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The acquisition of spatial and mountain literacy by children in Hergé's *Tintin in Tibet*

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Abstract

The presence of spatial and mountain literacy in Tintin in Tibet is related to broader geospatial reasoning which has import later in life. The literature review for this paper covers the theories of spatial literacy and ability, as well as the developing field of mountain literacy. Methodologically, the comic book was analysed in terms of spatial literacy and then mountain literacy, chiefly in terms of altitudinal band differences, risk and danger, through page progression and analysis. Key findings were that this particular comic book is full of references to spatial and mountain literacy theories. Young readers who take careful note of the comic book could gain a head start in geography, in particular to what pertains to mountains (climate, vegetation, risk, danger) in Europe and Asia, both lowland and highland, but also in terms of diverse urban and regional forms.

Introduction

Tintin in Tibet gives a young reader the opportunity to visualise the new world of the Asian Himalaya for the first time. Hergé starts developmentally, by introducing the European child to familiar scenes from European mountains, transposes the child to urban settlements in Asia, and finally to the strange, mysterious and hazardous world of the high Himalaya.

For me personally, reading all the Tintin comic books was an education in itself (noted also in Castro, 2021). As a child in the 1970s, I was unaware of some of the more controversial elements of the comic book at the time. Indeed, I was unable to read *Tintin in the Congo* because it wasn't available in our local public library in suburban Cape Town. As a geography lecturer, I began to wonder whether or not the knowledge and lessons of the Tintin books had been conveyed (or could be) to all South African learners, regardless of background.

This was prompted when I was explaining the influence of altitude on temperature, and gave an example of a frozen corpse on Mount Everest, during a climatology lecture. A student in that particular class asked if the corpse was 'rotting'. I wondered why and how the student seemingly had no idea of the

temperatures that exist on an +8000m peak (in summer temperatures on Mount Everest routinely reach -30°C and in winter -57°C), and then thought about how I had learnt about temperature and altitude as a child (it did help, of course, that I was interested in mountains from an early age). Of course, formal education in primary and high school had helped, but I recollected the importance of my informal education as a child. This informal education involved reading copiously as a child and later joining the Boy Scout movement. Regarding reading, it helped that my local library was about ten or fifteen minutes' walk (or about 1.5 km) from my home.

I now know, of course, that Tintin comic books were not equally available to all South African children. Public libraries are often far from where the vast majority of South African children reside and it can also be very expensive to access those libraries. Libraries also stock a limited number of books and may have only stocked Tintin books in English-speaking and middle class suburbs. Where South African children are concerned, the comic book was only published in English and indeed no African language, not even Swahili or Afrikaans, is listed under the languages that were used in the publication of Tintin books (Hergé,

1962). Of the 38 languages listed, only nine are non-European, and these are uniformly Asian. Afrikaans-speaking children could have accessed the Tintin books in English or less likely in Dutch.

Moreover, the book was written for a white European audience and the European culture is central throughout, although other cultures are included, some more sensitively than others. While this can be understood as a manifestation of the times, it is also important to realise that most South African children will not see representations of themselves in the pages. While the scope of this paper is not to ascertain the popularity or not of the book series in the present time, it is cogent to note, I think, that Tintin books have been read around the world and are still stocked in South African libraries (at least those in suburbs). Regarding the fact that the book series is decidedly gendered in tone and meaning, it must be borne in mind that the world of the 1950s was very different to what exists now, in terms of gender rights and awareness. It must be pointed out, however, that Hergé wrote other comic books (such as *The valley of the cobras* from the series *The adventures of Jo, Zette and Jacko*) where a female character (Zette) features in a full sense throughout the

book (Hergé, 1989). This article is necessary, besides the aforementioned point about temperatures on Mount Everest, as there is an increasing attention being placed on text book analysis (Hong, 2009; Jo and Bednarz, 2009), and how children acquire spatial and geographic reasoning from an early age. No geographical education analysis of Tintin comic books has been attempted before; academic articles have been invariably cultural and/ or political. The intention of this paper is not to critique Hergé and *Tintin in Tibet* against purposes such as accuracy for which the comic books were never intended. While it is true that the book series are surreal and fantastical in content, a strong argument can be made that the books also act as quasi- textbooks by introducing children to foreign and textured lands and places. One can learn a lot of human and physical geography from the series, and especially from a comic book such as *Tintin in Tibet*. I remember as a child wanting to find out more after reading Tintin books, such as finding more details about countries and places in atlases and encyclopaedias.

This article aims to determine the spatial and mountain literacy in one of Hergé's most famous comic books, namely *Tintin in Tibet*. The recent

(2022) tragedies in the Alps and the Dolomites (Marmolada) show the increasing influence of climate change-related risk in mountainous regions and accordingly, the need to adapt to increased exposure to risk and danger (for example, avoiding climbing under *seracs* and hanging glaciers).

Literature review

Tintin in Tibet was first published as a newspaper version in French in 1958 with the English translation appearing in 1962 (Thompson, 2011). As Douglas, author of *Himalaya, A Human History* (2020), explained, “The new story appeared under the title *Tintin in Tibet*, which had tested well with the publisher’s sales force, but it takes place as much in Nepal as Tibet and features drawing of Kathmandu’s temples that are both charming and accurate. The story features a yeti, the mythical abominable snowman, then at the height of its fame...” (Douglas, 2020, p. 471). The Tintin comic books are written from an overwhelmingly Western (in fact Western European) perspective. Europe is the exemplar of ‘normality’ and centrality, while the destinations Tintin travels to are the other, decidedly ‘not normal’ and on the periphery of the world. Chakraborty (2016) described the comic books

thus: “Tintin as a ‘subject’ works by imbibing the colonial/White energy, journeying from the center (Europe) to the margins (non-European places). Behind the visual scope of engaging the children with ‘fantasy’ within a mode of popular culture is Hergé’s political standpoint of seeing the Other from a colonial standpoint, which can be critiqued, problematized, and interrogated through a postcolonial debate” (p. 20). In Dunnett’s study on identity and geopolitics in the Tintin comics, he posited that “three forms of geopolitical meaning are identified within the Tintin comics: discourses of colonialism, European pre-eminence and anti-Americanism. These overlapping trends amount to different facets of one single discourse, which places European ideologies at the centre of its world-view” (2009, p. 583). From a religious standpoint, Tintin and Haddock’s religion is centred on the core (Europe) and a Westernised ‘normality’ while Eastern religions are seen as strange and even bizarre in places: “Monks are depicted to possess mystical abilities, such as levitation, while Blessed Lightning’s vision is also revealed to be true in the conclusion of the tale... Hergé makes use of Captain Haddock as a Western sceptic in *Tintin in Tibet*, who describes the levitation and visions of

Blessed Lightning as ‘hocuspocus’, to which Grand Abbot of the monastery responds that ‘many things occur here in Tibet which seem unbelievable to you men of the West’ ...” (Thomas, 2019, p. 7).

There is an issue to consider linked to geospatial reasoning in South African schools – this ties in with the observation regarding human-made and natural feature mis-identification on orthophoto maps as noted in the Department of Basic Education Diagnostic Report (South Africa. DBE, 2015). Spatial concepts are viewed as “systems of meanings within the mental organisation of the individual. They arise as he/she generalises from his/her experience, and serve as expectancies or hypotheses for the classification of incoming information” (Almy, 1967, in Ballantyne, 1980, p. 5). As educators we need to know the appropriate spatial concepts for the ages of the learners we teach. This helps us develop age-appropriate material. It is important to be aware of how spatial cognition changes and develops as the learner gets older. According to Werner, “developmental psychology postulates one regulative principle of development; it is the orthogenetic principle which states that wherever development occurs it proceeds from a state of relative

globality and lack of differentiation to states of increasing differentiation, articulation and hierarchic integration” (1972, in Ballantyne, 1980, p. 8). Werner maintained that children are born with little or no spatial concept. Children grow up disbelieving in fairies and Father Christmas because “the gradual organisation of spatial concepts limits, in a sense, the way in which an individual child perceives the environment around itself” (Ballantyne, 1980, p. 8). This has import for how children come to terms with mountain myths such as those surrounding the Yeti and BigFoot.

Children usually read Tintin between the ages of 8 and 13. According to Llull (2014), Tintin comic books are better suited to primary school. Younger children will not understand everything that Hergé was trying to convey but are likely to be animated by a sense of mystery and unreality (especially the Yeti). In terms of Piaget’s (1972) developmental phases, for the purposes of this article, the relevant phase is concrete operational space (middle childhood). Golledge and Stimson (1997, p. 227) showed how, in a developmental context, Piaget and Inhelder (1967) “identified the third and fourth stages of perceiving: a third stage involves *recognizing the relevant parts* of the

perceptual objects and being able to *specify* these components.... (and) a fourth stage is one of *identification*, or more realistically, the *attachment of meaning* to the *stimulus object*....” This has particular relevance to the comic book, as these are the two stages most appropriate to the reading ages (recognising the objects and attaching meaning).

Blaut and Stea (1971, p. 226) concluded that “place learning occurs quite generally without formal schooling” (in Ballantyne, 1980, p. 34). Place learning is a fundamental part of children’s development. All children, to interact well with their environment, need a cognitive map which “enables the child to predict the environment which is too large to be perceived at once, and to establish a matrix of environmental experience into which a new experience can be integrated” (Blaut and Stea, 1971, in Ballantyne, 1980, p. 34). An integral part of place learning is learning about sense of place. Norberg-Schulz (1980) has listed the types of spirit or genius of place (sense of place) as Romantic, Cosmic, Classical and Complex. It is clear that views of mountains from afar can count as Romantic while being in snow-covered mountains is akin to a Cosmic experience. Classical most often refers to the order and structure of

European urban forms while complex can most appropriately relate to non-classical and layered/ diverse urban forms and experiences. Golledge and Stimson (1997, p. 396) have described six ways in which landscapes ‘hold’ information. The authors noted how landscapes surround, that landscapes are multimodal, that landscapes involve both central and peripheral information, and that landscapes access information as well elicit action from the observer, and lastly landscapes always have ambiance. This variety in ways of seeing landscapes, both European and South Asian, urban and wilderness, corresponds with ways of considering landscapes in *Tintin in Tibet*. Golledge (1992, pp. 5-6) outlined the “components of spatial knowledge” as the “a) location of occurrences, with each occurrence having a minimal descriptor set including identity, magnitude, location and time; b) spatial distributions of phenomena: each distribution has a pattern or shape; c) regions or bounded areas of space in which either single or multiple features occur with specified frequency; d) hierarchies or multiple levels or nested levels of phenomena; e) networks or linked features having characteristics, connectivity; f) spatial associations including spatial autocorrelation,

distance decay, and contiguities; g) surfaces or generalizations of discrete phenomena, including densities of occurrence.”

Having considered the general theory and knowledge of spatial understanding, it is now appropriate to explore the theory of spatial ability. Golledge and Stimson (1997, pp. 156-157) noted that “spatial ability includes the following:

1. The ability to think geometrically.
2. The ability to image complex spatial relations such as three-dimensional molecular structures or complex helices.
3. The ability to recognize spatial patterns of phenomena at a variety of different scales.
4. The ability to perceive three-dimensional structures in two dimensions and the related ability to expand two-dimensional representations into three-dimensional structures.
5. The ability to interpret macrospatial relations such as star patterns or world distributions of climates or vegetation and soils.
6. The ability to give and comprehend directional and distance estimates as required in navigation and path integration activities used in wayfinding.
7. The ability to understand network structures.
8. The ability to perform transformations of space and time.
9. The ability to uncover spatial associations within and between regions or cultures.
10. The ability to image spatial arrangements from verbal reports or writing.
11. The ability to imagine and organize spatial material hierarchically.
12. The ability to orient oneself with respect to local, relational, or global frames of reference.
13. The ability to perform rotation or other transformational tasks.
14. The ability to recreate accurately a representation of scenes viewed from different perspectives or points of view.
15. The ability to compose, overlay, or decompose distributions, patterns, and arrangements of phenomena at different scales, densities, and dispersions.”

Mountain literacy, a subset of spatial literacy

Very little has been written on

mountain literacy and even less on mountain literacy and educational attainment. A brief perusal of mountain literacy articles in Google Scholar shows that other mostly cultural and economic issues predominate in mountain literacy discourse. My first exposure to the tenets of mountain literacy was in a course in 1982 where I learnt about expedition planning, equipment, foods, mountain hazards, route finding, leader's responsibilities, campcraft, weather, accident procedures and walking skills (Boy Scouts of South Africa, 1982). As one can see, knowledge and competence in every one of these categories aids immensely in developing one's skill set for anything to do with mountains, and generates a sense of personal mountain literacy. Cleare (1980, pp. 6-7) has written about the lure and mythology of mountains: "not everywhere were the mountains so benevolent. The alpine peasant of medieval Europe could have derived little spiritual satisfaction from the mountains that encircled his horizon and which he knew by such names as Eiger (Ogre), Mount Maudit (Accursed Mountain) or Teufelsberg (Devil's Mountain). Even enlightened scholars knew that they were infested with dragons and demons, with trolls and hobgoblins." Of course, mountaineering contains

an element of risk and danger always. Exposure to risk and danger, and the resulting knowledge and conditioning allows people to ascertain mountain hazards, and how best to avoid or ameliorate the risk. In addition, this exposure and knowledge can aid in other ways such as ascertaining the risk of building structures on slopes, and the likely consequences of weather on a particular area. "Mountaineering has been defined as 'the crossing of potentially dangerous mountain or other steep terrain in safety.' Danger and safety are key words: the former because it is the *raison d'être* – but never the substance – of the game, the second because it is mountaineering's only justification" (Cleare, 1980, p. 8). Cleare (1980) went on to describe the characteristics of mountaineering: "fear ... perfect control ... conscious and personal choices ... danger, and the challenge ... experience and ability ... anarchistic sport ... responsibility for one's actions are entirely one's own ... mistakes can earn the ultimate penalty ... physical exultation ... beautiful ... partners of the rope and there was deep trust between us" (p. 9). All these elements contribute to a personalised mountain literacy in the participant. Where *Tintin in Tibet* is concerned, the exposure to the high Himalaya contains another risk, namely the

risk of altitude sickness: “The single most important consideration is the effect of high altitude on the climber himself ... the worst effects of the oxygen depleted atmosphere at high altitude ... are shortness of breath ... and altitude sickness in its various forms” (Cleare, 1980, p. 137). There are also other factors, including human, that Cleare outlined such as labour disputes on Himalayan expeditions: “Alternatively porters may be troublesome and entirely destroy an expedition with strikes, theft and restrictive practices” (1980, p. 134). While Cleare (1980) was writing before a modern awareness of porter exploitation by Western recreationists and climbers, it is important to view this quotation in context, as labour difficulties also manifest themselves in *Tintin in Tibet*. The author also explained some mountaineering and mountain characteristics that feature in the comic book such as a belay (p. 155), cornice (p. 155), sherpa (p. 159) and traverse (p. 160).

With reference to the European mountains where the Tintin story begins, Unsworth (1977) has described the Western Alps in France, which have similarities to the comic frames referring to Tintin’s hikes in the mountains. Furthermore, ‘Vargèse’ in Tintin looks uncannily

like Chamonix in the Mont Blanc group of mountains. In contrast, Unsworth (p. 177) described some definitions and features, including the relevant altitudinal bands, of the range in Asia the comic book is partly set in: “The Himalaya is some 1,500 miles long ... for most of its length it can be divided into three parts: the Siwalak range ... forested and never more than 3,000 ft high; the complex and wide middle range known as the Lesser Himalaya whose average height is 15, 000 ft, limestone, and wooded on the lower slopes ... and finally the Great Himalaya, composed mostly of granites and gneisses, and seldom less than 18,000 ft in height.” The Himalaya on the Nepalese side differs from that on the Tibetan side, as Unsworth explained: “Tibet itself is an immense high plateau from which mountain ranges arise in some confusion” (p. 89).

Methodology

A comprehensive ethics application was submitted to the University of KwaZulu-Natal’s research office and the result was exemption from ethics review (Application number: 00017116). My aim was to do a critical reading of the text to answer the following research questions:

1. What are the spatial and

mountain literacies evident in *Tintin in Tibet*?

2. How does the comic book act as an unofficial or quasi-geography textbook by answering research question 1?

The aims of my research were:

1. To broaden my knowledge on the spatial and mountain literacies evident in *Tintin in Tibet*,
2. To find out how the comic book acts as an unofficial or quasi-geography textbook by answering research questions 1 and 2.

The objectives were to have a paper published on this topic and to disseminate my improved knowledge of spatial and mountain literacy to the broader academic community.

The methodological device I chose was to do a page progression analysis of the comic book following this format: place (including country, region, town and altitudinal band); urban form; culture, including attire and equipment; danger and risk; speed of movement; mythology; spatial and mountain literacy skills formation, and imagery.

Page reference is essential for page progression analysis while place location (including country, region,

town and altitudinal band) is essential for spatial and mountain literacy analysis. Altitudinal bands indicate the influence of climate on vegetation. This research also considered the settlement or urban geography and biogeography/ meteorology evident in the comic book. Associated with urban form is culture, which is evidenced by behaviour, sayings and even attire. Attire and equipment indicate temperature and risk, for example the need to have ice axes and crampons. Danger and risk feature most strongly in the pages dedicated to accessing the Himalaya and especially the plane crash site. Mythology is dedicated to the sighting and experience of the Yeti. Speed of movement relates to the passage of the climbers through varying terrain and the time it takes them to complete the passage. Passing through deep and also hardened snow is an extremely laborious process. Spatial and mountain literacy skills formation were evident where Tintin was faced with a space or mountain situation and adapted accordingly. While imagery has been covered to some extent in the categories above, it is apposite to elaborate upon it, as imagery is integral to comics.

Analysis

The content analysis, as explained in the methodology above, takes the form of a table (see Table 1 below).

Page reference in <i>Tintin in Tibet</i> (Hergé, 1962)	Place (including country, region, town and altitudinal band). Norberg-Schulz (1980) classifications in bold.	Urban form	Culture, including attire and equipment	Danger and risk	Speed of movement	Mythology	Spatial and mountain literacy skills formation (from Golledge and Stimson, 1997, pp. 156-157)	Imagery
1-6	Vargèse (fictional town in French Alps) – scree and isolated trees above valley floor (subalpine band) and forested on valley floor. Classical	Continental European town style, especially the square, hotel and arcades	1950s continental European (see breeches or knickerbockers, jerseys)	References to aircraft crashes in mountains, and mountain dramas and alpine disasters	Hiking on p. 1, sedentary pp. 1-6 and aircraft flight on p. 6.		On p. 2, Tintin reading news report: “They wouldn’t stand a chance of surviving up there” [Ability 10]. On p. 4, “the plane that hit...surely that was going to Kathmandu” [Ability 9]	Imagery accords to the settings; namely outdoor, hotel veranda, dinner indoors, and hotel veranda. Individual, pair and group portraits.
6-9	New Delhi, India. Complex	Airport and city (Indian). See the Qutab Minar and Red Fort	Indian (traditional dress), sanctity of cows (religion), turbans, speech (colonial style of address)		Walking, being driven in a car, and even mounted on a cow (pp. 7-9). Aircraft flight (take off) on p. 9.			Airport scene, caricature of Delhi; portraits of individuals (including officialdom), pair, groups, animal and motor car.
10-15	Kathmandu, Nepal. Complex.	Nepalese architecture-eaves over buildings			Aircraft light (approach and landing) on p. 10. Walking in city.		On p. 10, airport manager says “...died from hunger and cold and exposure” [Ability 14]	Views of airport, officialdom, porters, vegetables drying on street, single portrait of guide (p.13) to accentuate response, hotel room.
15-17	Nepal lowlands- cultivate fields, single house, forested, terraces. Romantic.		Europeans and Nepalese guide wear hiking attire (Tintin and Haddock jerseys, guide just a shirt), porters barefoot and scanty clothing. From p. 17 ice axes are used for walking		Hiking			Contrast in imagery of posture and gait between that of porters, and guide and visitors. Scenes of path and camping.

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17-22	Nepal, youthful river stages, diverse terrain – scree first and then rocky, vegetation isolated shrubs (subalpine-c. +3000masl), descent to a subalpine forest, ascent again to rhodendrons (subalpine). Complex.		Nepalese <i>chortens</i> (beacons) on top of a pass	Log bridge. Intimation of feeling the height (p. 19)	Hiking	Need to pass on the left side of a chorten	On p. 20, chortens on pass shoulders [Abilities 3 and 12], on p. 22, alpine forest recognised [Abilities 9 and 5], and Tharkey (guide) says; “Across there, Tibet!” [Ability 6]	Imagery of potential danger- river and verticality of slope. Scenes of cultural artefacts and mountains plus forest.
22-43	Nepal, ascent to snow line (alpine and Himalayan, +c. 5500masl), first reference to Tibet across the watershed, snow thick from p. 25, snow transformation of landscape; on pp. 29-30, Tintin correctly guesses that a cave is nearby Cosmic.		Porter wear fez type hats and waistcoats, Europeans wearing jerseys, from p. 24 jackets or cagoules and from p. 25 snow goggles, porters improbably barefoot and snow goggle-less in snow, guide opting out on p. 37	Echoes (audibility) and avalanche risk and occurrence, aircraft crash site on p. 28, sudden change in weather and blizzard (p. 30), fall into crevasse (p. 31), stove danger and thin air on p. 37, St. Elmo’s fire on p. 39, friable rock and Tintin not attached to stance on p. 39, suspension on rock on pp. 39-41: intention to cut the rope – fingers numb, storm on p. 41 – tent blown away, indication of cornices on p. 43 and subsequent break of snow surface	Ascending in snow from p. 25. Alpine traversing from p.28, heavily laden from p. 27, slowness in blizzard, rescue team roped up on glacier, slowness and belay exactitude of crevasse rescue, pp.32-33, climbing sheer rock face, pp. 38-41: belay and rope	First reference to power and danger of Yeti, prohibition on alcohol, print marks of yeti on p. 15, dog reacting, porter rebellion due to Yeti (p. 27), Yeti apparition on p. 31, re-appearance and noises of Yeti in flying tent on p. 42	On pp. 29-30, Tintin finds a cave by geographic intuition [Ability 12], on p. 34, “...snow last night has completely altered the landscape” [Ability 1], on p. 41, the guide Tharkey says: “pitch camp quick behind rocks; storm comes!” [Ability 8], and “A monastery!...We’re saved!” on p. 43, so different to Nepal, in Tibet [Abilities 3 and 8]	Imagery of caricatures of guide and porters, regarding superstition. Individual portrait of Tharkey, the guide, on p. 23 to emphasise his response. Scenes of world of white in Himalayan wilderness, and of danger (crash site, storm, crevasses and cliff face). Close up of Tintin on p.35 to show his concern of the fate of his friend.

Page reference in <i>Tintin in Tibet</i> (Hergé, 1962)	Place (including country, region, town and altitudinal band). Norberg-Schulz (1980) classifications in bold.	Urban form	Culture, including attire and equipment	Danger and risk	Speed of movement	Mythology	Spatial and mountain literacy skills formation (from Golledge and Stimson, 1997, pp. 156-157)	Imagery
43-52	Tibet, across the watershed and sight of Tibetan monastery on p. 43, snow traversing. Tibet, sudden descent to rocky subalpine zone, subalpine meadows on p. 53. Cosmic and complex	None except for monastery form	Tibetan monk robes and sticks, head monk hat attire. Broken English speech of guide on p.43 (Look out! We not stop here!),	Fall due to cornice breaking	Rapid fall in subsequent avalanche	Induced levitation of Tibetan monks on p. 44. Buddhist goddess statues, kites, Tibetan name for Yeti: <i>Migou</i>		Long range view of monastery, imagery of fear on face of guide on p. 43. Accentuated view of avalanche, imagery of monotone (and later multitone and hooded) monks, yak and monastery.
52-60	Tibet, ascent to just below the snowline. Romantic		Tintin and Haddock don jackets the higher they ascend. Ice axes for walking aids.		Three-day hike to Chasahbang and then four-day hike later (on p. 54)	Sacred mountain on p. 54, re-appearance of Yeti on pp. 55-58, anthropogenic character of Yeti	On p. 54, "our next objective is a mountain that looks like a yak's horn" and in the next frame "it's unmistakable: that mountain there. Look at the shape!" [Abilities 3 and 14]	Imagery of group of barefoot and robed children, saddled horses, hiking scenes in the subalpine. Imagery of cave scene, yeti signifying danger and mystery, flashback to aircraft crash. Anthropomorphic imagery of yeti caring for human child.
60-62	Tibet, descent to rocky subalpine zone, plateau desert journey, and reference to returning to Europe. Cosmic		Tibetan monk robes		Few days hiking and descent to village, three days hiking to monks at monastery, horse-borne travel (p. 62) after a week resting at monastery		On p. 62, "And thanks to those kind monks who organised this caravan for us, we'll soon be back in Nepal – and then on our way to Europe" [Abilities 8, 9 and 12]	Views of generally multitone and hooded monks, musical instrument (horn), and caravan of horse-borne transport. Final image to accentuate presence and character of yeti.

Table 1: Place, urban form, culture, danger and risk, speed of movement, mythology, spatial/ mountain literacy skills formation, and imagery in Tintin in Tibet

Discussion

To answer the first research question (what are the spatial and mountain literacies evident in the comic book?), it makes sense to consider the following characteristics. In terms of locations, children are first introduced to genteel urban scenes from the Alps which propose images of normality and convention. Vargèse could easily be Chamonix in the Savoy region and Tintin's hike pictured on page 1 could be the *Balcon du Nord* above the town (Unsworth, 1977). The location is suddenly shifted to South Asia, with Tintin and Captain Haddock landing at Delhi airport. Scenes and disorder of Delhi (not the British-designed New Delhi) are shown. Tintin and entourage are then transported to another South Asian city, namely Kathmandu. Once essential arrangements have been made for the rescue of Tintin's friend, the scene then shifts to the foothills (the lowlands) of the Himalaya, then the subalpine zone and tundra, and finally the alpine zone of that massive range. The comic book ends with Tintin and entourage descending into Tibet and finally being transported across the high Tibetan desert plateau to a nearby airport for travel to Europe. The centrality and normality (see Chakraborty, 2016 and Dunnett,

2009) of Europe is evidenced by Tintin saying to Chang, his Chinese friend whose true home is China, "and then on the way to Europe" implying this is his real home.

Regarding altitudinal zones, these act as steps or stages up mountains. The comic book most likely takes place in the eastern Himalaya. The first altitudinal zone is between 1500 and 3000m, with eastern Himalayan broadleaf forests (these can be seen on p. 15). Above 3000m and under 4000m, there are eastern Himalayan subalpine conifer forests (on p. 22, Tintin likens the forest to an alpine one and in the next frame Haddock refers to rhododendron plants). Above 4000m and till 5500m the tundra or subalpine zone commences, with eastern Himalayan alpine shrub (junipers and rhododendrons) and grassland meadows predominating. The last zone, which is above 5500m and which ends at 8848m in the Himalaya, is the alpine or permanent snow and ice zone (Encyclopedia Britannica, n.d.; Unsworth, 1977). The high plateau desert (around 5500m) where the story ends on the Tibetan side of the range is the leeward side of mountains, where very little rainfall occurs (Unsworth, 1977). The altitudinal zones are evident in the different clothing the climbers wear, with jackets and woolly hats

reserved for the very highest altitudes.

Pages	15-17	17-21	22	22-43	43-52	52-61	62
Approximate zone	Lowlands c. 1500-3000m	Subalpine c.+3000m	Descent to forest c. 2000m	Ascent to alpine zone c.+5500m-6500m	Sudden descent to monastery c. 5000m. Subalpine zone	Traverse to Charahbang and ascent to just below snow line and alpine zone c. 5500m. Return to Charahbang and walk back to monastery at c. 5000m	Tibetan plateau c. 4500m
Days spent	One day	One day	One day	Seven days	Four days	20 days	One day

Table 2 : Days and altitude trajectory in *Tintin in Tibet*

in terms the urban settings in the comic book, the three predominant urban forms are the western European continental town style or more specifically, Western Alpine town style (classical), followed by the Indian city, characterised by Mughal architecture, and the characteristic Nepalese architecture style (complex) (Norberg-Schulz, 1980). Children are also exposed to the other two forms of sense of place, cosmic and romantic (ibid.), which could aid their understanding of multifaceted landscapes (Golledge and Stimson, 1997).

In terms of culture, as this also informs spatial literacy and sense of place, the comic book sweeps from

late 1950s continental European culture (especially the growth of mass tourism in the mountains and along the coast of France) and the attire (breeches or knickerbockers) worn by hikers in that era (Thompson, 2011). Indian traditional dress is evident next and the protection afforded against beasts. Once in Nepal, Europeans and Nepalese guides wear Western hiking attire whereas the porters are very scantily dressed with no footwear. When Nepalese chortens are spotted at the top of a pass, and once above the snowline, the guide and customers wear the full paraphernalia of Western mountaineering equipment, including snow goggles. However, the porters

do not wear any protective equipment and here Hergé is surely mistaken, for snow blindness and frostbite would surely affect any porter, no matter how hardy, not properly equipped. Difficult guide-customer labour relations are shown when the Nepalese guide elects to turn home once the plane wreckage has been found (Cleare, 1980). The last part of the comic book depicts the culture and attire of Tibetan monks, and the defining features of different ranks of the monks.

Where danger and risk pertain to mountain literacy, the comic book starts off with Haddock fulminating about the risk and danger of mountains, and then pointing out a news article about an aircraft crash in the Himalaya. Thompson (2011) has written about a mountain risk that occurs in the comic book, namely that of aircraft crashes in mountain terrain. He noted that the aircraft logo was changed from Indian Airways to Sari-Airways, although in the comic book, the aircraft still shows the Indian Airways logo (and it is mentioned in the text on page 2 [Hergé, 1962]). This sensitivity was due to the famous Indian Airways crash on Mont Blanc in the French Alps in 1950, of which Hergé would surely have been aware (Thompson, 2011). Of course, the aircraft crash in the comic book is eerily reminiscent

of another famous aircraft crash in mountain terrain, namely the famous crash in the South American Andes in 1972, which was later made into a film, titled *Alive* (Read, 1974). In the lowlands, reference is made to the hazards of crossing rivers using log bridges, while above the snowline the danger and risk of avalanches, highly changeable and violent weather and blizzards, crevasses (both falling in and the safe extracting from), St. Elmo's fire, collapsing cornices (where the consequences are invariably fatal) and even exploding stoves (due to thin air) are evident in the text and illustrations (Hergé, 1960). As mentioned before, danger is a feature of all mountain ranges but in glaciated terrain, it is pronounced. Falling into a crevasse is a risk for anyone crossing a glacier. In the rock climbing pages on pages 39-41, references are made to rock friability and the likely consequences of not belaying correctly and/ or not having the correct experience to climb safely (Hergé, 1962). The comic book also shows the speed of movement of the participants which is affected by the terrain and danger. This varies from relaxed hiking in the lowlands to much more difficult mountaineering above the snowline, especially when the porters mutiny and leave, with the consequent heavy loads to be

carried. Extremely slow and laborious movement is shown with Tintin trying to navigate through a blizzard, being belay rescued from a crevasse, and climbing a sheer rockface (Hergé, 1962). The necessity of sometimes having to cut the rope to save at least one is a nightmare scenario for climbers (Thompson, 2011). This is also eerily reflected in the book by Joe Simpson and associated film *Touching the Void* (Simpson, 1988). Rapid and impossible to survive movement is shown with the participants being avalanched down a mountainside and more relaxed hiking and horse-borne transport is evident towards the end of the comic book.

Another influence on spatial form is mythology. This includes superstition, which can be linked, admittedly, to stereotyping (Chakraborty, 2016; Thomas, 2019), reference is first made to the need to pass chortens on the left side only, while once the snowline is reached, the danger of Yetis is exclaimed by the porters, with an insistence of no alcohol intake (Hergé, 1962). Regarding Yeti mythology, Cleare (1980, p. 63) showed an illustration of a purported Yeti scalp (whose angles look very much like the Yeti in the comic book) in the Pangboche Gompa (monastery).

Thompson (2011) also wrote about Yeti mythology and mentioned that Hergé interviewed mountaineers who claimed to have some knowledge of the mythical creature. The Himalaya and even the mythical Yeti were all over French newspapers in the 1950s with Annapurna 1, the first '8000'er', having been climbed by a French team in 1950 (Unsworth, 1977). A little later, the porters decide to pull out of the expedition altogether due to the danger (see Cleare, 1980), and more sightings of the mysterious and ominous Yeti are made. Once in Tibet, we see monks levitating and Buddhist representations in the form of statues and kites (Hergé, 1962). It is important to link Hergé's observations to what Thomas (2019) has written on representations of Western 'normality' versus what occurs or appears to occur in the East. On page 54, a mountain that looks very much like the sacred and still unclimbed Machapuchare (Cleare, 1980) is shown, and the comic book ends off with a reappearance of the Yeti and its surprisingly anthropocentric behaviour explained by Tintin's friend (Hergé, 1960).

The imagery presented by Hergé complements and perfects the writing accurately. It is impossible to read Tintin without intertextuality, i.e.

reading the writing and visualising the imagery simultaneously. The scenes cover a multitude of contexts; from place (from the horizontal to the vertical and city to rural), people (including human movement, officialdom, labour, dress and reactions), animals, transportation, and nature and wilderness. Single individual frames are used to accentuate response. The reactions and behaviour of individuals, pairs and groups are captured accurately.

Where spatial literacy knowledge is concerned, Golledge's (1992) components of spatial knowledge feature prominently, where "location of occurrences, spatial distributions of phenomena, regions ... of space, ... multiple levels ... of phenomena, networks ... of connectivity, spatial associations, and surfaces ... of phenomena" all play a role, as seen above, in the comic book.

With respect to the second research question (How does the comic book act as an unofficial or quasi-geography textbook by answering research question 1?), certainly the representation of spatial abilities (Golledge and Stimson's (1997, pp. 156-157) plays a major role in answering this question. The spatial literacy abilities in the mountain pages of the

comic book are in effect mountain literacy abilities, and these are acquired too. When on page 2, Tintin reads a news report and explains: "They wouldn't stand a chance of surviving up there", this shows the ability (10) to image spatial arrangements from verbal reports or writing. Regarding mountain literacy, this quote shows the non-existent chance of surviving in such an inhospitable environment. This ability is also evidenced on page 4 where Tintin reasons from Chang's letter and his proposed route that "the plane that hit ... surely that was going to Kathmandu". However, this is also the ability (9) to uncover spatial associations (the air route between Patna and Kathmandu) within and between regions or cultures. The ability (14) to recreate accurately a representation of scenes viewed from different perspectives or points of view is shown on page 10, where the airport manager says with respect to the plane crash victims that they would all have "died from hunger and cold and exposure". The ability to survive a plane crash in a freezing and barren landscape would have been impossible, as noted above. On page 20, chortens are noted on pass shoulders. This shows the ability (3) to recognise spatial patterns of

phenomena at a variety of different scales, where noteworthy landmarks are situated on the top of passes, and also the ability (12) to orient oneself with respect to local, relational, or global frames of reference. Local and relational frames of reference also relate to how mountains are ordered, or made sense of. The ability (9) to uncover spatial associations within and between regions or cultures, and the ability (5) to interpret macro-spatial relations such as star patterns or world distributions of climates or vegetation and soils, are demonstrated on page 22, where Tintin recognises Alpine-like forest. This relates to altitudinal bands which have been discussed above. Later on the same page, Tharkey (the guide) says, "Across there, Tibet!" which is the ability (6) to give and comprehend directional and distance estimates as required in navigation and path integration activities used in wayfinding. In this case, Tibet is across the Himalayan watershed between Nepal and Tibet (mountain literacy).

On pages 29-30, Tintin finds a cave, after thinking to himself that Chang would have headed to any place, in this case a rock face, with the likelihood of shelter, which is key in mountain literacy. This is the ability

(12) to orient oneself with respect to local, relational, or global frames of reference. Emerging from the cave, Tintin finds himself in a blizzard that has come from nowhere, and falls into a crevasse, which is a feature of glaciers. Tharkey and Haddock move across the glacier roped and equipped with ice axes, which are essential for survival, and then perform a crevasse rescue (mountain literacy). On looking for the cave again, on page 34, Tintin exclaims that the "snow last night has completely altered the landscape", but is nevertheless able to find his way. This is the ability (12) once more to orient oneself with respect to local, relational, or global frames of reference. Another ability (8), to perform transformations of space and time, is evidenced on page 41, where Tharkey exclaims "pitch camp quick behind rocks; storm comes!" Here, Tharkey correctly works out the wind and storm direction and the urgency to find shelter behind rocks. On page 43, Tintin exclaims "A monastery! ... We're saved!" which is evidence of the ability (3) to recognise spatial patterns of phenomena (a Tibetan monastery, so different to Nepalese structures) at a variety of different scales. It also recognises the ability (8) to perform transformations of space and time,

in that Tintin correctly surmises that they will reach the monastery safely in space (distance) and time (before they are exhausted).

The ability (3) to recognise spatial patterns of phenomena at a variety of different scales, and the ability (14) to recreate accurately a representation of scenes viewed from different perspectives or points of view, are shown on p. 54 where Tintin states “our next objective is a mountain that looks like a yak’s horn” and in the very next frame “it’s unmistakable: that mountain there. Look at the shape!” Here, Tintin correctly recognises the mountain ahead of him, and no other, as the one that looks like a yak’s horn. On page 62, Tintin says, “And thanks to those kind monks who organised this caravan for us, we’ll soon be back in Nepal- and then on our way to Europe”. This is the ability (8) to perform transformations of space and time, in that Tintin is visualising the route and timeframes ahead of the party. It also demonstrates the ability (9) to uncover spatial associations within and between regions or cultures, in that he correctly positions Nepal, and its international airport, next to Tibet and over the watershed which is the international border. Moreover, it is the ability (12) to orient oneself with respect to local, relational, or global

frames of reference (Golledge and Stimson, 1997, pp. 156-157).

It has been shown that spatial abilities are represented 18 times, with the ability (12) to orient oneself with respect to local, relational, or global frames of reference appearing four times. The ability (3) to recognise spatial patterns of phenomena at a variety of different scales, the ability (9) to uncover spatial associations within and between regions or cultures, and the ability (8) to perform transformations of space and time appear three times. Thus, it is clear that abilities or skills relating to uncovering and orienting oneself to locational dynamics feature most strongly, along with understanding space, primarily distance, and time. The ability (14) to recreate accurately a representation of scenes viewed from different perspectives or points of view features twice, while abilities 5 (interpreting macro-spatial relations), 6 (direction and distance estimates) and 10 (imaging spatial relations from verbal or written reports) feature only once. However, it can be safely said that all spatial literacy abilities complement each other, leading to a highly readable representation of spatially and indeed mountain literate occurrences in the comic book (Golledge and Stimson, 1997, pp. 156-157). Like all good

geography textbooks, *Tintin in Tibet* covers a good mix of the human and physical geographies (the physical informs the human), centred on two regional foci, namely the Western Alps of Europe and the Himalaya. Children learn through diverse prisms or lens, such as place, urban form, culture, danger and risk in mountains (chiefly meteorological and cryospheric), and mythology (Castro, 2014). The most important is, however, place, which covers countries (some in separate continents), regions, towns and altitudinal bands. Llull (2014) noted that Tintin comic books have been used very successfully in the instruction of social sciences (history and geography) to pre-service teachers at a Spanish university. He went on to note that “single vignettes are used to identify landscapes, climates, landform, biodiversity and human settlements, as well as to infer the characteristics of certain ecosystems, such as deserts, jungles, savannahs, and high mountains” (ibid., p. 57).

Conclusion

Not only was Hergé a creative and comic genius but he was also a geography educator of note. *Tintin in Tibet* covers both physical and human geography – from urban

forms, transport to climatology and biogeography. In this, it acts as a superb quasi-textbook for primary school children. Mountain hazards are especially well covered. The spatial and mountain literacy represented and evidenced in the comic book are a very good introduction for pre-adolescent children and help to uncover valuable and life-enduring lessons about urban and regional form, mountain features, risks and dynamics, and the relationship between space and time.

Author Bios

Born and raised in Cape Town, South Africa, Dr Gavin Heath graduated from the University of Cape Town with a Bachelor of Arts (majors in Environmental and Geographical Science, and English) in 1989, a Higher Diploma in Education (Post-graduate) for Secondary Education (English and Geography methods) in 1990, and a Master of City and Regional Planning in 2000. Dr Heath taught English and Geography at schools in the eastern and western Cape, South Africa, and the United Kingdom, up to 1998, and then left secondary school teaching to complete his full-time Master's degree. Dr Heath started lecturing at the former University of Natal in 2002; in 2021 Dr Heath was awarded his Doctorate of Philosophy (in Education)

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Competing interests

The author reports there are no competing interests to declare.

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