The Enigma of Raymond Dart

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Introduction

Raymond Dart (1893–1988) is famous for the 1925 discovery of the Taung cranium from South Africa he named *Australopithecus africanus*, and its identification as the first support for Darwin's hypothesis of the African ancestry of mankind. Dart's claims, first rejected, were later seen as one of the great scientific discoveries of the twentieth century. This formed one surviving part of a substantial corpus of wild claims made in Dart's writings. These included the taming of fire; the osteodontokeratic; cannibalism and the killer ape; Boskop man; work on racial origins; on exotic invaders into southern Africa from the ancient Near East, the Mediterranean, and China; on phallic symbols; and Stone Age miners.

Dart's career and work presents the intriguing circumstance of a scientist and writer who challenged science with a daring proposal which was considered false and was later fully accepted as scientifically valid, and used his reputation to forward numerous arguments which could not stand up to scientific scrutiny.[1]

Almost every survey of world prehistory, the "origins of mankind," or the history of palaeoanthropology and archaeology includes Dart's 1925 achievement. Through this discovery, Dart has entered the literature as one of the great scholar-scientists of the era.

Dart's claims were described later that year in *Nature* by a leader in the field, Sir Arthur Keith, as "preposterous,"[2] a view echoed by other researchers. It would take until after the discovery of the Transvaal Australopithecines in the later 1930s before the scientific community began to acknowledge the brilliance and accuracy of Dart's claim, and it was the mid 1940s before the major critics stepped back. But already by that date Dart had become a hero in South Africa, and the boldness and originality of his work built his reputation as one of the great figures in interpreting the human record. The conventional image in print is of a scientist ahead of his time, with a major breakthrough that took two decades for the world to recognize.

It is therefore ironic that in a very productive career of writing, together with numerous public presentations, the majority of themes and arguments that Dart pursued in archaeology and physical anthropology could indeed be described as "preposterous"—

[1] I am grateful for advice and assistance to Graham Connah, Darren Curnoe, Donald Denoon, Saul Dubow, Brian Fagan, Neil Parsons, and not least to Revil Mason for having introduced me to some of the players in this drama. However, none of these are implicated in my conclusions.

[2] A. Keith, "The Taungs Skull," *Nature* 116 (1925), 11.

clearly so in terms of today's knowledge, but many running directly against the methodology, knowledge, and scientific understanding of his own time. While Dart's description of *Australopithecus* seems methodologically scientific, his analysis was one of many interpretations in his body of work made with less than strictly scientific methodology, but one that proved sustainable through the later scientific research of others.

Most current references to Dart's role are brief and reverential.[3] This paper seeks to interpret the enigma of a scientist who doggedly pursued numerous lines of argument seen as false and misguided, but one of which—the identification of *Australopithecus africanus*—has created his lasting reputation. The career of Raymond Dart, and the fate of his views, raise questions about the nature of science in early twentieth-century "colonial" culture and the particular world of white South Africa's emerging ideologies. We argue that the phenomena of Dart's broad-ranging hypotheses in archaeology, biological anthropology and beyond do not have a single cause. They reflect the intersection of his personality, his own non-metropolitan background, his eccentric influences, and the interpretative models of the inter-war period (especially on race), with a white South Africa that embraced the opportunity for a new role in world science alongside specific ideological needs to reinforce its social structure and identity. They also serve to raise questions about the boundary between science and pseudoscience.

"Man of Grit"

Raymond Dart was born in Brisbane, Australia—dramatically so, during the flooding of the town in 1893. Attending Ipswich Grammar School, he initially followed his family's strongly religious and fundamentalist views, and decided to become a medical missionary. However, before moving to study medicine at Sydney University, he accepted a scholarship to study science at the University of Queensland and here, brought into contact with both zoology and geology, he moved away from his fundamentalist assumptions and changed his worldview, seeing "the discrepancies between Fundamentalism and the facts"[4] and accepting an evolutionary model.

He continued to Sydney University in 1914 to study for his medical degree. A resident of St Andrew's College, his contemporaries included another great Australian in the history of archaeology, Vere Gordon Childe (a tutor at the college whose radical views led to opposition that forced his resignation) and the future Australian Labor foreign minister and UN pioneer H.V. Evatt, with whom Dart wrote a student article.

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[3] A detailed, but uncritical and hagiographical, narrative biography of Dart was published as F. Wheelhouse and K.S Smithford, *Dart: Scientist and Man of Grit* (Sydney: Transpareon Press, 2001), complementing Dart's own memoir, R.A. Dart and D. Craig, *Adventures with the Missing Link* (London: Hamish Hamilton, 1959), and other sources (P.V. Tobias, *Dart, Taung and the Missing Link* (Johannesburg: Witwatersrand University Press, 1984). Critical assessment in print of Dart's career is limited: an important article published thirteen years ago by Saul Dubow ("Human Origins, Race Typology and the Other Raymond Dart," *African Studies* 55 [1996], 1–30), and briefer mention in a book by the same author (S. Dubow, *Scientific Racism in Modern South Africa* [Cambridge: Cambridge University Press, 1995]).

[4] Wheelhouse and Smithford, *Dart.*

At the very start of his medical studies Dart was able to attend the 1914 meeting of the British Association for the Advancement of Science held in Sydney. Here he heard the (Australian born) Grafton Elliot Smith (1871–1937), whose reputation as a distinguished anatomist is accompanied by his infamy (to archaeologists) as a leading proponent of hyper-diffusionism, of which Glyn Daniel has written "why does the world tolerate this academic rubbish?"[5]

Elliot Smith became a crucial influence on Dart's career, providing him with opportunities for employment but powerfully idiosyncratic outlooks on human prehistory. Dart attributed to Elliot Smith his leaning towards these interests, noting in 1929 that "anthropology in recent years has received a great stimulus through the "Diffusionist theory" of Elliot Smith relative to cultures."[6]

Dart was clearly an outstanding student. He took on a job of University Demonstrator in 1917 while still studying, but with the Great War still being fought, in 1918 he joined the army as a Captain (aged twenty-five), his ship stopping off at Durban and Cape Town to give him a first sight of South Africa where he was to spend most of his life. As the war ended soon after Dart's arrival in London, he stayed to take up a position as Elliot Smith's assistant at University College London, teaching anatomy but also beginning a program of research in medicine that could have led his reputation in a quite different direction. While in London, Dart was able to examine in 1922 the Broken Hill fossil from Northern Rhodesia (now Kabwe in Zambia), which had been found the previous year.[7]

It was to Elliot Smith that Dart owed the appointment that made his career and life in South Africa. In January 1923—aged only twenty-nine—he moved to South Africa to take up the position of full professor of anatomy in the medical school of the University of the Witwatersrand in Johannesburg (the university had received its charter in 1922), which was to be his home for the next sixty-five years until his death in 1988 at the age of ninety-five. He long remained active in writing, public presentations of his work and support of research that followed his own enthusiasms, with fieldwork privately funded through the Bernard Price Institute of Palaeontological Research (founded 1945) and other bodies.

Taung and Australopithecus

Dart's career in Johannesburg fulfilled a valuable role in developing medical teaching—he was dean and head of the medical school for eighteen years. However there was a major shift in his research interests. As he was to explain:

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[5] G. Elliot Smith, *The Ancient Egyptians and the Origin of Civilization* (London and New York: Harper, 1911); G. Daniel, *The Idea of Prehistory* (Harmondsworth, UK: Penguin, 1964).

[6] R.A. Dart, "The South African Negro," *American Journal of Physical Anthropology* 13 (1929), 309–18, 315.

[7] Wheelhouse and Smithford, *Dart*, 48.

> The abysmal lack of equipment and literature forced me to develop an interest in other subjects, particularly anthropology, for which Elliot Smith had fired my imagination.[8]

He added that "here in Johannesburg, as with Elliot Smith in Cairo, bones had to be studied instead of brains. Physical anthropological issues screamed for initiation in this stupendous continent of Africa."[9]

Of Dart's papers published to 1974,[10] a broad categorization suggests topics in medicine and anatomy numbered five out of six to 1923, seven out of thirteen to 1924, but only 5 percent (twenty-four papers) to 1974, compared to fifty-nine in physical anthropology and ninety-four in archaeology.

His first paper in this area[11] was on "Boskop man," a topic we consider further below, and he completed several papers in archaeology and physical anthropology before the *Australopithecus* article that marked him for international fame.

The story of the discovery of the Taung skull is well known and is now part of the history, even the folklore, of studies of early man. In brief, Dart encouraged his students to collect fossils, and one of these students, Josephine Salmons, brought in a fossilized baboon skull found at a lime works quarry in Taung(s) in the then northern Cape Province (today's North West Province). Dart showed this to geologist colleague R.B. Young who arranged for further samples of bone-bearing breccia to be brought from Taung. It was one of those that contained the famous Taung child skull.

The timetable of events has been reconstructed by Tobias.[12] The breccia containing the skull was handed to Dart on 28 November 1924, and he began work on 1 December to free the fossil from the rock. The South African teaching year had already finished for the summer, and fortunately this year Dart was not involved in external examining. The cleaning process took three weeks and was completed around 23 December, but clearly during the physical procedure Dart developed his unambiguous hypothesis that this was an early hominid, quite different from any found to date in Africa and evidence to support Darwin's hypothesis of the African origins of man. In another seventeen days he completed his description, comparison, analysis, the naming of *Australopithecus africanus*, and the bold statement that it represented "an extinct race of apes intermediate between living anthropoids and man ... an extinct link between man and his simian ancestor." The article was despatched together with its illustrations on 6 January 1925 (six weeks after the

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[8] Ibid., 58.

[9] R.A. Dart, "Associations With and Impressions of Sir Grafton Elliot Smith," *Mankind* 8 (1972), 171–75.

[10] Wheelhouse and Smithford, *Dart*, 331–43; M. Dart, "Raymond A. Dart—List of Publications 1920–1967," *South African Journal of Science* 64 (1968), 134–40; I. Fischer, *Professor Raymond Arthur Dart: A Bibliography of His Works* (Johannesburg: University of the Witwatersrand Department of Bibliography, Librarianship, and Typography [cyclostyled], 1969).

[11] R.A. Dart, "Boskop Remains from the South-East African Coast," *Nature* 112 (1923), 623–25.

[12] Tobias *Dart, Taung*, 16–34, correcting some errors by Dart and Craig, *Adventures*.

arrival of the find) to catch the boat to England; it reached the editor of *Nature* on 30 January and with the initial encouragement of Keith and other scholars—the "refereeing" seems to have been by telephone[13]—*Nature* published it on 7 February 1925.[14] Indeed, Dart responded to local journalistic enquiries certain that the paper would be published in *Nature* by that date.

Such a process implies a rare confidence. Solly Zuckerman assessing this event wrote sarcastically of the "fossil ape-like skull which, presumably by divine guidance, Dart immediately recognized as the 'missing link'..."[15] and was skeptical that one could use purely visual impressions for a diagnosis of relationships of animal bones. The hypothesis was remarkable on two grounds. There was no reliable stratigraphic dating to provide a chronological framework for the find. Indeed this has remained a problem[16]; Dart quotes identifications of the limeworks deposit as "probably Pleistocene"[17] though he had thought it Pliocene.[18] The ancestral claim was primarily on morphological grounds and, since this was the skull of a child of about 5 years, the more difficult for comparative purposes. Further, the location, in the open dry lands of South Africa, contrasted starkly with the forest environment of Africa's great apes that had inspired Darwin's 1871 prophesy about the African origins of man.

In the cautious scientific world of the twenty-first century it is instructive to note this accelerated time scale of the exercise that led to the discovery and announcement of *Australopithecus*. It makes an interesting contrast with the timetable for the announcement of the most important and exciting recent hominin discovery, that of *Homo floresiensis*. There the key skeletal material was discovered in early August 2003, and the scientific study began on 22 September 2003.[19] The definitive articles reporting these finds were sent and received by *Nature* on 3 March 2004 (only five-and-a-half months later, held up to await additional dating evidence). They were reviewed that month positively but with recommendations for additional information, analyses, and CT scans that led to further work on the material. The revisions of the two articles were resubmitted and accepted on 18 August and 8 September—but only published on 28 October 2004 as Morwood noted, one year, one month, and one week after the analysis began. [20]

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[13] Tobias, *Dart, Taung*, 37.

[14] R.A. Dart, "Australopithecus Africanus: The Man-Ape of South Africa," *Nature* 115, 2884 (1925), 195–99 (reprinted in *South African Journal of Science* 64 [1968], 51–57).

[15] S. Zuckerman, *From Apes to Warlords* (London: Hamish Hamilton, 1978), 15, 45.

[16] Tobias, *Dart, Taung*, 38–39.

[17] Dart and Craig, *Adventures*, 50–51.

[18] R.A. Dart, "The Status of Australopithecus," *American Journal of Physical Anthropology* 26 (1940), 167–86.

[19] M. Morwood and P. van Oosterzee, *The Discovery of the Hobbit* (Sydney: Random House, 2007), 111, 118, 122, 182–87, 229.

[20] P. Brown, T. Sutkina, M.J. Morwood, R.P. Soejono, Jatmiko, E. Wayhu Saptomo, and Rokus Awe Due, "A New Small-Bodied Hominin from the Late Pleistocene of Flores, Indonesia," *Nature* 431 (2004), 1055–61; M.J. Morwood, R.P. Soejono, R.G. Roberts, T. Sutikna, C.S.M. Turney, K.E. Westaway, W.J.

In *Nature* a week after Dart's announcement, the four leading British scholars in the field commented on the claims: Keith, Elliot Smith, Smith Woodward and Duckworth.[21] In general they praised Dart's description of the material but put on hold their acceptance of his claims and classification while awaiting the full publication of the material. Keith doubted the creation of a new family, seeing *Australopithecus* as the same genus or sub-family as the chimpanzee and gorilla, and noted the need for geological evidence to settle its relationship. Elliot Smith too grouped the find with the African great apes and sought geological dating.

Doubts continued to be expressed about the claims made by Dart, and those who had supported their publication began to distance themselves from his conclusions. Most startlingly Sir Arthur Keith, once he had studied casts of the finds in London, wrote in *Nature* in July 1925: "An examination of the casts exhibited at Wembley will satisfy zoologists that [Dart's] claim is preposterous."[22] He was referring specifically to Dart's claim for a new family and a position intermediate between living anthropoids and man.

"Preposterous" is a strong word in science. It should be remembered that at this time Keith was a leading proponent of the role of Piltdown Man, even if one rejects suggestions that he was directly implicated in the fake.[23] And it was Keith who was to publish a detailed account of the *Australopithecus* skull, leaving Dart's own monograph unpublished.[24] Dart issued a shorter description of the teeth but his further publications on the find were mainly about its significance, rather than more detailed scientific studies.

What confirmed Dart's claims was the discovery of further Australopithecines by Robert Broom and others in the southern Transvaal cave sites of South Africa from the mid 1930s onwards. These gave support to the hypothesis generated from Dart's single, juvenile, undated skull, and confirmed in the wider scientific world the high reputation that Dart had gained among his local South African supporters. W. Le Gros Clark was influential in securing acceptance at the Pan African Congress of Prehistory in 1947, and that year Sir Arthur Keith formally acknowledged Dart's claim.[25] Only in 1959 would Dart release (co-authored with Dennis Craig) his book length public account of the achievement of discovering, identifying, and defending the claims for *Australopithecus* at Taung.

Rink, J.-X. Zhao, G.D. van den Bergh, Rokus Awe Due, D.R. Hobbs, M.W. Moore, M.I. Bird, and L.K. Fifield,"Archaeology and Age of a New Hominin from Flores in Eastern Indonesia," *Nature* 431 (2004), 1087–91.

[21] A. Keith, G. Elliot Smith, A.S. Woodward, and W.L.H. Duckworth, "The Fossil Anthropoid Ape from Taungs," *Nature* 115 (1925), 234–36.

[22] Keith, "The Taungs Skull," 11.

[23] P.V. Tobias, "Piltdown: An Appraisal of the Case against Sir Arthur Keith," *Current Anthropology* 33 (1992), 243–93.

[24] Dart and Craig, *Adventures*, 64.

[25] A. Keith, "Australopithecenae or Dartians," *Nature* 159 (1947), 377.

Makapansgat and the Taming of Fire

Dart re-entered the area of detailed scientific work on *Australopithecus* with the finds at Makapansgat, in the northern Transvaal. Indeed, only five months after the Taung announcement, Dart noted the apparent presence of carbon in bone assemblages from the site and stated "there seems little doubt from the evidence available that the bone-bed is the 'kitchen-midden' result of human occupation at a remote epoch."[26] But it was over two decades before he could test this bold statement. In a field project initially led by Phillip Tobias (who would become Dart's protégé), and continued under Dart's staff, Australopithecine fossils were discovered from 1947 onwards and described in great detail (and without challenge) by Dart in a series of technical articles. Ironically he first ascribed them to a species different from both the Taung and the southern Transvaal sites, as *Australopithecus prometheus,* This pattern of a new species for a new find is typical of the fate that has befallen many hominin fossil finds at the hands of their discoverers.[27] Dart is also widely credited with suggesting the name *habilis* for *Homo habilis*.[28] In due course the Makapansgat finds would be considered by most scientists to belong to the same species as the Taung child, *A. africanus*.

Dart's named his hominid finds as *A. prometheus* because he saw the use of fire as another skill of the early hominid community. Some of the vertebrate bones from the site were considered to contain free carbon, which he attributed to the deliberate use of fire by human predators:

> The special significance of the Makapansgat valley limeworks deposits in unravelling these early human mysteries lies in their being true hearths and thus providing information ... concerning man's hunting skill, his probable weapons and his use of fire.[29]

Subsequent research and discussion has not supported Dart's claim for the human use of fire by *Australopithecus* at Makapansgat, or indeed for the presence of fire, and at least some of the blackening has been explained by manganese.[30] While there is still active debate about the dates for the first controlled use of fire, the claims for Makapansgat are not even considered.[31] In due course Dart seems to have backtracked on his certainty here.[32]

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[26] R.A. Dart, "A Note on Makapansgat: A Site of Early Human Occupation," *South African Journal of Science* 22 (1925), 454.

[27] R. Derricourt, "Patenting Hominins: Taxonomies, Fossils and Egos," *Critique of Anthropology* 29 (2009), 193–204.

[28] P. Tobias, *Into the Past: A Memoir* (Johannesburg: Picador Africa, 2005), 218.

[29] R.A. Dart, "The Makapansgat Proto-Human Australopithecus Prometheus," *American Journal of Physical Anthropology* 6 (1948), 259–83, 275.

[30] B. Wood, "An Interview with Phillip Tobias," *Current Anthropology* 30 (1989), 215–24, 216.

[31] S. James, "Hominid Use of Fire in the Lower and Middle Pleistocene: A Review of the Evidence," *Current Anthropology* 30 (1989), 1– 26.

[32] Dart and Craig, *Adventures*, 157–58.

More strangely, Tobias has stated[33] that Dart's confidence in the hominid source of fire at Makapansgat had persuaded him to identify a fossil baboon skull as *Australopithecus prometheus* two years before the actual *Australopithecus* was found, and to write a paper for this claim which he withdrew before publication.

It was, however, the Makapansgat site which led to one of Dart's most controversial claims, that of the Osteodontokeratic.

Osteodontokeratic Culture and Cannibalism

The most famous of Dart's unaccepted claims was that the faunal assemblages which included the Makapansgat Australopithecines reflected a complex pattern of human selection (rather than accumulation by predators), deliberate fashioning, and use as systematic equipment of tools and weapons. Since he applied this to the fashioning of bone, tooth and horn he linked them by defining an "osteodontokeratic" culture, describing a "Bone Age" which preceded the "Stone Age," for no stone with signs of use were found with the Makapansgat breccia. This theme became the focus of Dart's lectures and enthusiasm, with numerous articles as well as a major monograph arguing the case.[34] In his personal memoirs he devotes far more space to this topic than to his landmark discovery and identification of *Australopithecus* at Taung.

What led to the osteodontokeratic hypothesis was the non-random occurrences of animal parts and the fractures on many of these. This persuaded Dart that the sample showed deliberate selection and preparation for tool use: saws or scrapers from teeth, use of long bones for clubs and so on. Individual bones he interpreted as tools of quite specialized function, including a dagger,[35] and even platters, bowls and drinking cups made from skulls.[36] Dart developed detailed descriptions of hunting strategies, including breaking open water turtles, clubbing animals and hamstringing them on the run. He saw the damage to baboon skulls as evidence of "well aimed blows on the head with some sort of weapon," with the use of clubs to cause a double fracture. He went on to suggest that the Taung hominid had also slain the fossil baboons found there. He weakened his argument by hyperbolic language about the bloodthirsty regime reflected in these finds, and this led to hard lines being drawn between antagonists on discussions of human nature. "Bludgeoning was characteristic of all South African man-apes." The use of weapons in hunting he suggested was as much cause as effect of hominid bipedalism.[37]

Since there was damage to some *Australopithecus* skulls, similar to that seen on baboon skulls, Dart went further to argue that the victims of the hunters included fellow

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[33] Wood, "An Interview," 215–16.

[34] R.A. Dart, *The Osteodontokeratic Culture of Australopithecus Prometheus* (Pretoria: Transvaal Museum Memoir 7, 1957).

[35] R.A. Dart, "Further Light on Australopithecine Humeral and Femoral Weapons," *American Journal of Physical Anthropology* 17 (1959), 87–94.

[36] R.A. Dart, "From Cannon-Bone Scoops to Skull Bowls at Makapansgat," *American Journal of Physical Anthropology* 20 (1962), 287–95.

[37] Dart and Craig, *Adventures*, 114, 201.

members of their species. Cannibalism in early man he defended as probable in the light of later anthropological and historical evidence on modern mankind.

The osteodontokeratic became a matter of faith for Dart's followers, who could see signs of human usage by looking at the materials, much as "eolith" stone tools from the Pliocene had been supported in Europe and elsewhere. It was an interesting hypothesis and it had deeper impact, for it led to the popular image of man's nature as the killer ape, popularized in writings such as Robert Ardrey's *African Genesis*.[38] The idea was always controversial and while accepted by some prominent prehistorians, it was felt by many scholars to be unsupported by the evidence. Indeed the vigor with which Dart repeated arguments for the osteodontokeratic reflected his awareness of the skepticism with which it was greeted by most scholars and scientists.

However non-human explanations for the non-random accumulation—including hyena lairs and leopard predation—continue to be accepted as the most likely source of the selective process.[39] Later reconstructions suggest that the use of carnivore teeth on their prey created the impression of the "well aimed blows to the head." But Dart engaged in vigorous debate with his critics, and challenged from the start the carnivore explanation. Unfortunately much of the debate was in terms of strongly held beliefs and passionate arguments, and may merit revisiting. The osteodontokeratic dominated Dart's last years of his teaching career; he published his major study in 1957 and "retired" from the University staff in 1958 aged sixty-five. But his research and writing activity continued vigorously for much of the remaining thirty years of his life.

Boskop Man

Dart's first article in the fields of palaeoanthropology and archaeology had been published in *Nature* in 1923, the year of his arrival in South Africa: a survey of the available evidence for a "Boskop" race.[40]

Although now vanished from the narrative of hominin evolutionary history, Boskop Man, identified from discoveries made in the Transvaal in 1913 (and defined by Robert Broom in 1917 by the species name *Homo capensis)*, flourished under Dart's tutelage for some time. The concept of "Boskop Man" was applied to remains seen as predating those of the Bushmen (San) and the "Strandloper" community of coastal food collectors (assumed to be another extinct racial group), with a larger brain capacity than these more recent groups. Dart published a description of "Boskop" finds from the southern Cape Province, identifying them as a race previously occupying all Southern Africa.[41] At this stage he was cautious about their affiliation, noting similarities with both Neanderthaloid

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[38] R. Ardrey, *African Genesis* (New York: Atheneum, 1961).

[39] R.K. Brain, *The Hunters or the Hunted?* (Chicago: Unversity of Chicago Press, 1981); D.L. Wolberg, "The Hypothesized Osteodontokeratic Culture of the Australopithecines," *Current Anthropology* 11 (1970), 23–37; P. Shipman and J.E. Phillips, "On Scavenging by Hominids and Other Carnivores," *Current Anthropology* 17 (1976), 170–72.

[40] Dart, "Boskop Remains."

[41] Ibid.; Wheelhouse and Smithford, *Dart*, 57.

and with more advanced Cro-Magnon specimens from Europe, and not committing to recognising a separate species *Homo capensis.*

Evidence of interbreeding or survival of "Boskop" traits came to influence interpretation of other communities in both the fossil record and living communities, so that a skull might even be described as a Bush-Boskop-Bantu hybrid.[42]

At one level Boskop Man may be seen as no more than a classificatory framework which outlived its usefulness. The broader the range of available skeletal material to study, the weaker the case for this group, so that physical anthropologists came to side with the critics of the term. In a short but definitive review of the issue in 1958, Ronald Singer noted that "it is still a failing among not a few anthropologists ... to plan vast migration routes of so-called prehistoric 'races' which are represented only by odd skulls."[43] After a thorough dissection of the entity Singer concluded "it is now obvious that what was justifiable speculation (because of paucity of data) in 1923, and was apparent as speculation in 1947, is inexcusable to maintain in 1958." The concept of Boskop Man was complicated by each new find: at the Cave of Hearths, another site in the Makapan Valley, a mandible was described both as Boskopoid and as Neanderthaloid.[44]

In his critique of "scientific racism," Dubow[45] sees a deeper problem, in the search for a pre-modern "race" which combined physical and cultural attributes. Boskop man was quite different from the contemporary Bushmen (San) of Southern Africa, who were at times seen as a hybrid of Boskop Man and a *H. sapiens* ancestor. In this interpretation, Dart was locked to a paradigm of typological identity which created straitjackets into which it became increasingly difficult to fit the actual bodies.

Racial Types

The human biology, prehistory and history of Southern Africa were long dogged by a model which Dubow[46] has grouped as "scientific racism"—broadly speaking, a taxonomy of distinct biological races of man, with the assumption that physical race, language and culture are inextricably linked, and with an extension that may connect behavioral characteristics to these groupings—Dart interlaced the "childlike" physique of the Bushmen with their "childlike" behavior.[47] In the 1920s such views were not unusual; in

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[42] R.A. Dart, "Recent Discoveries Bearing on Human History in Southern Africa," *Journal of the Royal Anthropological Institute* 70 (1940), 13–27.

[43] R. Singer, "The Boskop 'Race' Problem," *Man* 58 (1958), 173–78. The trend at times remains; see R. Derricourt, "Getting 'Out of Africa': Sea Crossings, Land Crossings and Culture in the Hominin Migrations," *Journal of World Prehistory* 19 (2005), 119–132.

[44] R.A. Dart, "The First Human Mandible from the Cave of Hearths, Makapansgat," *South African Archaeological Bulletin* 3 (1948), 98.

[45] Dubow, *Scientific Racism*, 56–58; Dubow, "Human Origins."

[46] Dubow, "Human Origins."

[47] Ibid., 32.

some South African historiography a linked classification survived into the 1970s and even 1980s, despite the artificiality of the model.[48]

Such a typology stretched the evidence. Dart could not argue for pure physical races but rather for admixture: he described the Bantu tribes of the upper Zambezi and South-West Africa "of an extremely mixed character with a dominating admixture of Bushman blood, and certainly strongly impregnated with Semitic and other Caucasian as well as Mongolian blood."[49] In describing three "Strandlopers" from Namibia (former South-West Africa) he makes comparison with Bush and Boskop types but adduces, as with the Southern Kalahari Bushmen, "contamination not with the African Negro but rather with the brown and Mongolian stocks that are ethnically foreign to South and Central Africa."[50]

Of course Dart was not the only scientist of his generation to identify distinct racial groups, and then find large samples forced them to a complex pattern of admixture to explain variance. "I showed that the Bantu are constituted from a Bush and Negro matrix, but that before they fused, the Bush race had already been infiltrated with brown (Mediterranean) racial elements and the Negro with Nordic elements. Further, for the last thousand years or more, Asiatics of both Armenoid and Mongoloid character have been absorbed into the racial complexity which confronts us in the modern African population."[51]

An attempt to pull all this together exposed the limitations of the methodology. In his contribution on "Racial origins" to Schapera's 1937 survey of African cultures of Southern Africa[52]—astonishingly, still reprinting as late as 1959—Dart conceded that neither European nor Bantu nor Bush is a pure race in South Africa, intermingling with Indians, Malays and other orientals. However his narrative attempts to reconstruct a sequence of population movements that were increasingly complex and improbable: a Boskop race derived from previous admixtures, a Bush race arriving from the north and hybridising with the Boskop, the introduction of Mongoloid elements from Indian Ocean trading but more widely dispersed Semitic traits from northern ("Armenoid") origin. The Bush race had influence from ancient Egyptians that showed why the Bush-Hottentot languages were so intimately related to the Hamitic group of languages.[53] Facial features

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[48] M. Wilson, *The Thousand Years before Van Riebeeck*, Sixth Raymond Dart Lecture (Johannesburg: Witwatersrand University Press, 1970); R.M. Derricourt, "Classification and Culture Change in Late Post-Pleistocene South Africa," in C. Renfrew, ed., *The Explanation of Culture Change: Models in Prehistory* (London, Duckworth, 1973), 625–31.

[49] R.A. Dart and N. del Grande, "The Ancient Iron-Smelting Cavern at Mumbwa," *Transactions of the Royal Society of South Africa* 19 (1931), 379–427, 421.

[50] R.A. Dart, "Three Strandlopers from the Kaokaoveld Coast," *South African Journal of Science* 51 (1955), 175–79.

[51] Dart, "Recent Discoveries," 22.

[52] R.A. Dart, "Racial Origins," in I. Schapera, ed., *Bantu-Speaking Tribes of South Africa: An Ethnographic Survey* (London: Routledge and Cape Town: Maskew Miller, 1937), 1–37.

[53] Ibid., 22.

of the Negroid African populations of southern Africa he calculated as 51.2 percent Negroid, 25.0 percent Bush, 22.3 percent Caucasoid and 1.5 percent Mongoloid. When this otherwise valuable book finally went out of print, Tobias wrote the introductory chapter to its successor and stated clearly "a microtaxonomy of sub-Saharan peoples [is] most difficult if not impossible."[54]

Within this model the sites of Mapungubwe and Bambandyanalo in the Limpopo Valley on South Africa's northern border, explored from 1932 onwards, were a particular challenge, associating African culture (linked to the Great Zimbabwe complex) with "Bush-Boskop" human remains. Dart declined responsibility for analysing the skeletal material, but was involved in their interpretation, classifying the site as "pre-Negro"[55] and therefore further support for the non-African framework for the stone ruins of southern Africa. Elsewhere he suggested an influence "foreign to Africa and probably Mongolian" in one of the Bambandyanalo skulls.[56]

Foreign Influences on African Culture and People

A major theme in the worldview of European settler communities in southern Africa has been that, as they perceived the indigenous peoples to be uncivilized, non-African influences were held responsible for features that contradicted this. Dart was fascinated by the model of cultural diffusion associated with his mentor Grafton Elliot Smith. In the battles over interpretation between the new archaeological research and the traditional settler view of these exotic origins and links, Dart's cultural diffusionist ideas reinforced those of the settlers.

Dart issued a manifesto of his hyper-diffusionist views in *Nature* in March 1925, only the month after announcing *Australopithecus africanus*. It is interesting that these wild hypotheses seem not to have damaged his credibility in palaeoanthropology where his critics evaluated his views on their own terms. Yet his March 1925 paper is astonishing in its boldness and in its claims.[57] Here he lays out clearly his views of the southern African links with, and influence from, the civilizations of the ancient Near East and elsewhere, weaving a selection of data chosen from within what, by then, was already a strong sequence of more scientific prehistoric information. Following his visit in 1927, Miles

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[54] P.V. Tobias, "The Biology of the Southern African Negro," in W.D Hammond-Tooke, ed., *The Bantu-Speaking Peoples of Southern Africa* (London: Routledge, 1974), 3–45, 11.

[55] Dart and Craig, *Adventures*, 71–72; Wheelhouse and Smithford, *Dart*, 184–85; see also Dubow, "Human Origins," 16–19.

[56] R.A. Dart, "A Hottentot from Hong Kong: Pre-Bantu Population Exchanges between Africa and Asia," *South African Journal of Medical Science* 17 (1952), 117–42, 125–26.

[57] R.A. Dart, "The Historical Succession of Cultural Impacts upon South Africa," *Nature* 115 (1925), 425–29.

Burkitt[58] would write a major survey of South African prehistory, followed the next year by the definitive study from Goodwin and van Riet Lowe.[59]

One stimulus to Dart was claims for Babylonian or Phrygian hats in the rock paintings of the Later Stone Age in the Kei valley in the Eastern Cape—an interpretation that has no supporting evidence in the wider range of rock paintings or the excavated sequence of the region.[60] Dart paraphrased this as "the scene of the rape of a naked Bush girl by clothed foreigners wearing Babylonio-Phrygian headgear" seeing this also as the arrival of outside metallurgists into a stone-age society.[61] Woven into the narrative of exotic links are isolated coin finds, place names, a photograph of a Zulu woman with ancient Egyptian headgear, and a panoply of unrelated and selected miscellanea that lie far from a calm scientific and testable methodology. Thus two wild hypotheses under the same authorship were accepted for publication in *Nature* within six weeks: the first would be seen as one of the greatest scientific breakthroughs of the twentieth century, the other lies on the furthest shores of pseudoscience.

It is an old joke that archaeologists see sexual symbolism in anything round or long that cannot otherwise be explained, so it is unfortunate that Dart put this into practice. He saw sexual symbolism in the bored stones of southern Africa,[62] and phallic symbols elsewhere (though he noted that such interpretation was not accepted by the leading prehistorian of South Africa A.J.H. Goodwin). He rejected as inadequate the explanation of bored stones as weights for digging sticks. (We now recognize that objects may have been created by Later Stone Age communities and collected for symbolic or other amuletic purposes by later African farmers.) Dart took the argument further in tracing phallic influences associated with the Mapungubwe and Zimbabwe cultures, which "appeared to have reached Southern Africa from Egypt, Mesopotamia, or India, perhaps from all three, along with perforated stones upwards of 6,000 years ago."[63] Dart traced southern African perforated stones and stones with phallic significance back to ancient Egypt, including a link to predynastic maceheads. Phallic-shaped objects were also connected with the Phoenicians.[64]

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[58] M. Burkitt, *South Africa's Past in Stone and Paint* (Cambridge: Cambridge University Press, 1928).

[59] A.J.H. Goodwin and C. van Riet Lowe, *The Stone Age Cultures of South Africa, Annals of the South African Museum* 27 (Cape Town: South African Museum, 1929).

[60] R.M. Derricourt, *Prehistoric Man in the Ciskei and Transkei* (Cape Town: Struik, 1977).

[61] Dart and del Grande, "Ancient Iron Smelting," 403.

[62] R.A. Dart, "Phallic Objects in Southern Africa," *South African Journal of Science* 26 (1929), 553–62; R.A. Dart, "A Chinese Character as a Wall Motive in Rhodesia," *South African Journal of Science* 36 (1939), 74–76; R.A. Dart, "The Ritual Employment of Bored Stones by Transvaal Bantu Tribes," *South African Archaeological Bulletin* 3 (1948), 61–66.

[63] R.A. Dart, "Rhodesian Engravers, Painters and Pigment Miners of the Fifth Millennium," *South African Archaeological Bulletin* 8 (1953), 91–96, 94.

[64] R.A. Dart, "Further Data on the Origin and Phallic Character of Conical and Perforated Stones," *South African Journal of Science* 29 (1932), 731–41, 737.

These influences were dated to early in the southern Africa record, and Dart identified specific symbolism "in Southern Rhodesia and ... South Africa so intimately associated with ancient mythology of Predynastic Egypt that they must be related to one other.... The bearers of those [Mediterranean] cultures brought with them to South Africa not only their stone tools and aquatic ways of life but also their stories and myths."[65]

Dart returned regularly to themes of exotic linkage. He could write

> we are now in a position to state that the whole of the eastern portion of the African continent for some hundreds of miles inland ... was exploited by the *old colonists* ... from South-west Asia in remote ancient time ... these very ancient voyagers not only visited these territories and carried off their denizens, particularly their women, but also intermarried with them and settled down amongst them, bringing to them novel arts and customs.[66]

Other connections are seen: early Chinese voyagers' links with the east Africa coast from as least as early as the first millennium BC; different Chinese links with southern Africa,[67] including Chinese hats as well as Phrygians are found in the rock paintings, and also ancient Egyptians (headgear has a lot to answer for), with the innovative suggestion that the land of Punt in ancient Egyptian texts may have lain south of the Zambezi. Dart also referred to a mysterious undated "galley" found near Cape Town, a find that has not been recorded in the literature.

The stone ruins and associated finds of the Limpopo basin loomed large in these discussions and in particular the site of Great Zimbabwe stimulated explanations of exotic origins. These had been undermined by the archaeological fieldwork undertaken by Randall-MacIver in 1905 and reinforced by Gertrude Caton Thompson in 1929. This work positioned the material solidly within the African cultures, which would subsequently be labeled Iron Age, built by African communities.[68]

Dart clashed in person with Caton Thompson at the 1929 meeting of the British Association for the Advancement of Science held in Johannesburg.[69] In her privately published autobiography she gives an account of this debate, quoting a rather partisan sounding report in the *Cape Times*: "He [Dart] spoke in an outburst of curiously unscientific indignation.... After further remarks delivered in a tone of awe-inspiring violence ... he stormed out of the room ... Miss Caton Thompson disposed of him allusively and effectively in a brief reply." [70] Dart's memoirs concede to the conflict of

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[65] R.A. Dart, "Paintings that Link South with North Africa," *South African Archaeological Bulletin* 18 (1963), 29–30.

[66] Dart, "Historical Succession," 426.

[67] Dart, "A Chinese Character."

[68] M. Hall, "'Hidden History': Iron Age Archaeology in Southern Africa," in P. Robertshaw, ed., *A History of African Archaeology* (London: James Currey; and Portsmouth NH: Heinemann, 1990), 59–63.

[69] Dubow, "Human Origins," 99.

[70] G. Caton Thompson, *Mixed Memoirs* (Gateshead: The Paradigm Press, 1983), 130–36.

ideas[71] but indicate his preferred model. "The distribution of ancient copper, tin and gold mines in Southern Africa, along with the comparison that could be made between bronze made in the Transvaal and the bronze statue of Pepi I of the 6th Dynasty [of Egypt] ... and the bronze gates of Shalmaneser in Assyria, demonstrated the ancient nature of the mining background to Rhodesia's ruins." But he was also willing to emphasize Arab influence rather than more ancient sources, going beyond most proponents of that view in seeing the links as from the pre-Islamic Arab world.[72] He visited Great Zimbabwe for the first time in 1930, with a follow up visit in 1935, by when he came to favor a Phoenician influence for the ruins.[73]

A more extreme view—because it mixed his expertise in physical anthropology with his archaeological interests—was the claim of wider Asiatic influence on both the cultures and populations of Southern Africa. An undated pendant from near Makapansgat was identified because its unusual form gave further evidence of "foreign contacts of great antiquity."[74] First argued in 1925, he repeated his views on foreign influence from the fifth millennium BC over a generation later.[75] Here he clearly identifies the influences on (Northern) Rhodesia from the maritime intercourse of Egyptians, Sumerians, and Indians with a port of entry on the eastern coast of Africa.

Dart's proselytizing of non-African influence on African culture was well outside his area of expertise. It was however a passion. He held to diffusionist views about cultural influences and sought physical evidence to support this. In 1929 he wrote of the need for anthropometric survey of Bantu peoples separated into their tribes. "By such a survey properly carried out, my belief concerning Egyptian, Semitic, Arabic and Mongoloid infiltrations into the population ... could be determined or rebutted."[76]

As the holder of a chair in anatomy, he had to be taken more seriously in writing on the physical anthropology of African peoples, and his argument for Asiatic genetic influence on Southern African indigenous groups reflected his interest in cultural exchanges. He identified Mongolian features among the San (Bushmen)—influences brought in by an Indian Ocean trading and sailing route. He first began to see Mongolian features in a Kalahari visit in 1936, to select Bushmen, whom he described as "living fossils," for "exhibition" in Johannesburg.

In 1943 Dart suffered a nervous breakdown, but he recovered with renewed energy. He developed an ambition to write a major work about invasions from Europe into the fertile Crescent of the Near East[77] but this project seems not to have been fulfilled.

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[71] Dart and Craig, *Adventures*, 68–71.

[72] Wheelhouse and Smithford, *Dart*, 118.

[73] Ibid., 203.

[74] R.A. Dart, "A Polished Stone Pendant from Makapansgat Valley," *South African Archaeological Bulletin* 4 (1949), 83–86.

[75] Dart, "Rhodesian Engravers."

[76] Dart, "South African Negro," 315.

[77] Wheelhouse and Smithford, *Dart*, 229.

Perhaps Dart's most ambitious use of supposed biological date for revising the narrative of human prehistory is a presentation he gave as his presidential address to the South African Archaeological Society in 1951.[78] This complex, bold, and detailed paper, astonishing today in its claims, must have seemed already at the outer edges of science to the Society's leaders, who included the pioneers of scientific archaeology in the region. Although the Society published it, with funding provided by Dart's university, subsequent literature has ignored this aberrant work. The paper is a reminder that developing a complex and sophisticated analysis from a totally flawed hypothesis can only produce flawed results. Dart accepted an argument advanced 20 years earlier by Laurence Snyder that "if any people shows blood-group frequencies similar to a group of peoples not related to it, the conclusion may be drawn that the former traces back to the latter somewhere in its ancestry, or else the former has undergone crossing with the latter group or some similar people." He then used comparisons of the percentage of different blood groups in peoples throughout the world to create a detailed sequence of population movements—from northern Europe to South Africa, from the Nile Valley to Australia, from the Philippines to the Americas, within a chronology for four major migrations stretching from 7000 BC to 100 AD. These stages saw the successive "negritization," then "caucasianization," then "indonesianization" of the Orient. Such a model would be dramatic as a set of general hypotheses; as a detailed narrative rewriting of prehistory it is quite remarkable. To Dart "blood-groups provide our only clue to the hereditary pattern of races at the dawn of written history"; but the scientific world chose to rely on a broader range of evidence and bypass this dramatic claim.

Dart echoed this theme of improbable migrations in an article unambiguously named "A Hottentot from Hong Kong"[79] in which purely anatomical evidence is used to back the case for long distance migration. But here he sees reverse genetic movement "to demonstrate that Boskop (Hottentot) types as well as Bush (Pygmy) types had been dispersed from Africa eastwards as far as China at some time in the prehistoric past of this continent." He echoed a general impression of Mongolian features in both Bush (San) and Bantu (Negro) populations of South Africa. But he was able to make direct comparisons between Hong Kong Chinese from skulls available to him, and local skeletal specimens, comparing especially one Chinese skull with those of "Hottentot" skulls from the Eastern Cape.

While admitting that a single skull is a weak basis for a grand hypothesis, Dart made claims for skeletal links between Mongoloid and southern African materials, invoking "racial intermingling or hybridisation of Mongolians with the pre-Bantu inhabitants of Africa."[80] He argued this should not cause surprise because "there is ample evidence that Mongolian peoples came to Africa regularly by sea during the Sung and Ming dynasties" and asked "at what time... when the East African coast was free from true

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78 R.A. Dart, African Serological Patterns and Human Migrations (Claremont: South African Archaeological Society, 1951).

79 Dart, "Hottentot from Hong Kong."

80 Ibid., 136.

negroes—the Bush-Hottentot inhabitants of East Africa were in nautical contact with Mongoloid peoples."[81] He continued to argue that "an unrecorded sea-traffic which was more Mongolian than Mediterranean ... once dominated the East African coast ... more remote in time than either King Solomon or Queen Hatshepsut.... The ancient process of sea-traffic in the Indian Ocean ... carried Pygmy peoples eastwards and was thus responsible for the negritisation of the Orient." He was a little more circumspect in noting the parallels between "ships" of Sarawak and one from Okavango in Namibia.[82]

This and other selective evidence fed into Dart's early view that there was "an endless procession of emissaries of every great navigating power" to South Africa in pre-European times with the Indian Ocean routes bringing Asiatics to Southern Africa.[83] He clearly held to this view for much of his life—a line of argument diametrically contradictory to the line of development of scientific archaeology, even before the contribution that could be made by modern genetics.

We now know, of course, that a complex network of Indian Ocean trade has linked the African farming communities of the east African coast to the wider world for more than two millennia. Ironically, in what might be seen as a return to some of Dart's themes from a different angle, it has now been claimed by Felix Chami[84] that pre-Iron Age communities also had external links, and he has raised the question of earlier links with the north of the continent, as beyond to the east. The archaeological evidence for such possibilities has only emerged very recently and will require further assessment.

Mining before the Metal Ages

Very early in Dart's South African work he was developing theories about mining that linked the subcontinent to the ancient civilizations of the old world. In June 1924, he argued in *Nature* that the pre-European mining of southern Africa could be attributed to "an ancient people," with a hint that the source of nickel found in the bronzes of ancient Egypt and Mesopotamia might be sought in this region.[85] Five years later he advanced the argument more boldly, stating that the scale of the mining would "preclude any belief that the products of the industry were consumed by a local population."[86] This confirmed his views of southern Africa as the probable source of nickel in the bronze of the ancient Near East, and the presence of the bronze age with "the actual presence there at a remote age of skilled and intelligent craftsmen from a superior cultural area." Noting distant biological influences into the southern African native populations, he concluded, "there can be little

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[81] Ibid., 137–38.

[82] R.A. Dart, "Death Ships in South West Africa and South-East Asia," *South African Archaeological Bulletin* 17 (1962), 231–33.

[83] Dart, "Historical Succession"; Dart and Craig, *Adventures*, 74.

[84] F.A. Chami, "Diffusion in the Studies of the African Past: Reflections from New Archaeological Findings," *African Archaeological Review* 24 (2007), 1–14.

[85] R.A. Dart, "Nickel in Ancient Bronzes," *Nature* 113 (1924), 888.

[86] R.A. Dart, "The Bronze Age in Southern Africa," *Nature* 123 (1929), 495–96.

question that the South African Bronze Age synchronizes with the Bronze Ages of the nearest ancient cultures, namely, those of Egypt and Sumeria."

Dart's enthusiasm for such debates on a wider range of topics in African prehistory was encouraged by the opportunity to join the eight month Italian Scientific Expedition through Africa in 1930, during which he visited the ruins of Great Zimbabwe which stimulated his support of the Elliot Smith diffusionist model. In Zambia he began one of his most persistent lines of argument, one that he continued until late in his life, that for ancient mining in the Stone Age. At Mumbwa Caves from excavation of cave deposits he and his colleagues claimed that Late Stone Age communities (with a picture of continuing Middle Stone Age artefact styles and indeed the persistence of handaxe technology) had been miners of metal. Slag materials associated with LSA burials and artefacts were identified as showing "traces of iron"[87] and this led the group to a conviction that these hearths represented slag of furnaces used to smelt iron: "the oldest-known iron foundry in the world."[88] Recognizing the conflict of this model with the associated Stone Age culture he decided that indigenous labor must have been used by non-indigenous miners. On the absence of any iron finds from the Stone Age deposits "they might be explained by their having rusted away ... the more likely explanation is that the metal ... was too precious for any of it to be lost"[89]—a useful explanation for archaeologists wishing to prove any theory!

Within three years independent tests suggested the "slag" was a cemented cave deposit, ironically the excavators' first hypothesis,[90] and the iron finds were naturally occurring minerals.[91] Further work at this site demonstrated a sequence of Later Stone Age settlement into the first millennium AD, though possibly acquiring pottery from Iron Age neighbors, followed by Iron Age settlement around the eleventh century AD, and with some admixture of deposits.[92]

The ancient mining theme continued at the manganese mines in Chowa near Broken Hill (Kabwe), which he thought demonstrated contemporaneity with Mumbwa. Like many mines exploited in the twentieth century this mine showed signs of pre-European use but with ambiguous cultural associations, and Dart concluded that "the manganese mining community were predominantly Stone Age people" with the same mixed cultural material as at Mumbwa.[93] The mixture of material he explained by arguing that metal seekers and manganese gatherers of foreign origin, familiar with the uses of

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[87] Dart and del Grande, "Ancient Iron Smelting."

[88] Wheelhouse and Smithford, *Dart*, 145.

[89] Dart and del Grande, "Ancient Iron Smelting," 419.

[90] Dart and del Grande, "Ancient Iron Smelting," 382.

[91] Wheelhouse and Smithford, *Dart*, 188.

[92] R. Derricourt, *Man on the Kafue: the Archaeology and History of the Itezhitezhi area of Zambia* (London: Ethnographica, and New York: Lilian Barber Press, 1985), 239–47.

[93] R.A. Dart, "The Discovery of a Stone Age Manganese Mine at Chowa, Northern Rhodesia," *Transactions of the Royal Society of South Africa* 22 (1934), 55–70.

manganese, arrived among Stone Age people using "very primitive" types of Early Stone Age implements. He considered this manganese mining pre-dated the Neolithic mines of western Europe.

For both sites Dart developed the view that substantial mining had been undertaken by Stone Age communities working for an external trade, and led by visitors from the Mediterranean: "the obvious channel for that cultural migration was the eastern coast-line, the sea and the water highways ... when the people came...they arrived in a Moustierian community which had not yet been released from the trammels of Acheulian influences."[94] For making metal with furnaces, "either the metal-gatherers instructed the local inhabitants in that technique, or brought with them followers expert in that technique.... they founded their metallic enterprise amidst an old palaeolithic culture."

He also argued that there had been a search for pyrolusite to be exported for glass making in the Near East. He allocated a chronology of 4000–2000 BC to this mining and the primary link hinted at in the article was back to Ancient Egypt, though he was more cautious in putting this in print. The symbolism of haematite as a representation of blood explained the early haematite quarrying back to the Middle Stone Age.[95]

We see here the influence of Elliot Smith's hyperdiffusionism with its primacy for Ancient Egypt. Such writing from others than Dart might have been ignored in the 1930s as a sideline of eccentricity. But, given Dart's reputation in South Africa from his Australopithecine discoveries, his articles on both sites went straight into the distinguished pages of the *Transactions of the Royal Society of South Africa.*

Early mining returned later in Dart's life. In 1934 Dart first heard of finds of ochre on artefacts at Border Cave in Swaziland and he pursued the idea of ancient ochre mining at a site he dated to the Middle Stone Age.[96] Excavations under Dart's mentorship waited until much later when his protégés Adrian Boshier and Peter Beaumont made controversial claims for archaeological work in Swaziland from the late 1960s[97] continuing the traditions of advancing ideas outside the conventional. Dart and Beaumont announced these results from haematite workings at Ngwenya (Bomvu Ridge) as evidence for iron ore mining initially. They initially dated this nine millennia old and later dated the antiquity of mining to least 28,000 years old, and possible older.[98] They emphasized continuity with the mining claims for Chowa, reinforcing Dart's views of a foreign mining group. "The claim made almost 35 years ago, that 'manganese was being deliberately mined in Zambia

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[94] Dart and del Grande, "Ancient Iron Smelting," 400, 423.

[95] R.A. Dart, "The Birth of Symbology," *African Studies* 27 (1968), 15–27.

[96] Wheelhouse and Smithford, *Dart*, 189–91.

[97] Wheelhouse and Smithford, *Dart*, 266–70.

[98] R.A. Dart, "The Antiquity of Mining in Southern Africa," *South African Journal of Science* 63 (1967), 264–67; R.A. Dart and P. Beaumont, "Amazing Antiquity of Mining in Southern Africa," *Nature* 216 (1967), 407–408; R.A. Dart and P. Beaumont, "Evidence of Iron Age Mining in Southern Africa in the Middle Stone Age," *Current Anthropology* 10 (1969), 127–28; R.A. Dart and P. Beaumont, "On a Further Radiocarbon Date for Ancient Mining in Southern Africa," *South African Journal of Science* 67 (1971), 10–11.

by a foreign people familiar with its potentialities in Late Stone Age time' ... have been fully justified."[99] These claims have not generally been accepted by the archaeological community. However the Swaziland research did make one claim that would last: that for the early first-millennium origins of the Iron Age in southern Africa—where Castle Cavern produced fifth century AD radiocarbon dates.[100]

Explaining the Enigma of Dart's Work

Raymond Dart generated multiple hypotheses and interpretations across the boundaries of archaeology, palaeoanthropology and biological anthropology, most of which were not sustainable, and many of which were dismissed or ignored by fellow scientists when they were made. The one has stood the test of time—*Australopithecus africanus*—seems the exception, by good fortune as much as critical methodology.

Such an assessment is at odds with the biographical studies, which either take all Dart's work at face value[101] or select the minority which has had lasting use.[102] A critical interpretation also needs to go beyond that of Saul Dubow's discussion of Dart and "scientific racism."[103] We argue that the explanation for Dart's ideas, their persistence and their popularity outside of the scientific community can be attributed to the intersection of several factors, especially the nexus of Dart's personality and background with the society in which he worked for most of his life. South Africa was receptive to ideas that would not challenge the racial categories that reinforced perceptions of power and difference—from the past as well as the present. But it needed the individual whose personality, interests and influences could deliver this.

The primary emphasis of Dubow's study was "the role of ideology in the creation and maintenance of white supremacy during the inter-war years" in South Africa.[104] He is therefore defining the context, and arguing for an effect of, some of Dart's work, but explores only part of the explanation for it. Dubow's conclusions are broadly true but not a complete explanation. Dart was a physical anthropologist working after the Great War. In this period the discipline was grounded in a belief in racial typology, as a classificatory system and a practical approach to interpreting study materials: "the underlying premises of inter-war physical anthropology took notions of innate racial difference for granted."[105] This continued world wide, alongside a widespread scientific enthusiasm for eugenics, until the rise of Nazism encouraged scientists to re-examine and abandon these approaches.

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[99] Dart and Beaumont, "Amazing Antiquity."

[100] R.A. Dart and P.B. Beaumont, "Iron Age Radiocarbon Dates from Western Swaziland," *South African Archaeological Bulletin* 24 (1969), 71.

[101] Wheelhouse and Smithford, *Dart*.

[102] Tobias, *Dart, Taung*.

[103] Dubow, *Scientific Racism*; Dubow, "Human Origins." See G. Štrkalj, "Where was Raymond Dart Wrong?" *African Studies* 57, 1 (1998), 107–111 for a critique of Dubow.

[104] Dubow, *Scientific Racism*, 1995, ix.

[105] Ibid., 287.

Operating in the relative intellectual isolation of Johannesburg from 1923, Dart may have lagged behind some of the challenges and changes to the established approaches in physical anthropology, but he had not been responsible for creating them.

"Scientific racism" is not inevitably associated with practical racial discrimination. Dart though never actively political is credited with opening the Wits Medical School to non-white students, and with criticising discriminatory policies.[106] Early in his South African years he stated publicly there was no justification in biology for intolerance on racial grounds.[107]

It happened that, for white South Africa, a racial typology model reinforced assumptions, political needs and economic structures in the interwar years. Then, following the National Party victory in 1948 and the gradual definition of the apartheid system, ideas of racial typology hardened in South Africa as they were being dissolved in science, but Dart was neither involved in nor responsible for those trends. Academics cannot take all the blame for the misuse of their ideas. In the apartheid era, Dart's followers could comfortably distance themselves from the most extreme racial paradigms and Dart could concentrate on different topics such as the osteodontokeratic.

Dart's enthusiasm for exotic origins and links in the past of the African continent, especially his challenge to the African origins of Great Zimbabwe, reinforced white prejudices and was echoed in Southern African white communities well into the 1970s. Isolated from European culture at the furthest end of a vast continent, historical links to ancient Mediterranean civilizations were immensely reassuring. But his early major claim for *Australopithecus* demonstrated the *African* origins of mankind. This was not just a challenge to those who saw Asian origins from the finds of *Homo erectus* (Pithecanthropus), but also the priority for Europe implied by the find of Piltdown Man from England, only exposed as a fake in 1953.

Further, Dart's actual studies of humans—from skeletal remains or living individuals—struggled to fit real evidence into the distinct racial typology, leading constantly to explanations of hybridity, as we have shown above. His own empirical research chipped away at the validity of distinct racial classifications, although he was loath to admit it.

The local acceptance in South Africa of Dart's views may also reflect the nature of "colonial science." In the early twentieth century, Britain's dominions (and not least Australia and South Africa) were anxious to demonstrate that they could be contributors to scientific research, not just consumers of it from London.[108] Students would still go from Australia, South Africa or elsewhere to the metropolitan heartland to acquire research training, but the young academic institutions of the dominions needed to demonstrate their

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[106] Tobias, *Dart, Taung*: 14; Dubow, *Scientific Racism*, 1995: 45–46; Dubow, "Human Origins," 11–12; F. Wheelhouse, *Raymond Arthur Dart: A Pictorial Profile. Professor Dart's Discovery of "The Missing Link"* (Sydney: Transpareon Press, 1983), 18.

[107] Dart, "Note on Makapansgat," 79.

[108] S. Dubow, *A Commonwealth of Knowledge: Science, Sensibility and White South Africa 1820–2000* (Oxford: Oxford University Press, 2006).

strengths. The Australian Dart helped put South African science on the world map, and scientific achievement on the Southern African map.[109] White South Africa in the 1920s and 1930s was a fertile ground for someone willing to give the region a new role and status in world science, and the Taung find showed South Africa could house scientific research of world importance.

In 1925 Jan Smuts, Prime Minister until the previous year, specifically selected for praise the role of human palaeontology in South Africa.[110] Dart's discovery led to his immediate rise in status. Already a full professor at 29, he was made Dean of the Medical School within months of his discovery, and other honors followed and continued for the subsequent decades. In time Dart's status grew such that public criticism by others in the field was muted and indirect; in his later decades of work scientists were unwilling to say in print what they thought in private. In exploring Dart's relations with other scientists, full use has yet to be made of the Dart papers at the University of the Witwatersrand.[111]

The disadvantage of such a pioneering role is of course isolation. The opportunities to test ideas among colleagues in the same disciplinary areas were few, though colleagues in other disciplines were encouraging. But what led an Australian with medical training, placed in an isolated and under-resourced teaching position in South Africa, to play such an iconoclastic role and across so many fields and topics?

We must look in part to his personality to explain his approach to the fields of archaeology and physical anthropology. Having rebelled at university against his parents' fundamentalist religious beliefs, he continued to be a rebel (though some might suggested he endorsed a new fundamentalism).

In his co-authored autobiography Dart wrote:

> I may be asked how it is possible in following the feckless hobby of an amateur detective to know where the trail will lead or what will prove the most valuable clue in the solution of human mysteries? Usually what helped me most was the general agreement of a lot of other people that I was on the wrong track! Knowing the fallibility of human opinion, especially popular opinions or dogmas adopted without satisfactory reasons, it generally proved valuable to explore the reverse of the accepted view.[112]

An element here might be the brashness of the outsider to a world of science dominated by metropolitan Europe: the independent Australian character. Sir Arthur Keith would criticize Dart for "his flightiness, his scorn for accepted opinion, the unorthodoxy of his outlook."[113] More politely, Tobias describes "his tendency to overstate the case" alongside "his willingness to free his mind from the shackles of authority ... a man rich in

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[109] Dubow, "Human Origins," 6–7.

[110] Dubow, Commonwealth of Knowledge, 207.

[111] G. Štrkalj, "Review of Dart: Scientist and Man of Grit," *PaleoAnthropology* 1 (2003), 35–36.

[112] Dart and Craig, *Adventures*, 241–42.

[113] Quoted in Dart and Craig, *Adventures*, 31.

idiosyncrasies, a born actor with overwhelming charisma."[114] But what began as a radical approach to issues in prehistory would be seen as adherence to discredited ideas: instead of looking forward to new but untested ideas, looking backward to discredited ones.

Part of the explanation for Dart's approach is the baleful influence of Sir Grafton Elliot Smith (1871–1937), to whom Dart attributed his interest in anthropology. Elliot Smith's excursions from his professional field of anatomy into the more exotic fields of archaeology marked him as a major "hyper-diffusionist" (in Glyn Daniel's account of this direction of argument). He put especial emphasis on the role of Pharaonic Egypt in the generation of world cultural trends: the view that civilization was not independently acquired but spread from a single source. In Daniel's analysis[115] Elliot Smith, the research scientist in anatomy, "abandoned any pretence at scientific method...his theory was formed and everything was squeezed into this theory." Daniel continues, "Why does the world tolerate this academic rubbish...? First there is a deep-seated desire for a simple answer to complicated problems."

In an article after his retirement Dart acknowledged how when he first encountered Smith: "he was now through his discoveries in Egypt revolutionizing our knowledge of how culture had spread throughout the world."[116] Tellingly, he notes that Elliot Smith bequeathed his library to Raymond Dart: they would form part of the University of Witwatersrand Library.

If Elliot Smith was a major influence on Dart seeking to create a reputation in anthropology and archaeology, Phillip Tobias was a major influence on maintaining that reputation through and beyond the last decades of Dart's life. Because of the high regard in which Tobias has been held—and continues to be held—his championing and defence of the Dart reputation has had real impact. Tobias was Dart's protégé and choice as his successor as professor of anatomy; he too became dean of the Witwatersrand Medical School. Tobias remains one of the "greats" in modern palaeoanthropology and physical anthropology, and his reputation has been further extended by his principled political and social stand during the apartheid years of South Africa, starting with his elected role as president of the progressive National Union of South African Students immediately after the election of the white Nationalist government. Not many fossil-hunters have been a significant student political leader as well as director of a major medical school! Tobias' work, as South Africa's leading physical anthropologist, actually contributed indirectly to undoing many of Dart's ideas especially on racial classification[117] but Tobias remained a strong public champion of his mentor and "father-figure." Tributes by Tobias to Dart include a major accolade and an obituary where, acknowledging that Dart's

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[114] Tobias, *Into the Past*, 216–7.

[115] Daniel, *Idea of Prehistory*, 88–107.

[116] Dart, "Associations."

[117] Tobias, *Into the Past*, 68.

osteodontokeratic hypothesis had been largely rejected, he credited him nonetheless with creating the discipline of taphonomy as a result.[118]

Finally some of Dart's continuing influence must be attributed to his personal charm and charisma alongside the awe in which he was held, although many early students may have "dismissed him as him 'mad'...."[119] As a source of encouragement, resources and institutional support Dart built and maintained a large circle of protégés and admirers, not always to the liking of the newer generation of professionals.

The Nature of Scientific Advance

Much of this story demonstrates the sometimes tenuous link between hypothesis and proof. Scientific method is ideally derived from the generation of hypotheses and their subsequent testing. But the testing, the replicability, varies between different sciences. In archaeology some hypotheses are readily testable, because the database is large, but other hypotheses lack multiple sources of evidence. Thus Dart could generate an extreme hypothesis, but if the sources for testing were limited (a sole Australopithecus site, the Great Zimbabwe ruins, the iron working in the sites of Zambia) it could remain neither validated nor invalidated for some time.

While Dart's publications included solid descriptive material in anatomy, physical anthropology and archaeology, this paper argues that his interpretative themes—most pursued doggedly throughout his life—represented a less than scientific approach. One of these themes—the identification and position of *Australopithecus africanus*—has been accepted as a contribution to science while the others have been left behind. We have attempted to explain the framework in which a promising anatomist took and maintained such a path, but the narrative raises a number of questions about the nature of scientific enquiry in archaeology and palaeoanthropology.

One simple view is that all ideas have their time and then pass in the light of revised and better supported views, and we should not judge the approaches of the past by the standards of the present. But this does not really apply: at the time that Dart advanced many of his wilder views, in the interwar decades and immediately after, prehistoric sciences were already established and growing in strength. Dart's views and lines of argument were leading in quite opposite directions, which he developed and adhered to for over five decades

A harsher view is that if one throws out large numbers of improbable hypotheses at least one of them (in this case the evolutionary position of *Australopithecus*) may turn out to be confirmed. In this light it is fortunate that the claim was one of Dart's earliest publications in the field, but in fact it was not accepted outside South Africa for more than a decade by which time his other themes had already entered the literature. While the methodology and many of the conclusions in Dart's writing must be challenged, it is not

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[118] P.V. Tobias, "Homage to Emeritus Professor R.A. Dart on his 75th Birthday," *South African Journal of Science* 64 (1968), 42–50; P.V. Tobias, "Raymond Arthur Dart (1893–1988)," *Nature* 337 (1989), 211.

[119] Tobias, *Into the Past*, 24.

impossible that a second of his many adventurous hypotheses might in time be seen as an inspired guess matching a newly accepted argument.

Physical anthropology and archaeology are not for the most part *experimental* sciences. However for much of their scope they are *testable* by the expectation of replication, of recovering larger samples. The rarer the material, least replicable the samples, the easier it is to generate dramatic hypotheses which are not readily refutable, and which bypass the desideratum of a scientific hypothesis, that it should be structured so as to be readily nullifiable by scientific method. Even recently interpretations of population movements from (and at times into) the African continent have conveniently ignored geographical limitations and boundaries and the principle of Occam's Razor, to support complex explanatory models.[120]

We have referred to the distance drawn by Glyn Daniel between scientific archaeology and "the lunatic fringe" as if there is a clear line applicable at all times. This approach is reflected in a recent collection of essays edited by G. Garrett Fagan[121] on "pseudoarchaeology" in which Daniel's professorial successor Colin Renfrew takes a similarly unambivalent line. There are problems with such a simple approach.[122] Though largely accepting the divide of science from pseudoscience Garrett Fagan[123] does concede "pseudoarchaeology is not therefore restricted to maverick, unprofessional writers with very strange ideas about antiquity. It is a trap that can ensnare professionally trained academics when their egos, ideologies, or other personal beliefs get in the way of their commitment to open enquiry." He identifies pseudoarchaeology as characterized by a number of attitudes: "Dogged adherence to outdated theoretical models; disparaging academia; appeal to academic authority; huge claims; selective and/or distorted presentation; the kitchen-sink mode of argument [weight of selected data]; vague definitions; superficiality, sloppiness and grossness of comparison; obsession with esoteric; a farrago of failings; expectation of a reward at quest's end."

This seems too simplistic and pious a division between good and bad, science and pseudo-science, us and them. There are many examples in which the rational and the irrational coexist. We are frequently reminded how Isaac Newton was an enthusiast for astrology while laying the basis for scientific physics; that while Conan Doyle defined the epitomy of rationality and logic in his detective novels his greatest passion was for the spiritualist movement; and in seeing how many contemporary leaders of scientific research attest to an unwavering fundamental religious faith coexisting with their research methodology.

Dart was a distinguished (if at times eccentric) teacher. His descriptive anatomy appears robust, though not free from criticism, given the failure to secure publication of his

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[120] Derricourt, "Getting 'Out of Africa.'"

[121] G.G. Fagan, *Archaeological Fantasies: How Pseudoarchaeology Misrepresents the Past and Misleads the Public* (New York: Routledge, 2006).

[122] W. Stoczkowski, "Review of Fagan: Archaeological Fantasies," *Antiquity* 81 (2007), 472–73.

[123] Fagan, *Archaeological Fantasies*, 29.

descriptive work on the Taung child.[124] He could have maintained a career involving contributions restricted to formal anatomy. But he chose to dip into unfamiliar worlds of archaeology with his extreme hyper-diffusionist ideas and untestable hypotheses, and also to follow paths of interpretation in physical anthropology that stretched credibility. Without Taung, if these had been his major outputs, he might have developed a quite different reputation. If he had then at a later stage of his career made a claim that the undated Taung skull represented a new genus and family ancestral to man, he would have been greeted with even greater skepticism. As it was, this early claim was the one that gained local and eventually wider scientific acceptance and established a reputation, which allowed his other ideas to be proselytized.

In the division of scientific from non-scientific method, one may argue that the "discovery" of *Australopithecus* was not methodologically a scientific discovery but a fortunate stumbling on the truth. It is good to remember scholars for their lasting contribution to our knowledge, but we need to be aware that the process of creating that knowledge is not always clear, clean, and methodologically sound.

[124] Wheelhouse and Smithford, *Dart,* 176–77.

Notes on Contributors

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