



SHUTTERSTOCK/GRZEJAN

Take a hike

Simply going for a stroll brings an astounding, and growing, list of health benefits. So, what are the ingredients for a perfect walk, wonders **Helen Thomson**



The volatile chemicals produced by pine trees have numerous health benefits. They may even help fight cancer

THE view is spectacular as I hike the steep, stony path up Yr Wyddfa, or Snowdon. I stop to breathe in the crisp mountain air with its faint tinge of honeyed heather and to appreciate the silence. Making my way again, all I can hear is the rhythmic tramping of boots against rock. But then, the distinctive beat of Ace of Base's "All That She Wants" encroaches on my awareness. It is getting louder, and the source soon becomes apparent as another hiker strides past me, a stream of 90s bangers emitting from his backpack.

Each to their own. We are all attempting to get to the top of Wales's highest peak, but in our different ways. Some are marching up the shortest route; others are taking their time, enjoying the smells and sounds; and some are carrying their entertainment with them. We will all benefit from the hike: walking improves

heart health and muscle strength – and simply being in nature can boost mental well-being. Nevertheless, some of us may be getting more from our ascent than others.

Although any walking is good for you, it is becoming clear that the route you choose can exponentially enhance the health benefits. Specific landscapes, sounds and smells – even certain ways of walking – can turn a good walk into a great one. Studies are revealing, for example, that some environments lower your blood pressure more than others, why coastal walks can provide some of your daily vitamins, and how certain terrains can boost your cognition. So, pop on your mental hiking boots and join me as I discover where and how to take the perfect hike.

If you view walking as merely a simple way to keep fit, think again. In the past few decades, evidence has been growing that it can also have mental health benefits. One reason is that it is one of the most sustained rhythmic movements we do. Studies suggest that this rhythm prompts the brain to produce a specific kind of brainwave – theta – measuring at a frequency of around 7 to 8 Hz. These are linked with improvements in memory and cognition, as well as mood. Another reason is that simply looking at nature is good for mental health: relocating to green spaces reduces depression, and being out and about near water can be even more restorative. The commonly cited explanation for this is based on something called "attention restoration theory". It suggests that focusing on tasks and directing our attention is cognitively very energy-intensive, and we can manage it for only a while before becoming fatigued. This fatigue is linked with low self-control and health-related issues such as obesity and depression. Nature provides "soft fascination" – it gently

“

Some environments lower your blood pressure more than others

captures your attention without requiring significant effort – reducing stress and restoring your cognitive reserves. This relaxed state of mind is apparent in brain images, displaying as decreased activity in the frontal lobes and low-frequency brainwaves washing across large regions of the brain.

That is all very impressive, but the latest research indicates that a good walk can give you so much more. To explain, let's stroll into the woods. Surprisingly, it isn't just the sight of trees but also their smell that benefits our health. Trees and other plants release volatile organic compounds (VOCs) to attract pollinators and ward off unwanted animals, and these chemical odours also influence our biology. Take α - and β -pinene, released from common trees in the UK such as the Sitka spruce or Scots pine. When inhaled, the effects of pinene are numerous. These odorants have anti-inflammatory effects, lower blood pressure and reduce stress hormones. Some small studies have shown that they raise the number of natural killer cells in your blood, which are vital for fighting infections and cancer. In animal studies, pinene also has a protective effect against stroke, seizure and heart disease.

Smell's good

If you don't live near a pine forest, fear not. In fact, according to neurobiologist Michael Leon at the University of California, Irvine, a good walk should include as many different smells as possible. "Literally, stop and smell the roses," he says. His research has shown just how important smell is to health. In October, he and his team reported that a loss of smell is linked with at least 139 different medical conditions. They have also shown that sniffing 40 different odours each day can improve ➤

symptoms of dementia, and that being exposed to various odours at night can bolster cognition and improve the health of brain areas involved in memory.

This study also revealed that such “olfactory enrichment” increases activity in the uncinate fasciculus, a pathway involved in memory and language that deteriorates in older age and especially in people with Alzheimer’s disease. It may be that enhancing this area by providing the brain with plentiful olfactory stimulation protects against this decline, says Leon. He argues that people in rich, Western communities are under-stimulated when it comes to olfaction, and this contributes to bad health. “We shower, we spend more time indoors, we don’t smell nearly enough odours as our brains evolved to,” says Leon. “It doesn’t matter what smells you incorporate into your walk – as long as they are pleasant, the more the better.”

Which brings me to the seaside. West Wittering is my beach of choice, a long stretch of golden sand along the Sussex coast. Walking here, I breathe in the salty spray and the aroma from the seaweed and ferns that line the nearby sandbanks. A trip to the coast to take the air has long been recommended for convalescence, and now there is science to back this up. Sea air contains molecules from plants, algae and bacteria that are whipped up by the wind as it sweeps across the surface of the sea, and some of these appear to have many health benefits. In the first study of its kind, published this year, researchers exposed lung cells to doses of sea aerosol collected from the Ostend coast in Belgium – the equivalent of what you would experience while walking along this coastline. This influenced the expression of genes in key cellular pathways, including those that provide a protective response against tumours and inflammation, as well as ones that boost metabolism.

That’s not all. A coastal hike might even provide you with some vital nutrients. Historically, nutrients were thought to be obtained exclusively from our diets, but researchers began to challenge this concept in 2019, arguing that the route of nutrients’ entry shouldn’t matter. Thus, the term *aeronutrients* was born, coined by Steve Robinson at the University of Reading, UK, and Flávia Fayet-Moore at the University of Newcastle, Australia. In a recent paper, they reviewed the evidence showing that our lungs can acquire nutrients from the air, which are then transported by the blood to the rest of the body and brain. They concluded it is likely that

aeronutrients supplement our dietary intake of manganese, vitamins A and B12, and some essential fatty acids. Indeed, a study of children living near seaweed-rich coastal areas found they had far higher concentrations of another nutrient, iodine, in their urine than those whose diets were the same but who lived in coastal areas without seaweed. Seaweed gives off iodine gas, so the researchers suggest the children had breathed it in.

“The studies of sea air are extraordinary,” says writer Annabel Abbs, author of *The Walking Cure*. She especially recommends clifftop walks because they add another element that makes them even better for us. “Not only because of the nutrient-rich sea air, and the abundance of reflected light that boosts the [mood-regulating hormone] serotonin,” she says, “but because the ups and downs nudge us into a form of interval walking training.” Such training, which entails switching between slow and brisk walking speeds, has been shown to improve physical fitness and muscle strength, as well as help people control type 2 diabetes. But it can be dull, and long-term adherence to this kind of training regime is a challenge. Walks that take you over undulating hills force you into doing it without even thinking, says Abbs.

Savannah hypothesis

So, when you walk, it is important to think about the terrain and the smells around you. But don’t forget to also consider the landscape. Recently, I found myself hiking just south of the Scottish border near Kielder Water. I chose to walk there not just because of the plentiful pine trees and flowing waters, but because the hike took me onto wide, open moors that offered views of a very specific “mid-fractal” landscape. Fractals are repeating patterns that appear similar at different scales, and they are relatively common in nature – think of the repeating patterns that form branches and twigs on a tree. Studies show that mid-fractal landscapes – like an open savannah with a few scattered trees, which aren’t too complex or too simple – improve our mental and physical well-being more than other types of landscapes. For instance, when Caroline Hägerhäll at the Swedish University of Agricultural Sciences and her colleagues scanned people’s brains while they viewed landscapes with different fractal dimensions, they found that mid-fractal images increased alpha and beta brainwaves, which are associated with calm feelings and focus.

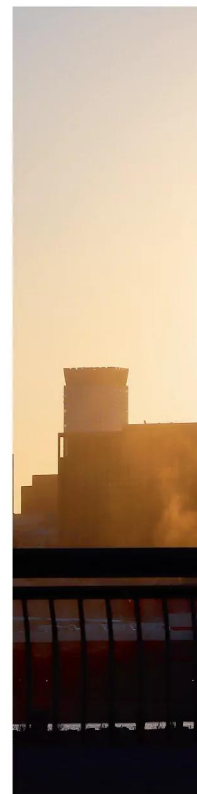
A city stroll (right) is almost as good for mind and body as a walk in the country. Landscapes with savannah-like complexity (below left) are very calming. The benefits you get from ascending a mountain like Yr Wyddfa (below right) depend on how you make the hike

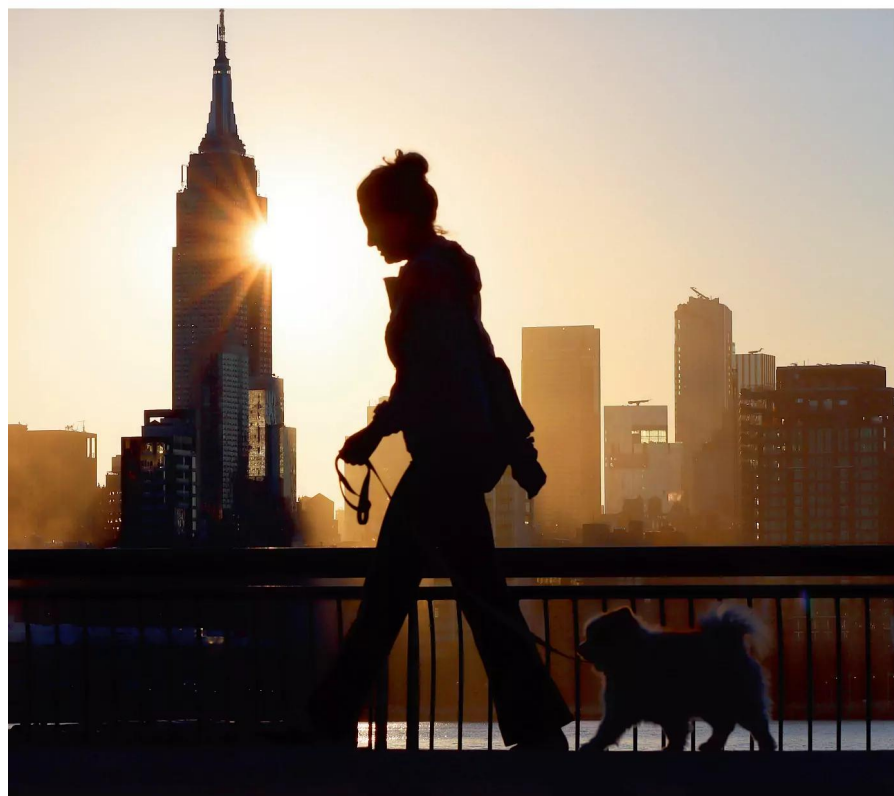


FUNKYFOOD LONDON - PAUL WILLIAMS/ALAMY

Some researchers speculate that our preference for savannah-like landscapes comes from our evolutionary roots, when such environments would have allowed us to spot predators and also provided places to hide. There is no strong evidence to confirm this idea, cautions Kathy Willis, a professor of biodiversity at the University of Oxford and author of *Good Nature: The new science of how nature improves our health*. Nevertheless, it has convinced her to change her walking routes: “If I have the chance, I head towards the meadow near me – an open landscape with scattered trees – rather than going towards the dense forest.”

You might be thinking, OK, but I live in a city; I can’t just pop out to a meadow or moor or clifftop. That isn’t necessarily a problem, says Ulrika Stigsdotter, a professor of landscape architecture at the University of Copenhagen,





GARY HERSHORN/GETTY IMAGES



GEOGRAPHY PHOTOS/UNIVERSAL IMAGES GROUP VIA GETTY IMAGES

“
A 20-minute
walk in green
space is all you
need to feel
less stressed

Denmark. “People think that you have to walk in green fields to benefit your health, but actually, there’s lots of evidence to suggest that walking round cities is good for you too.”

Her team compared the benefits of a walk through a botanical garden in Copenhagen with one in the city’s centre. They took various measures of health, including blood pressure, heart-rate variability and psychological measurements of mood, both before and afterwards. A stroll through either landscape was more restorative than sitting on a bus or being at an office. While the garden walk did generally score highest on each measure of health, “the urban environment came very close”, says Stigsdotter. She notes that although it may not have been green, it had stunning architecture and a poignant history, which might have contributed to how

restorative people found it. Conversely, she says, a busy park won’t necessarily offer the attention restoration we are after. “You can’t just say urban spaces are bad and green spaces are good.”

Town vs country

Nevertheless, if there is a chance to get out of the city, do take it. As researchers delve deeper into the details of what makes a good walk, non-urban environments consistently seem to win out. Group walks across farmland, for instance, lower stress more effectively than those taken in cities. The diversity of the wildlife present on our walks also seems linked to how good we feel afterwards, with more biodiversity increasing our well-being. Relatedly, in a small study, people who took

a 1.8-kilometre lunchtime stroll in nature had significantly better heart-rate variability the following night than those who walked in a built-up urban area, suggesting their bodies had recovered better from the stresses of the day.

While popping out for my own lunchtime stroll, another question occurs to me: for how long should I walk? Do we inhale enough VOCs from a quick circuit around the park? And, aside from the physicality of it, are there any benefits from doing a much longer walk – the marathon charity walk a friend recently suggested, for instance, or a week-long hike along Spain’s Camino de Santiago trail, as my in-laws do each year? According to Willis, a short walk is enough. “The evidence is now quite strong regarding stress hormone changes – a 20-minute walk in green space is all you need to start seeing an effect, you’ll feel much more relaxed,” she says.

Walking for longer might provide more lasting benefits, though. Japanese researchers have shown that people who spent six hours walking in pine forests over three days had significant increases in natural killer cells and decreases in stress hormones – and that these effects lasted for at least seven days. Many people say they also benefit mentally from long-distance walking, and a study of middle-aged and older people seems to confirm this. It found that “by providing a distinctive room for reflection, long-distance walks can help people [in ways] similar to professional counselling”. This reflection might come from experiencing a flow state during long walks: research reveals how this deactivates regions of your brain’s prefrontal cortex responsible for making plans and actioning thoughts, promoting feelings of focus and calm.

And a study of Appalachian trail hikers found that almost two-thirds reported experiencing flow at some point during their walk.

My ascent of Yr Wyddfa isn’t quite so ambitious. But, when I reach the top, I watch as people stop to look at the views, take a detour to see a rare Snowdon lily or wait in line to take a selfie at the summit, and I wonder what part of their physiology has been affected by how they decided to walk today, and how I have benefited from my choices. Ace of Base certainly isn’t for me – but I will be taking time to smell the lilies on the way down. ■



Helen Thomson is a freelance writer based in London, UK, and author of *Unthinkable: An extraordinary journey through the world’s strangest brains*