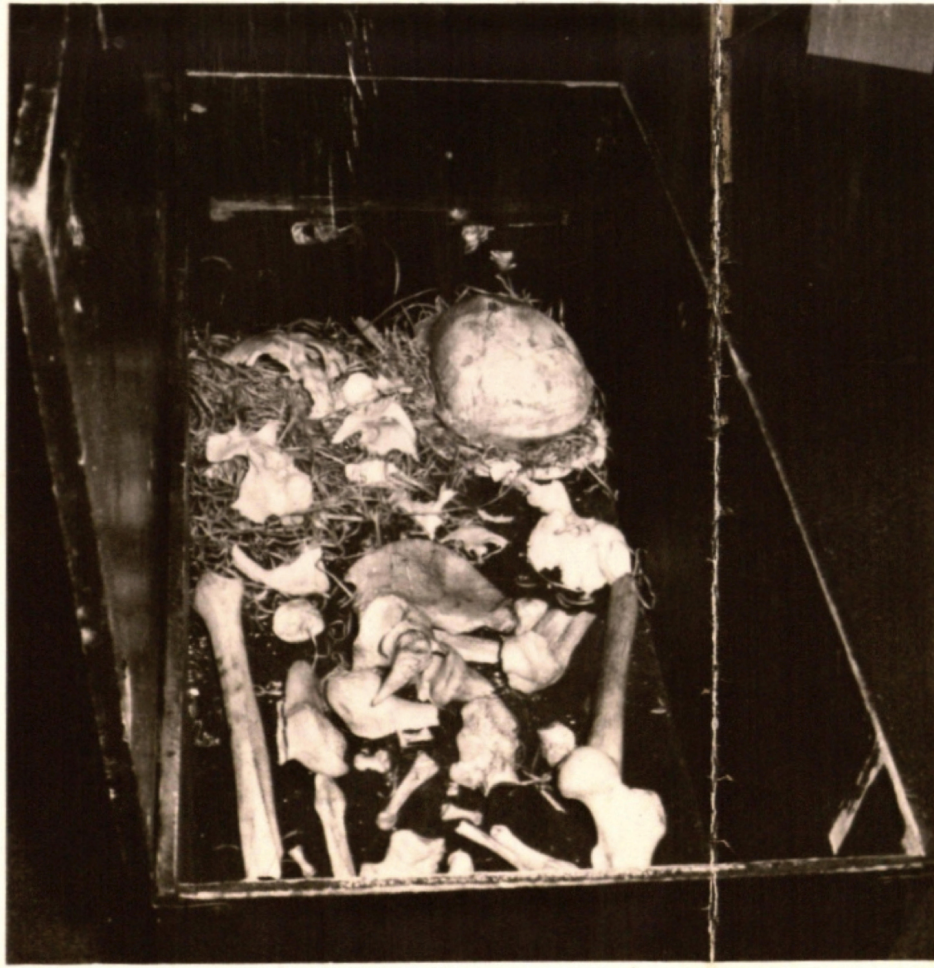
so he asked Harry Shapiro (American Museum of Natural History [AMNH]) for his opinion on the legitimacy of the photograph. Shapiro was an experienced anthropologist and recognized the resemblance between the skull at upper right of the photograph and one of the skulls from Choukoutien, Skull XI (also called Skull II from Locus L) (Weidenreich 1943). Shapiro and Janus consulted other well-known anthropologists—Richard Leakey (Natural History Museum of Kenya), and Drs. William W. Howells (Harvard University), G.H.R. von Koenigswald (Museum of Natural History of Frankfurt), Phillip Tobias (University of the Witwatersrand, Johannesburg), and Glenn Cole (Field Museum, Chicago).

Leakey and von Koenigswald were the only anthropologists to consider the significance of the modern bones. Leakey observed that much of the bone assemblage belonged to modern humans and therefore immediately dismissed the entire contents of the footlocker as a hoax. Tobias and Howells disregarded the modern bones and focused only on the skull. They agreed with Shapiro that it was *enough like* Skull XI from Choukoutien to suggest further examination. Von Koenigswald rejected the validity of the entire box, very likely because he was the only one of the scientists to have seen the original Peking Man bones in person and surmised that the modern bones were a later addition. Though Leakey and von Koenigswald said this box was a hoax, the longevity of belief in the photograph's validity is due to the positive comments of Howells and Tobias. These opinions are analyzed below.

Tobias insisted that the skull was an original Peking Man fossil (Janus and Brashler 1975: 168). His opinion produced a paradox unrecognized by other authors who tell the story of the Peking Man bones—nearly all the footlocker material was of modern anatomical specimens unrelated to Peking Man, but because of the apparent resemblance of the skull to a real Peking Man calvarium, no one questioned how two such incompatible sets of bones could have been together if the contents of the footlocker were genuine. Three of these scientists (von Koenigswald, Howells, and Tobias) were present at a symposium in 1973 (Tuttle 1975) at which Janus presented information concerning his search. Von Koenigswald restated his conclusion that the photograph was not of an authentic Peking Man skull, but Howells and Tobias maintained their view of the authenticity of the skull and the photograph.

## PREVIOUS PUBLICATIONS OF THE PHOTOGRAPH

Janus and Shapiro both published grainy reproductions of the photograph in their books on Peking Man (Janus and Bashler 1975; Shapiro 1974). Janus also published a full-sized version of the photograph in the proceedings of a paleoanthropology conference (Tuttle 1975) where he discussed the items in the footlocker with Drs. Howells, Tobias, and von Koenigswald. None of these anthropologists who examined the photograph, nor anyone since, has provided analysis of the modern bone contents, nor have they published a detailed analysis of the footlocker photograph.



*Figure 1. A high-quality reproduction of the photograph of the Marine footlocker provided to Janus (source: AMNH Shapiro Collection). The photograph shows a skull (upper right) along with disarticulated skeletal material and straw. The vertical line is a crease in the original photograph in the AMNH archives.*

We are attempting to rectify the lack of detailed analysis of the bones in the photograph. In order to be thorough, we obtained a high-quality copy of the original photograph from Harry Shapiro's archives (Shapiro 1972). The photograph shows a more complete view of the footlocker and the surrounding room than what Janus or Shapiro published. The focus and contrast are clearer in this version of the photograph, making most of the skeletal elements easier to identify.

Our forensic analysis includes the following: a comprehensive inventory of the known/suspected bones (Appendix A), a detailed description of the known elements (Appendix B), a holistic analysis of the footlocker contents (see below), an analysis of specific areas of interest within the footlocker (see below), analysis of specific modern bones (see below), and analysis of the calvarium (see below). Furthermore, we provide analysis of the footlocker itself and composition of the photograph (see below). We bring the component parts back together to create a coherent whole and present our conclusions in the final section (see below).

#### **PREVIOUS ANALYSIS OF THE PHOTOGRAPH**

The anthropologists who examined Janus's photograph agreed that all the bones belonged to modern humans except for the skull in the upper right quadrant, which was considered by Howells and Tobias to be one of the original Peking Man skulls. Tobias possessed a cast of Skull XI, made from Weidenreich's original cast of the female Skull XI. Tobias considered his cast to be quite different in detail from the skull in the photograph. Tobias and Howells therefore focused their attention on the skull and discounted the context the modern bones gave to the photograph (Shapiro 1974: 167). Our paper aims to address this oversight and analyze the surrounding bones, footlocker, and photograph to bring a new perspective to the skull. Our analysis of the calvarium is below.

#### **HOLISTIC ANALYSIS OF THE PHOTOGRAPH AND ARRANGEMENT OF THE SKELETAL ELEMENTS**

We have approached the analysis of the photograph from





Figure 2. Closeup of a portion of the photograph in Figure 1. Identified skeletal elements have been numbered and the photograph is separated into four quadrants for pattern analysis. Numbered bones are identified in Appendix A.

a holistic perspective, meaning that we first examined the photograph in its entirety in order to understand its complexity and detect any overarching patterns of placement of the various skeletal elements and calvarium. We view the contents of the photograph as component parts best understood in context and relation to one another and to the whole.

**Photograph:** The black and white photograph (see Figure 1) contains an image of a used military-style footlocker containing a single layer of human skeletal remains mixed with straw. Based on the angle of shadows and light, the photographer was standing at one end of the footlocker and to the left. The light source was mounted on the camera or near the photographer, either behind or to the right. The light was bright enough that it washed out some details in the bones, such as suture lines known to be on the original Skull XI. However, many specific features on the bones are visible, allowing us to identify them. A gray geometric shape appearing to be the lid of a nearby cardboard box is located in the upper right corner of the photograph.

**Crease:** the photograph in Shapiro's archives has a crease running vertically on the right side. This crease was not present when Janus presented the photograph for pub-

lication in 1974 (Tuttle 1975) and must have occurred while in either Janus or Shapiro's possession. The crease cuts through the footlocker in the image but does not distort any of the bones.

**Skeletal Elements in the Photograph:** The footlocker's contents are shown in Figure 2; each identifiable bone is numbered and described in detail in Appendices A and B. The contents consist of two incompatible sets of remains mixed with light-colored straw—a calvarium resembling the Skull XI fossil in the upper right corner and a collection of modern human bones scattered on the floor of the footlocker. Limb bones and one coxal bone are placed throughout the lower two-thirds of the photograph. Most cranial elements are located at the far end of the footlocker, while the limb and girdle bones fill the other 2/3 of the footlocker. The straw is plentiful in the far 1/3 of the footlocker, where the cranial bones and calvarium are located. The density of straw dissipates toward the near end and the bones closest to the photographer appear to sit on the floor of the footlocker. The right 1/3 of the photograph is outside of the footlocker and very dark. The dark area was omitted in both Janus and Shapiro's books but was published in its entirety in Tuttle's 1975 account.

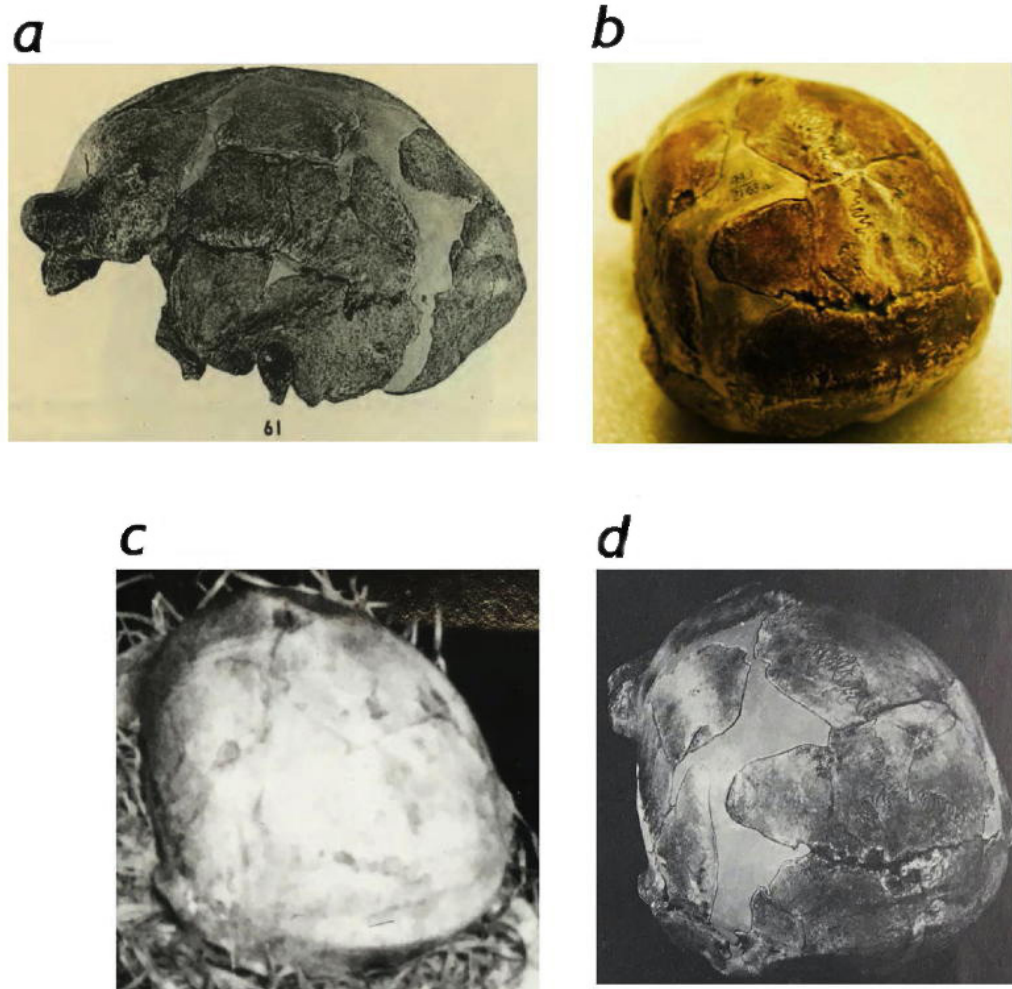


Figure 3. Different versions of Choukoutien Skull XI. a) Figure 61 from Weidenreich's study (1943: 341), photographed from the original. The skull is 190mm anterior-posterior; b) A cast from the American Museum of Natural History, photographed by the authors in roughly the same orientation as the skull in Figure 1. Note the indentation on the top of the skull near the bregma. This unusual feature is distinctive and allows certainty that the calvarium in the footlocker represents Skull XI. None of Weidenreich's original figures are in an orientation to show the dorsal indentation. In both images **a** and **b**, areas of dark color represent original bone and areas of light color represent plaster filling for missing bone and to hold the original bone fragments together; c) Blow-up of skull in Janus' photograph (Figure 1), showing lack of differentiation of surface color between bone and plaster; d) Photograph from Cox (1974) showing cast of Skull XI with the surface color differentiation clearly present.

**Modern Bones:** The modern bones appear light in color with little to no discoloration, which makes their appearance inconsistent with the original fossilized bones from Choukoutien (Figure 3a), which were darker. In addition to this incongruity, several bones show modern alteration, which are discussed below.

#### PATTERN ANALYSIS

The entire image is of a large cluster of bones filling the bottom of a footlocker. We determined that most of the bones were clustered in groups showing anatomical relationships, suggesting a non-random placement of the bones into the footlocker.

- Some bones are sitting on top of straw, possibly to protect or stabilize, but also in ways that obscure them.
- All cranial bones are clustered around each other. No cranial bones are found in the lower half of the photograph.
- Suspected arm bones seem to be clustered together to the right of the pelvis. These could include the following: acromial end of a clavicle, distal end and diaphysis of a humerus, proximal olecranon process of an ulna and partial scapula with coracoid process facing the tibia. Unfortunately, these bones do not have enough detail to confidently determine exact bone, size, or side.
- The lower half of the photograph represents primarily lower girdle, limb, foot, and ankle bones. The pelvis, femur, tibia, and fibula are all from the left side of the body. Some of the lower limb bones are altered by cutting or intentional breakage. These modern bones have

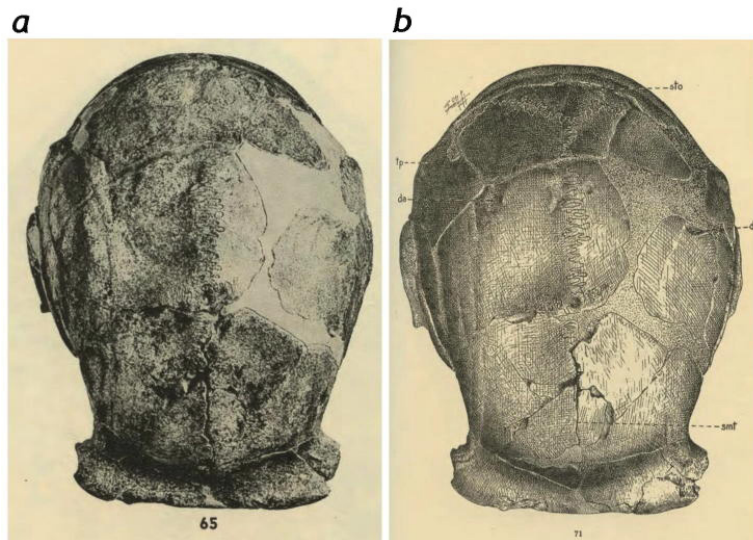


Figure 4. Figures 65 and 71 from Weidenreich's study (1943: 343, 351). The depression at the bregma is visible and does not pass through the table of bone to the cranial vault. Norma verticalis. Drawing from the original. Abbreviations: **da**, artificial depression; **smt**, sutura metopica; **sto**, sutura transversa occipitalis; **tp**, torus angularis ossis parietalis. Weidenreich (1943: 343, 351; Plate XXVI. Figure 71).

been altered, probably for the purpose of anatomical teaching or study (next section).

#### ANALYSIS OF SPECIFIC BONES (#27 AND #28)

Two of the bones in the footlocker contain evidence of modern alteration. Bones 27 and 28 are the left and right halves of the distal end of a left femur.

- Bone 27 is the antero-lateral view of the distal end, showing the metaphysis, lateral epicondyle and condyle, several centimeters of diaphysis, and a straight edge where bone 28 should have connected.
- Bone 28 is the antero-medial side of the same distal portion, with the lateral epicondyle facing the camera. The medial edge of 27 appears to have been sawed. The vertical length of the fractured diaphysis is equivalent on both bone 27 and 28, furthering evidence that they are two halves of the same bone. The edge is straight with a fragment missing at the superior edge of the cut. Natural processes can erode the edges of bone and create wear patterns distinctive to environmental exposure. Bones 27 and 28 do not exhibit the typical wear patterns that would be expected from long term submersion in soil.
- Both Bones #27 and #28 are cut in a way that anatomists would saw a femur to demonstrate the internal trabecular orientation.

#### ANALYSIS OF THE CALVARIUM

The original Choukoutien Skull XI fossil, as photographed and drawn by Weidenreich, appears as a very dark, stained bone, with clearly distinguishable plaster added to hold the fragments together (see Figures 3a; Figure 4). By the 1970s, many casts of different qualities have been made of Skull XI (Mann and Monge 1987: 3). The Peking Man research casts

at the AMNH, as well as the skull in Figure 3b, for example, were artificially colored dark to match the originals (Cox 1974; Grutzner 1952).

If Janus' photograph is legitimate and contains the original fossil, then it has to be the very same skull on which Weidenreich worked (see Figures 3 and 4). This point must be kept in mind when considering Tobias' interpretations. As our analysis shows below, Tobias appears to not have taken Weidenreich's drawings and photographs of the original fossils into account. Tobias wrote in a letter to Janus that the skull in the footlocker *must be* the original fossil (Janus 1975: 168), based on two observations that he thought were definitive: 1) the contrast of the photograph's calvarium to a cast in his personal possession that he may have mistakenly believed was the only type of cast made of Skull XI; and, 2) indentation at the bregma (junction of sagittal and coronal sutures) that allowed him to think he could see the thickness of the cranial bone in the footlocker photograph.

Tobias possessed a cast of Skull XI in which several fracture lines and missing bones near the bregma were filled with plaster (Janus and Brashler 1975: 165). The photograph also appears to show a crater-like depression at the bregma. Tobias interpreted this crater to indicate enough of a depression that he thought the calvarium in the photograph was not like his cast (Janus and Brashler 1975: 167), and, therefore, that the photograph must have been the original Peking Man Skull XI. Weidenreich's photograph and drawing of Skull XI (see Figures 3a and 4) show no hole. It appears that this indentation is only an artifact of the angle of the skull and the lighting in the grainy photograph.

And yet, in two separate discussions (Janus and Brashler 1975: 168; Tuttle 1975: 300), Howells and Tobias





Figure 5. Our photograph of a Peking Man skull cast (Tattersall and Sawyer 1996), along with straw and assorted modern human bones from the Linfield University anatomical collection. The modern bones include those we were able to identify with certainty from Janus' photograph (Figure 2). Several of the bones in Janus' photograph had their ends sawed off and were placed in the footlocker for that photograph. We have duplicated these bones with 3-D printings of the equivalent bone. Note especially the femur fragment at left (near tibia), which had been sawed lengthwise and an additional sawcut (thin black line) made in the distal condyle. This fragment is also visible in Figure 2.

maintained their position that the calvarium was the original Skull XI even though Howells considered that it might also be a "good cast." (But if it is a cast, good or not, it is not authentic and is irrelevant to the question of what happened to the Peking Man fossils). Thus, the two opinions of Howells on the calvarium—that it is the "original" or a "good cast" (Tuttle 1975: 300)—are not compatible with each other and in our view provide no useful information. We have already given the reasoning for our position that the calvarium is a cast; we therefore propose that the photograph does not include any legitimate Peking Man fossils especially as it does not show the same skull Weidenreich studied (see Figure 3a) and it contains modern bones.

#### ANALYSIS OF THE FOOTLOCKER AND CONTENTS AND OUR RECREATION OF THE 1972 PHOTOGRAPH

Analysis of the arrangement of bones indicates purposeful placement—the bones were positioned for maximum identification by a casual viewer. Ribs are placed under the calvarium and completely encircle the posterior side, seemingly like a nest. Cranial and limb bones are clustered in the upper 1/3 of the footlocker and toward the lower right corner, respectively. Although the calvarium is turned

away from the photographer, it is placed in a manner that made identification easy because of the distinctive fracture lines near, and indentation at, the bregma. Though none of the modern material was similar in bone type, color, or structure to the original fossils, it is likely that the hoaxers thought a combination of a distinctive calvarium and additional bones would deceive observers.

Janus' original photograph (see Figure 1; Tuttle 1975) includes the entire length and sides of the footlocker, allowing a better understanding of the structure of the locker and its dimensions, which we estimate as 36cm x 41cm x 72cm. We purchased a military footlocker with similar dimensions from an antique store and were also able to place into it (along with straw packing material) the modern human bones we could identify from the photograph. We made 3-D prints of portions of the long bones that had been sawed and placed these fragments into our footlocker in the same orientations (Figure 5).

The skull in our photograph is not identical to the one in Janus' photograph because Linfield University owns a different Peking Man skull (Tattersall and Sawyer's recent reconstruction [1996]). Nor could all of the identified postcranial bones be replicated in our reconstruction. Nonetheless, Figure 5 demonstrates how easy it would be for someone with anatomical knowledge and material to

manufacture the scene in Janus' photograph.

## DISCUSSION

Our position is that the footlocker photograph—its concept and its contents—represent an intentional deception, as evidenced by three important points: 1) the anatomical incongruity of the modern bones, including cut marks on the large bones (see above); 2) the placement of modern bones with a calvarium that resembles the original Peking Man skull XI; and, 3) the haphazard arrangement of these bones meaning the perpetrator had access to these materials, while also having at least cursory knowledge of anatomy, and of the Peking Man fossils. The hoaxers may have thought they only had to fool Janus.

The photograph, however, was studied by well-known anthropologists; some discounted its credibility out-of-hand but they did not follow through with a definitive exposition of its legitimacy as evidence. Though the photograph's provenance is unclear and lacks documentation, it was taken seriously by scientists at the time. The resemblance of the calvarium in the photograph to Skull XI has misled investigators since 1972 by overlooking the incongruity of the "old" calvarium and the modern bones. Indeed, the caption to the figure showing the footlocker in Tuttle's 1975 account indicates that the footlocker may contain "some fossils," not just a single skull. The figure thus perpetuates the idea that original Peking Man material was included along with what we have identified as modern human bones. Though Leakey and von Koenigswald were not fooled, the storyline was controlled by Howells and Tobias. The deceptive photograph was thus absorbed into the narrative stew of the Standard Scenario, enhancing its popular appeal at the expense of advancing fruitful inquiry.

The hoax has added to the belief (documented in Roberts et al. 2021) in a sensationalized narrative that presents a "good mystery story." The public and some investigators uncritically accept the hypothesis that the fossils were received by the Americans in Peking. Our analysis resolves the paradox created by Tobias when he ignored the modern bones—a box containing the legitimate Peking Man material would not have also contained modern anatomical specimens because modern bones were not boxed together with Peking Man material at the PUMC in 1941 (Jia and Huang: 161). We suggest the calvarium is a cast of Skull XI surrounded by modern human bones, most likely from an anatomical skeletal collection. This conclusion is consistent with the results of our additional textual investigations and archival research presented in the companion paper (Roberts et al. 2021). The photograph of the footlocker and its Peking Man skull cast should no longer be used as evidence that it contained the actual Peking Man fossils.

## ENDNOTE

<sup>§</sup>Comments on the forms of Chinese place names used: In this article, we use the English transliterations of Chinese place names (Choukoutien and Peking) that were current from the 1920s to the 1940s because that is how all the documents we used refer to them. The current spellings are Zhoukoudian and Beijing respectively.

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## CONTRIBUTIONS

ED, MR, and JM jointly conceived the idea of performing a forensic analysis of the contents of a photograph important to the disposition of the Peking Man fossils. ED carried out the detailed forensic and osteological analysis and wrote the initial draft. ED, MR, and JM collaborated on the final draft. All authors read and approved the final manuscript.

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## APPENDIX A

Bones identified in the footlocker [bones that exist in R/L pairs have a blackened cell in the paired column ("P"); unpaired bones have blackened cells in the R/L columns]

APPENDIX A TABLE 01. COMPLETE LIST OF KNOWN AND/OR SUSPECTED MODERN BONES FROM A 1972 PHOTOGRAPH PERTAINING TO THE PEKING MAN FOSSILS.\*

# in Janus Photo	AXIAL	Pair	NP	None numbered in Janus Photo	UPPER APP	P	L	R	NP	
7, 19 31	C1		X	Upper Limb	scapula				X	
	C2		X		clavicle	X				
	C3		X		humerus	X				
	C4		X		radius				X	
	C5		X		ulna	X				
	C6		X		carpals	scaphoid			X	
	T1		X			lunate			X	
	T2		X			triquetrum			X	
	T3		X			pisiform			X	
	T4		X			trapezium			X	
	T5		X			trapezoid			X	
	T6		X			capitate			X	
	T7		X			hamitate			X	
	T8		X		Metacarpals	I-V			X	
	T9		X		Phalanges					
	T10		X		Proximal	I-V			X	
	T11		X		Middle	II-V			X	
	T12		X		Distal	I-V			X	
	L1		X							
	L2		X							
	L3		X							
	L4		X							
	L5		X							
	Sternum		X							
	Ribs	X								
	sacrum	X								
	<b>present</b>	<b>0.08</b>								
	<b>not present</b>	<b>0.9</b>								

\*R=right; L=left; P=paired; NP=not present.

**APPENDIX A TABLE 01. COMPLETE LIST OF KNOWN AND/OR SUSPECTED MODERN BONES FROM A 1972 PHOTOGRAPH PERTAINING TO THE PEKING MAN FOSSILS (continued).\***

	# in Janus Photo	LOWER APP	P	L	R	NP	
Lower	11	pelvis	X	X			
	12, 16, 27, 28	femur	X	X			
	13, 24	tibia	X	X			
	22	fibula	X	X			
	29	patella	X				
tarsals	14	calcaneus	X	X			
	21	talus	X	X			
	15	cuboid	X				
		navicular				X	
cuneiforms		medial				X	
		intermediate				X	
		lateral				X	
metatarsals		I				X	
	25	II	X				
		III				X	
		IV				X	
	18	V	X				
Phalanges							
Proximal		I	X				
		II	X				
		III-V				X	
Middle	23	II, III, V				X	
		IV	X				
Distal	26	I	X				
		II-V				X	
TOTAL			62	62	31	31	62
present			15	6	0	16	
%			24	19	0	26	

\*R=right; L=left; P=paired; NP=not present.



**APPENDIX A TABLE 01. COMPLETE LIST OF KNOWN AND/OR SUSPECTED MODERN BONES FROM A 1972 PHOTOGRAPH PERTAINING TO THE PEKING MAN FOSSILS (continued).\***

# in Janus Photo	CRANIUM	P	L	R	NP
	Frontal				X
	Maxilla				X
4, 9	Zygomatic		X	X	
	Parietal				X
10, 33	Temporal		X	X	
8, 34	Mandible		X	X	
	Lacrimal				X
	Palatine				X
	Vomer				X
	Nasal				X
	Hyoid				X
1	Occipital	X			
	Ethmoid				X
	Sphenoid				X
	% present	14.3	42.9	42.9	
		14	43	43	53
	<b>% present</b>			<b>43</b>	
	<b>% missing</b>			<b>57</b>	

\*R=right; L=left; P=paired; NP=not present.

## APPENDIX B

### Detailed inventory.

A detailed analysis and summary of the identifiable skeletal elements (see Figure 1).

1. Approximately thirty bones are clearly identifiable; these bones are mostly complete (<75%) or have been modified in ways not seen in the Peking Man fossils. All clearly identifiable postcranial elements are exclusively from the left side of the body. None of these bones are the same shape, size, color, and condition as the specimens in the Peking Man fossil collection.
2. A calvarium identical to Skull XI from Choukoutien is in the upper right corner of the footlocker (#6). For a detailed description and analysis, see the Calvarium Analysis section.
3. Cranial bones are limited to the far back 1/3 of the footlocker near Skull XI. Complete bones of modern human skulls have been carefully disarticulated along the sutures in ways that none of the original fossils were.
4. The axial skeleton is represented in several areas of the footlocker. There are at least two, perhaps three ribs located underneath the posterior side of the Skull XI.
5. Upper limb bones appear to be clustered to the right of the pelvis. No complete upper limb bones are present; all appear to be fragmented.
6. Lower limb bones are almost all present: thigh, leg, knee, ankle, and foot. Siding some of the lower limb bones was difficult due to poor lighting, but they clearly belong to a leg and foot rather than a hand.
7. Most cranial fragments are thin and light-colored. An occipital bone with foramen magnum is clearly visible (#1). Temporal bones representing both sides are present on the left and the right of the photograph (#10 and #33), with partial mandibles (#8 and #34) either articulating or placed underneath the temporal bones. No teeth are present or visible. The only clear evidence of facial bones are the zygomatic bones (#4 and #9).
8. The bones lying underneath the skull most resemble upper ribs 1 and 2, however, they are obscured by straw and could be any rib. The sternal end of another rib (#19) is visible at the close end of the footlocker, scattered with the foot bones. A sacrum (#30) is present above the tibia diaphysis: S5 is on the left and the auricular surface is on the right. There is no clear evidence of a coccyx or other vertebral elements.
9. Not all elements of the upper limb are represented; wrist or hand bones do not appear to be present and there is no clear evidence of a scapula. The distal end of a humerus (#20) is peeking out between the talus and a rib. The rounded curve of a medial epicondyle and trochlea is distinctive only to that bone. The distal humerus is a fragment, likely belonging with the cluster of arm bones in the middle of the footlocker. In order to recreate the photograph, we created a 3-D replica of a humerus and made it into a fragment for accuracy.
10. A left pelvis (#11) is clearly visible in the center, and a patella (29) is to the left, near the diaphysis of a tibia. A femur (#12, #16, #27, #28), tibia (#13 and #24) and fibula (#22) are all fragmented or modified. Ankle bones are represented by the calcaneus (#14), talus (#21), and cuboid (#15). A fifth metatarsal (#18) sits next to an unassociated rib end. Another metatarsal (#25) is visible above the talus. The phalanges are all pedal. There are three proximal phalanges (#23), one middle phalanx (next to calcaneus), and one distal phalanx of digit I (#26).
11. The shaft of the tibia (#24) is a fragment. The proximal end of the tibia is fractured where it meets the lip of the footlocker. The proximal tibia (#13) has a visible medial condyle and intertrochanteric crest.
12. The distal end of a fibula (#22) is also a fragment. A modern human fibula would be too long to fit in the footlocker at that angle. Our work replicating the footlocker demonstrated this point.