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Why heads matter in palaeoanthropology: The impacts and consequences of collecting skulls

This piece reflects on the importance of and focus on heads – especially the collecting of skulls and its impacts – in alpha taxonomy, biological anthropology, and Western science more broadly. We consider how the announcement and overall discovery story of the Taung Child revolutionised our understanding of hominin cranial evolution, but also fit within these skull-collecting objectives and contributed to the palaeoanthropological fixation on the skull. We contextualise this within the history of ‘physical’ anthropology in light of its initial goals in scientific racism, and consider how this process of skull collecting has become normalised in the discipline as a result of this history. As evidence for this, we quantify the possible effects of skull-collecting by collating available data on the number of skulls versus post-crania curated in a representative South African collection and compare the number of skulls versus post-cranial hominin fossils that form part of species hypodigms. We also explore how the ownership of skulls and ownership of narrative in the discipline have been intertwined throughout its history. Finally, we focus on how this early overemphasis on skulls, and especially brain size/intelligence, may have skewed our understanding of human evolution and contributed to ideas of human exceptionalism.

Significance:

- The discipline of palaeoanthropology has a history of skull-focused research rooted in skull collecting and racist research.
- Historical skeletal collections and holotypes of fossil hominins are skull-biased.
- The Taung Child fossil postcranial remains were not included in the original study, which reflects this skull-centrism.
- Palaeoanthropologists need to recognise biases in research choices and the context from which our field developed.

[Abstract in Setswana]

The Taung Child – not just a head

In February 1925, the world was introduced to a fossil declared to be an “intermediate between living anthropoids and [humans]”^{1(p.195)}. The discovery was a juvenile skull, with a well-preserved face and mandible, as well as a relatively complete endocranial cast, and was designated *Australopithecus africanus* (the southern ape from Africa) and nicknamed the Taung Child. The announcement – and publications afterward – failed to mention, however, that the skull was not the full extent of the discovery. There were also associated postcranial remains. In the “rock mass containing the facial fragment”, the “distal ends of the forearm bones and the small phalanges were present”, wrote Australian-born Raymond Dart.^{2(p.22)} Dart, who had spent weeks preparing the skull using his wife’s sharpened knitting needles, “strove to develop [the postcrania] without success, as they were so friable”, adding that “portions are still visible in the stone”^{2(p.22)}. While preparing phalanges is undoubtedly significantly more difficult than preparing a skull, the decision to take the preparation no further (as well as the uncertainty around the location of that block of stone to this day) reveals an interesting truth: the skull itself was privileged.

In a science that emerged three-quarters of a century earlier from a European fascination with measuring human skulls in the service of scientific racism, the skull had long held much attention.³ Focusing on humans’ large brains as a defining feature of evolutionary history, 19th-century European naturalists sought to glean information ranging from cognitive capacity to geographical history and even degree of “morality” from the shape of skulls.⁴ This partiality to anatomy above the neck was apparent in the discussions of the earliest fossil finds, beginning with the original Neanderthal individual from Feldhofer Cave unearthed in 1856 – the first fossil hominin to gain recognition as an ancient human ancestor. As the specimen rose to scientific importance, debates centred on the “thoughts and desires” that once dwelt within the cranium, and replicas of only the partial cranium circulated across Europe, leaving the associated postcrania behind as a footnote in Germany.⁵

This skull-centrism persisted into the 20th century despite a growing fossil record in Europe and Asia, and a recognition that bipedalism (and the significant modifications it made to the skeleton) was a significant evolutionary adaptation. When the juvenile fossil was blasted from a quarry seven miles southwest of the Taung railway station in 1924⁶, the growing evidence for fossil hominins was nonetheless still extraordinarily sparse and piecemeal, and, with the exception of the much younger (now known to be 299 000 years old⁷) Kabwe cranium found in 1921, nonexistent in Africa. Truly ancient-looking finds were rare, partial, and scattered across the globe in ways that made generating narratives challenging, and nothing as old or ape-like as the Taung Child had been found. No consensus existed around topics like where the origin of humankind was located, whether bipedality preceded brain growth, and overall how to recognise a human ancestor.

So when Dart received a block of breccia in late 1924, central questions about human evolutionary history remained open. Yet, despite such uncertainty, certain hypotheses and assumptions were widely subscribed to by

naturalists. The most prevalent assumption centred on the importance – and early emergence – of the large brain. Anatomists like Dart's mentor, Grafton Elliot Smith, hypothesised that an increase in brain size was the *first* distinctively human trait to have evolved, preceding upright walking, tool making, and other adaptations. "It was not the adoption of the erect attitude that made [humans] from an ape", Elliot Smith argued the year before Taung was published, but instead the "gradual perfecting of the brain"^{8(p.39)}. It follows, then, that the skull would be the most important aspect of an ancestor.

Dart, too, favoured the skull in terms of its theoretical contribution, declaring it precisely the piece of anatomy needed to identify a significant, transitional human ancestor. While some others claimed "if missing links are to be traced with complete success, the foot, far more than the skull, or the teeth...will mark them as Monkey or Man"^{9(p.195)}, Dart, agreeing with his mentor, declared this "preposterous"^{2(p.58)}. Instead, the skull told the anatomist everything they needed to know about the creature's character, behaviour, posture, and taxonomic status. Notably, Dart and Elliot Smith agreed on the skull's importance despite disagreeing on the timing and significance of increased brain size. Following Elliot Smith's logic that the brain led the way in human evolution, the Taung Child with its small brain, not to mention its location in Africa, was all wrong as a candidate for human ancestor. Yet, as a neuroanatomist, Dart argued that the *organisation* of the brain revealed that *Australopithecus* had "shot ahead of all apes in intelligence"^{2(p.210)}. Thus, Dart elevated his specimen to a position of prime importance *despite* its small brain – seemingly a feature that would preclude it from an important evolutionary role. Indeed, he turned the small brain size around to be the central significance of the fossil. This illustrates that, regardless of the theoretical commitments a scientist had about the expansion of brain size, the skull was seen as the key to unlocking the human evolutionary story.

The Taung Child clearly contributed to the palaeoanthropological fixation on the skull, but the head-collecting objectives of the discipline go well beyond this important find. In this article, we use the discovery of the Taung Child as a jumping-off point for further interrogating the focus on skulls in alpha taxonomy and its history in racist research. We demonstrate that skull-centrism in palaeoanthropology is widespread, as evidenced by a skeletal inventory from a well-known historical South African human skeletal collection, as well as what bones comprise type specimens of currently recognised hominin species, and that this has impacted hypothesis generation and narrative construction in the discipline.

Heads on a mantle, scientific racism and taxonomy

How can we understand the privileging of the skull in palaeoanthropology through the lens of the Taung Child and what can we learn from such

skull-centrism? Importantly, this theme pervades the entire story, as the Taung skull even found its way to Dart through *another* skull, that of a cercopithecoid monkey loaned by Mr E.G. Izod, Director of the Rand Mines. That specimen had sat proudly on the mantle of Pat Izod's home, the son of E.G. Izod, to be recognised by anatomy student Josephine Salmons and brought to Dart at the University of the Witwatersrand, instigating his interest in the area.^{1(p.195),10(p.40)} This cercopithecoid skull was not only an important moment in the history that led to the Taung Child discovery, but also its placement, as a curiosity on a mantle, provides a poignant image that exemplifies the history of skull collecting in scientific pursuits. This skull-centric approach was consistent with the history of 'physical' anthropology, and we would argue that the process of head collecting has remained normalised in the discipline as a result of this history.

The long sordid history of body (skeleton) and especially head (skull) collecting is intertwined with Euro-colonial conquest, dehumanisation, and white supremacy.^{11,12} Beginning in the late 18th and into the early 19th century, colonial violence extended beyond conquest and colonial expansion to the looting of objects of cultural significance, collecting of specimens of natural history importance, and the acquiring of humans (including body parts, skeletons, and living people) from colonies as trophies (e.g.^{13–15}), curiosities, exhibitions, and scientific study^{16–19}. The collection of human remains through grave robbing, murder, trophy-collecting and warfare, served a dual purpose for colonisers and colonial explorers.^{20,21} First, it was used as a method of subjugation and a grotesque exertion of colonial power (e.g.²²), and second, it was central to the scientific advancements of these colonial powers at a time when race science was being developed. These human remains were considered important "scientific" evidence for the inferiority of Indigenous peoples to justify their colonisation, enslavement, and genocide¹⁵, with anthropologists, physicians, and anatomists involved in their study, and the skull as the main subject of interest.³

Building on the previous taxonomic classification of *Homo sapiens* into four racial "subspecies" (as well as a fifth category that has been called a racist and "non-geographical grab-bag", *Homo monstrosus*²³) by Carl Linnaeus in his *Systema Naturae*²⁴, Johann Blumenbach divided living humans into five human groups based on the study of his large collection of skulls^{25–27}. Although there is disagreement about whether Blumenbach himself was an active participant in race science and therefore a proponent of the superiority or inferiority of certain races (as argued by Junker²⁸), his classic image of five human skulls in a row, with the Georgian "Caucasian" individual in the centre – reflecting a Eurocentric prejudice – inspired the development of race science alongside methods of craniology, craniometry and phrenology. This iconography also features prominently in early physical anthropology works (Figure 1).

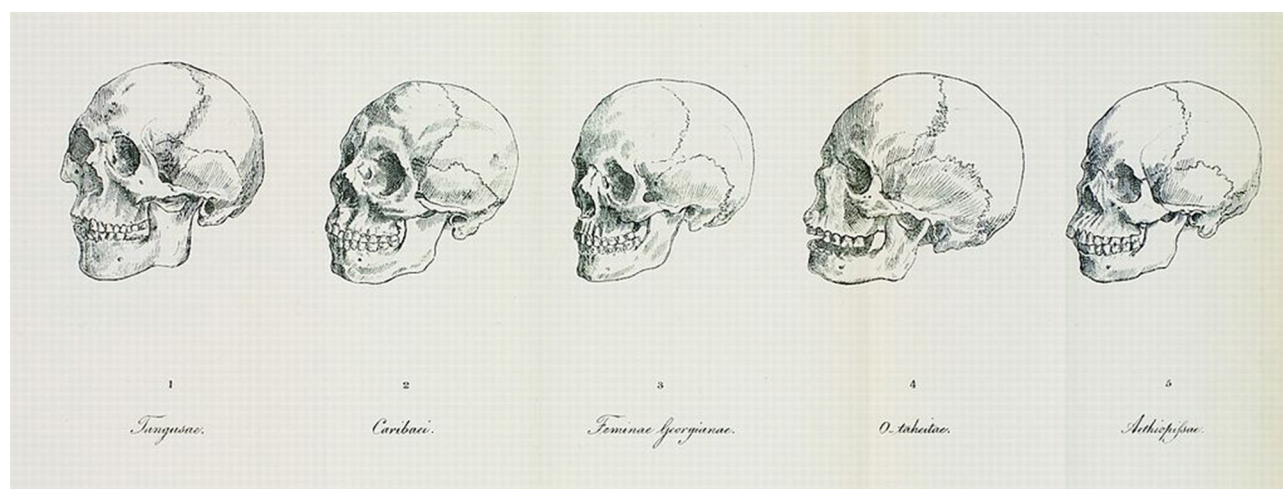


Image source: Johann Friedrich Blumenbach, public domain, via Wikimedia Commons.

Figure 1: Blumenbach's five skulls²⁷, labelled *Tungusae*, *Caribaei*, *Feminae Georgianae*, *O-taheitae*, and *Aethiopsae*, depicting his characterisation of Mongolian, American, Caucasian, Malayan and Ethiopian races.

Early physical anthropology in the 19th century was seen as a way to scientifically validate race, defined as a physical disposition, as well as the complete race complex, which also included behavioural, intellectual and character differences between human groups.^{29–33} At this time, the skull was considered the key to understanding human races and behaviours.³⁴ Essentialist ideas from phrenology (the idea that mental traits/faculties could be predicted on the basis of scalp morphology) influenced the belief that the brain's faculties, including character strengths and weaknesses, revealed themselves through the skull.³⁵ Although phrenology lost its appeal and support in the mid-19th century, concepts spilled over to physical anthropology and its racist and typological beginnings.

One major debate that raged during this time, rooted in Euro-Christian theology, was whether human races were of monogenetic or polygenetic origin. Monogenists believed that there was a common origin for races in the deep past (and that some had “degenerated”) whereas polygenists argued for different origins and therefore different species.³⁶ To find evidence for these different viewpoints, scientists required vast collections of skulls to study. These were systematically collected by all means necessary and subsequently commodified and traded through international colonial trade networks.¹⁵ Museums and other academic institutes in Europe and their settler colonies amassed thousands of human remains obtained from the latter, with skulls making up the majority of these collections. This skull bias reflects the importance placed on skulls for racial typology, but also the durability and transportability of skulls compared to other skeletal elements.¹⁴ Prized in these collections were the “near-extinct primitive races” that were decimated through colonial warfare and disease; another level of colonial dehumanisation.²⁰ For example, in the USA, physical anthropologist Samuel Morton, inspired by Blumenbach's five skull based races, acquired a large collection of crania ($n=867$ when he died in 1851¹³) to provide evidence, through measurement of cranial features and cranial volume, for the polygenetic origin of races and the idea that Indigenous people (Americans in his case) had smaller brains and therefore lower intelligence.³² Morton relied on an extensive network to collect these crania, which were acquired through grave looting and warfare.^{15,37}

When Charles Darwin published *On the Origin of Species* in 1859 promoting a monogenetic view of humans³⁸, it triggered an even greater investigative frenzy among scholars of race to test and/or refute this theory, as most at the time followed the polygenetic school of thought³⁹. It is important to note here that monogenetic views were not necessarily non-racist. Even Darwin, whose theory of evolution via natural selection seemingly supported a monogenetic origin, argued in *The Descent of Man* in 1871 that, although there was common descent, the differences between races through geographic isolation were subspecific and each subspecies had different mental faculties – a reflection of his bias as a 19th-century Eurocentric scientist⁴⁰ (as discussed in detail by Fuentes⁴¹). With Darwin's theory of evolution, specifically the evolution of humans from an ape ancestor, what also occurred was a conceptual change from the horizontal view of Blumenbach's skull forms to a “vertical ranking of Blumenbach's varieties”^{42(p.234)} by many scholars, which essentially created a hierarchy of humanness⁴³. Thomas Huxley's influential view that there was a bigger difference between human races than between the lowest or most “primitive” race and great apes⁴⁴, which was supported by the writings of Ernst Haeckel⁴⁵, epitomised this change, leading to the widespread proliferation of scientific racism. The pre-Darwinian skull-centric anthropology now had an evolutionary framework.

Skulls and their power

Collections of human remains across the world ballooned in the late 19th and early 20th centuries. As a way to legitimise the scientific study of race (and racism), quantitative statistical methods for examining human differences became popular⁴⁶, necessitating greater sample sizes – a trend that occurred in conjunction with the gradual growth of the fossil record of human evolution. Scholars at the time needed examples of “primitive” human races for their “evolutionary” analyses and played a prominent role in both the study of Indigenous peoples and the collection and trade of bodies, and especially skulls.¹⁵

Anthropological collections around the world were amassed for race science by powerful researchers in the field, including Samuel Morton (discussed above), Paul Broca and Aleš Hrdlička, who all engaged in dubious collection and preparation practices, and colonial powers such as Germany that violently collected thousands of skulls to populate their research institutes (as described in^{13,15,43,47,48}). The importance of skulls for these scientists was obvious. In his manual, *Directions for Collecting Information and Specimens for Physical Anthropology*⁴⁹, Aleš Hrdlička, the founder of the *American Journal of Physical Anthropology* wrote: “The skull...preserves the zoological as well as the racial characteristics of the individual, and also the general form and size of by far the most important human organ, the brain.”^{49(p.8)} These collections also created a competition amongst colonial powers.²⁰ As Joost Van Eynde notes, “national collections in London, Paris, Berlin and elsewhere in Europe and America competed with one another for these limited human resources”^{50(p.7)}. Collections also provided the necessary data for narrative building in anthropology and beyond, thus giving researchers affiliated with collections power over early theories about human evolution and human variation.

In South Africa, museums and institutes were not immune to this human remains collection frenzy and competition.²⁰ Scotland-born palaeontologist Robert Broom was both collector and trader of human remains in the late 1890s and early 1900s, sending indigenous South African skulls to the University of Edinburgh after sometimes repulsively using his stovetop to prepare the bones.^{17,51} Some of the individuals that he acquired, usually through disturbing means, also ended up at the McGregor Museum in Kimberley, for which Broom served as the unofficial curator, where they were described using a racial typology.^{17,52,53(p.130)} Broom's motivation for his collecting practice was race science and especially craniology, a method he used to argue for the prehistoric nature of living Khoesan peoples.^{51,53}

Louis Péringuey, then curator of Anthropology at the South African Museum, was inspired by comments made in 1905 by A.C. Haddon, president of the British Association for the Advancement of Science, to collect anthropological data on “primitive” native races within colonies that were dying out.⁵⁴ He proceeded to accumulate skeletons for his museum collection through trade, excavation, and grave plundering.^{54,55} Péringuey collected close to 200 individuals, most of them skulls, and together with collaborators analysed this collection under the belief that “Bushmen” essentially represented the missing link between apes and other human races⁵⁶, and separated individuals into different Indigenous types^{20,54,55}. In addition, Péringuey initiated the body-casting programme at the South African Museum to preserve a physical reproduction of these “pure” “dying races”.⁵⁴ These casts were also studied within a racial typology and formed the basis for the controversial “Bushman diorama” that was finally closed in 2001.^{20,57,58}

Raymond Dart was introduced to the idea of human skeletal collections in 1921 as a Rockefeller Fellow visiting Robert Terry in the Anatomy Department of Washington University in St. Louis, USA, just two years before he immigrated to South Africa as the Chair of Anatomy at the University of the Witwatersrand.^{59–62} He also visited the Anatomy Department at Case Western Reserve University in Cleveland, USA.⁵⁹ Both of those institutions had skeletal collections based on cadaver material of known age and sex, and Dart made it a priority to assemble a comparable collection at the University of the Witwatersrand.⁵⁹ For Dart's collection, before 1958, the skeletons came from donations and unclaimed bodies, with a bequeathment programme additionally (and increasingly) contributing to the collection after 1958.⁵⁹ The collection also includes several skulls labelled as having no provenience.⁵⁹ In addition to the skeletal collection, Dart, in collaboration with Lidio Cipriani, also amassed a large collection of facemasks through sometimes questionable and coercive acquisition practices between 1927 and sometime in the 1980s.⁶³ Like the body casts at the South African Museum, they were utilised in typological research and race science.⁶³

Upon Dart's retirement in 1958, the collection was named The Raymond A Dart Collection of Human Skeletons.⁶² Soon after, in 1959, a massive flood in the basement where the collection was stored caused the mixing of bones, affecting a substantial portion of the skeletons.⁵⁹ As discussed

by Dayal et al.⁵⁹, this led to the construction of a new collections facility and the installation of new shelves with a decision to separate the skulls from the postcrania because “a proportionally larger number of researchers had been interested in the study of skulls only”^{59(p.326)}. This illustrates very clearly that the skull-centrism of the discipline extended at least into the 1950s.

Today, an examination of the collection of human skeletons at Iziko South African Museum in Cape Town (previously South African Museum) reveals the extent of this skull-centric bias (Table 1). This collection was further split into those that were accessioned before 1960 and after 1960. About half of the individuals in the collection have accession date information. Of the 1013 individuals, 55% are represented by skull remains, and 45% are full skeletons. Indeed, in her extensive skeletal inventory of individuals housed across seven South African institutions, Tessa Campbell⁶⁴ demonstrated this skull-centrism by showing that skulls are present at a much higher frequency than postcrania (Figure 7 in ⁶⁴).

When split by period, the pattern shows up more obviously before 1960. Out of the 364 skeletons accessioned before 1960, 48% are skulls, and 38% are skulls and postcrania. After 1960, 35% are skulls, and 51% also include postcrania. A chi-square test of independence indicates that the relationship between the date of accession and skeletal element is statistically significant, $\chi^2(2, N = 597) = 9.97, p < 0.01$. This indicates that the skull-centric bias in collecting was more pronounced prior to 1960.

Heads and species hypodigms

In the history of physical anthropology, there is a direct link between scientific racism and its manifestations (e.g. study of living people, skeletal collections, head collecting) and the study of human evolution. In South Africa, this played out very clearly. Not only was Dart growing an extensive skeletal collection of primarily Indigenous Africans, biased towards heads, but he was also deeply involved in studies of living Indigenous southern Africans.^{51,65} The San or “Bushmen” and the Khoes, in particular, had been the subject of scientific curiosity long before the first fossil hominins were found and became a focus of Dart’s research.^{17,20,21,46,51,55} Together with the coelacanth and cycad, the “Bushmen” were seen as “living fossils” – assumed to be unchanged from early human ancestors – and collected and researched as such in southern African museums⁵¹ (and “The fossil complex” as discussed in⁶⁶). Like many other indigenous groups, they were studied, and their bodies collected, because they were believed to be inferior to, and less evolved than, Europeans. As such, they were believed to provide insight into primitive peoples and human evolution.^{46,51} As Witz and colleagues contend, “At the center of this collecting impulse, conducted through the representational machine of the expedition, was the bushman body, promising to enable direct racial connections to be made between the findings of the new sciences of physical anthropology and paleoanthropology, and providing clues to discovering some of the paths of evolution.”^{66(p.183)}

For any new fossil discovery, comparative taxonomic assessments of difference or similarity are made with species hypodigms that revolve around a holotype or “type specimen” – a specimen that serves as a morphological guide for comparisons. When we consider type specimens for hominin taxa – both prior and subsequent to the discovery of the Taung Child – we see that species diagnoses are overwhelmingly made on the basis of craniodental and mandibular material. Supplementary table 1 provides a list of currently used species names in palaeoanthropology and their type specimens, including which bone(s) make up those type specimens. This table was compiled using the Origins nomenclature resource on Paleo Core (<https://paleocore.org/origins>).⁶⁷ The type specimen for every single species is either only a skull or skull fragments (including mandibles/teeth) or includes a skull/fragments as part of the type specimen. This does not mean that the description of the species relies solely on these type specimens; for 22 out of 26 species, or 85%, the type specimens consist of *only* skull remains. Even with the recognition that craniodental preservation in a taphonomic sense is generally better than that of other skeletal elements⁶⁸, meaning we expect more skull remains in the fossil record, this skull-centric alpha taxonomy is true also for recently described species that have been systematically excavated and which include some postcrania (*Homo luzonensis*⁶⁹), and those that have substantial postcranial material (*Homo naledi*⁷⁰). For *H. naledi*, the choice of the holotype is striking, as Berger et al.⁷⁰ discuss at length the “mosaic” morphology evidenced in hominin species with complete skeletons – i.e. some aspects of the skeleton align more closely with one taxon and other aspects with another – cautioning that, “we must abandon the expectation that any small fragment of the anatomy can provide singular insight about the evolutionary relationships of fossil hominins”^{70(p.23)}.

Scientific racism first developed into a legitimate area of inquiry before the discovery of hominin fossils, meaning that the entrenchment of scientific racism into palaeoanthropology occurred in concert with early historical hominin discoveries. Taking this further, the race-based approaches to considering humankind, which is essentially (unjustifiable) taxonomy below the species level for *H. sapiens*, almost certainly influenced decisions to base hominin taxonomy largely on skull morphology. Or said another way, the decision that what was found represented a new species was only confidently made on the basis of skull differences. This makes sense given the importance of heads in race science and the fact that comparative human collections used for species diagnosis were skewed towards skulls. The same “objective scientific” methodologies and measurement techniques/instruments like callipers are also used in both pursuits: to put people in distinct typological categories in the service of scientific racism and to characterise fossil hominins.⁴⁵

But aren’t heads the best for species diagnosis?

Researchers might argue that skulls are simply more taxonomically diagnostic than postcranial remains, which explains our emphasis on them, and that our argument for a connection is therefore correlation but not causation. The supposed lack of phylogenetic usefulness of

Table 1: Skeletal inventory of a South African human skeletal collection

	All individuals	Cranium and postcranium ^a	Cranium and mandible	Cranium only	Mandible only	Total number of skulls ^c	Postcranium only
Iziko ^a (whole collection)	1013	452 (382)	143	364	51	558	116
Iziko (accessioned after 1960)	233	118 (100)	37	29	16	82	29
Iziko (accessioned before 1960)	364	138 (110)	53	99	18	170	44

^aIziko South African Museum in Cape Town, South Africa

^bNumbers in parentheses represent the number of individuals with mandibles

^cTotal includes the number of individuals with only mandibles, only crania, and both crania and mandibles

postcranial morphology is often attributed to the assumption that postcranial morphology is more reflective of function and behaviour, thus increasing the probability of homoplasy specifically in cladistic analyses.^{71,72} However, a large body of research suggests that is not always true, and even historical data suggest that other parts of the skeleton might be as valuable for taxonomy. Studies across multiple mammalian taxa have shown that levels of homoplasy are similar for postcranial, dental and cranial traits, with postcranial traits of the primate skeleton even shown to be less homoplastic than craniodental characters.^{73–75} Postcranial traits have also been successfully used to reconstruct phylogenetic relationships, for example in papionins and hominins.^{76,77} Furthermore, some recent studies of living primates have indicated that other regions of the skeleton, such as the humerus, os coxa, and scapula, would be just as, and sometimes more, effective for species/genus/family differentiation.^{78–82} Studies have also shown a much lower efficacy for some regions of the hominoid skull, including humans, for reconstructing phylogenetic relationships.^{83,84} This is related to the recognition that morphological evolution and divergence have been influenced by multiple evolutionary processes (natural selection, genetic drift, gene flow), and not all traits represent an adaptation (see discussion in⁸⁵). For hominins, this new understanding has highlighted that certain regions of both the skull and postcranium are more reflective of non-adaptive processes, making these regions less subject to homoplasy and therefore better for determining phylogenetic relationships.⁸⁵

For the Taung Child discovery, as discussed above, we know that postcranial material existed, but it not only did not make it into the scientific publication of Taung¹, it appears to have been lost historically. Ironically, finding postcrania of *A. africanus* (Stw 14) ended up being the nail in the coffin for any arguments that this species was not a bipedal human ancestor, demonstrating the importance of postcranial material in this particular instance. More recently discovered hominins like *H. naledi* have also illustrated how important it is to have information from entire skeletons to accurately understand the complex nature of human evolution.⁷⁰ This raises the question: if the postcranial material for Taung had been examined, would acceptance have happened earlier? Or differently? Might it have shifted the hypodigm for the species in a manner that affected how future taxa were evaluated?

As another example, brain size, a characteristic long linked with taxonomy and humanness, and, ironically, the main trait that influenced the initial scepticism about the Taung Child, may not be particularly useful for interpreting either. We now know that hominin brain size did not increase linearly; instead brain size has been variable, within and between taxa, both through time and also in contemporaneous groups from ca. 2 Ma right up to the recent past. For example, *Homo erectus* (sensu lato), and early *Homo* in general, had a wide range of variation⁸⁶, as do living humans (*H. sapiens*). Some large-brained *H. erectus* and small-brained *H. habilis* were contemporaries capable of tool-making, but very different in brain size. Small-brained *H. floresiensis* also lived at the same time (and presumably space) as large-brained hominins, and had cultural capabilities.⁸⁷ Neanderthals had very large (on average) brains – larger than *H. sapiens* – an enigma to palaeoanthropologists, given that historically they were considered less capable despite their large brains (although we now know that is not true⁸⁸).

Conclusion: Why does it matter?

This link between scientific racism, research on bodies, and especially heads, and human evolution studies reframes the story of the Taung Child discovery – and indeed both prior and subsequent hominin species discoveries – in a new way. The discovery is embedded in a history and practice that inevitably impacted the interpretation of the fossil find (see also⁸⁵) and contributed ultimately to the skull-centrism of palaeoanthropology. It is essential that we break the link between racism and human evolution, and recognise the ways in which their interconnectedness has impacted our field and shaped its legacy. Discussions about the ethics of comparative collections, the practice of repatriation and restitution (e.g.^{89,90}), as well as thoughtful critiques of ancestry estimation in forensic science⁹¹, have moved our broader discipline forward and have paved the way for palaeoanthropologists to look inward.

The tendency to centre skulls in palaeoanthropology has affected the lens through which we interpret the past in multiple ways. First, it has potentially skewed the historical trajectory of the field. Focusing on heads and not on postcrania might mean that evidence for human evolution was overlooked or downplayed in its importance, as evidenced, for example, by the disregarding of the Taung postcrania. Second, an overemphasis on skulls has potentially skewed how we narrate the story of human evolution. Palaeoanthropologists have been obsessed with measuring head/brain size and shape, and linking this to intelligence and capabilities, right from the beginning of the discipline, an obsession that comes directly out of race science. The focus has been on why our heads are bigger or smaller (e.g. intelligence), what fuelled it (e.g. meat-eating), and what advantage it gave us (e.g. culture). Large brains are embedded in humanness, even though we now know that even small-brained hominins appear to have had the capacity for culture. Moreover, comparative primatology, and studies of other organisms (e.g. octopus), are telling us that large mammalian brains are not central to intelligence, or may not be directly tied to meat-eating (e.g.⁹²). In this sense, a focus on heads/brains may also have contributed to ideas of human exceptionalism.

Going forward, it is important to recognise the biases that underlie our research choices. Why have we been so insistent on linking brain size to intelligence and capabilities, even in the face of intra- and interspecific variation that illustrates that this is not true? How do we move beyond this skull-centrism? Obviously, with modern techniques, we have the capability to fully examine the entire skeleton. Improved excavation approaches, including the ability to CT scan breccia and the like to identify materials embedded in rocks, give us the capability to identify and prepare (virtually) even the most friable material, including the arm and hand bones of the Taung Child should they ever be located. However, fully moving away from a head-centred approach is going to require a conscious shift in mindset, and the understanding that we risk being typological and essentialist by not shifting our approach. We just have to do it!

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Data availability

Data captured in Table 1 of this study are available on request from the curator of the Iziko South African Museum. Data captured in Supplementary table 1 are freely available via <https://paleocore.org/origins/nomina/>.

Declarations

We have no competing interests to declare. We have no AI or LLM use to declare.

Authors' contributions

L.S.: Conceptualisation, writing – the initial draft, data collection, writing – revisions, data analysis, data curation. P.M.: Conceptualisation, writing – the initial draft. R.R.A.: Conceptualisation, writing – the initial draft, data collection, writing – revisions. All authors read and approved the final manuscript.

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