Putting yourself
on the map

The first free and open map of the world is empowering previously
ignored communities in Kenya, Tanzania and Uganda. **Ben Parfitt** reports

Look at many official maps of Nairobi and you won't see any sign of Kibera, Africa's largest slum. Dar es Salaam, the largest city in Tanzania and one of the world's fastest growing cities, has little geographical data to plan for basic service provision. Uganda was last mapped in its entirety under colonial rule. But now, a bottom-up mapping revolution is righting these cartographical wrongs.

In 2004, Steve Coast, a computer scientist from University College London, launched OpenStreetMap (OSM) with the lofty ambition of creating a world map that anyone could use and to which anyone could contribute – the Wikipedia of cartography. 'We're making a map of the world and then we will give that map away for free,' Coast explains. 'If you give people GPS units, aerial imagery and the tools to make maps, they can build the best maps on the planet.'

A network of volunteers and enthusiasts works on the map to ensure that it remains dynamic and up to date. Growth is organic, unplanned and imperfect. Some areas are mapped in immense detail, others remain completely blank in spite of a richness of culture and life on the ground. This unevenness follows the contours of prosperity and, as such, much of the developing world is represented simply as empty space.

However, communities throughout East Africa are leading the way in producing maps of their local areas that are more detailed than ever before. Progress is rapid and empowering. Indeed, according to Mikel Maron, a member of the board of the OSM Foundation, 'East Africa is now a leading example of how OSM can be used in developing countries'.
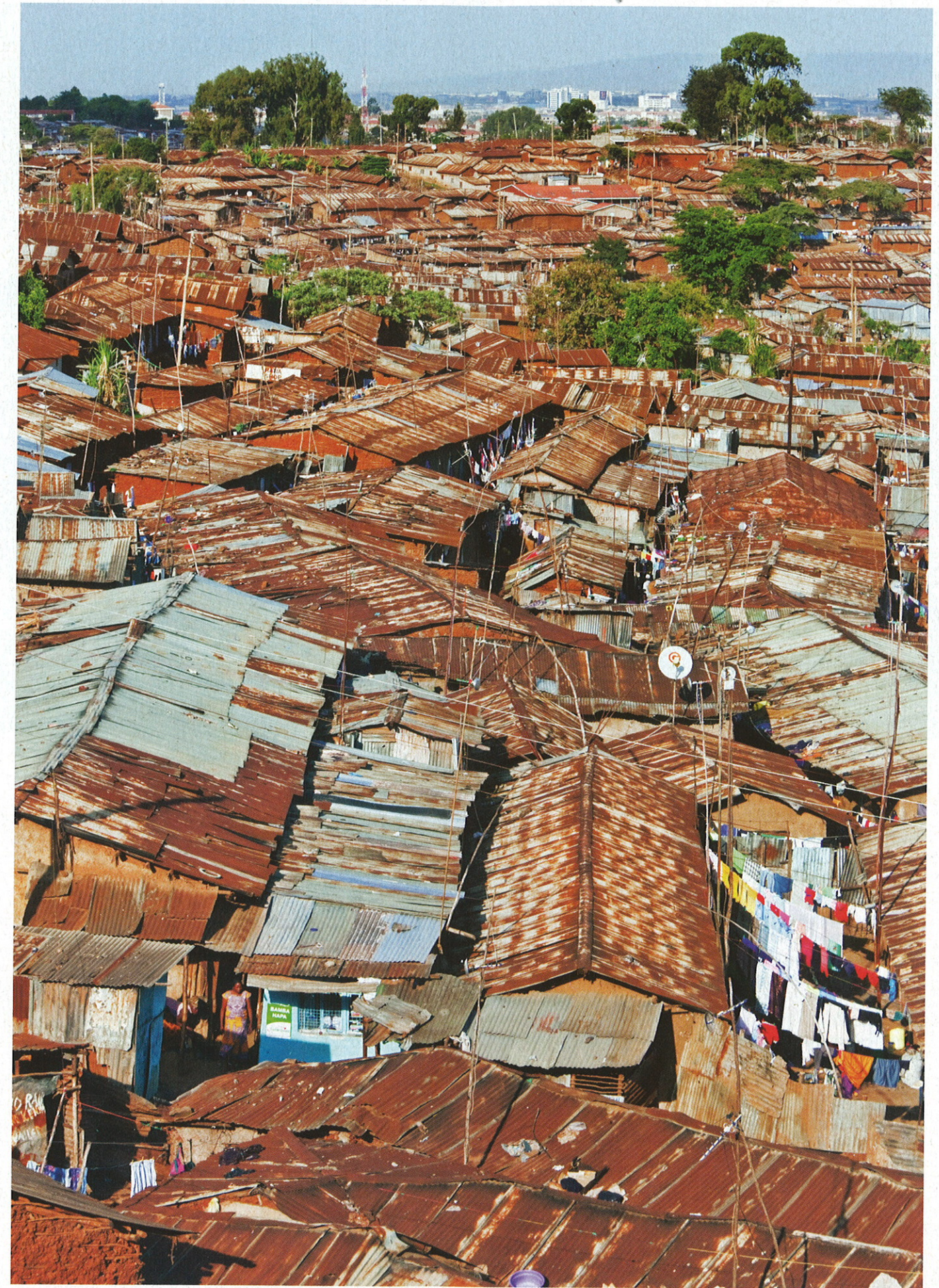
SLUMMING IT

Most estimates put the population of Kibera at about one million people, yet the 2009 census recorded just 170,070, meaning that four out of five Kiberans aren't acknowledged. Lying just five kilometres from the centre of Nairobi, Kibera sits in the shadows – on all government maps, the mosaic of rusted roofs appears as either a blank spot or as the forest it once was.

But in November 2009, a dozen young Kiberans set out to produce the first free and open-source map of their community. By tracing the settlement's tracks and alleys using hand-held GPS units, they revealed the intricate knotted network that lies beneath the seemingly impenetrable blanket of steel roofs. Once that reference network was created, the mapping process was divided into four key themes: health, security, education and water.
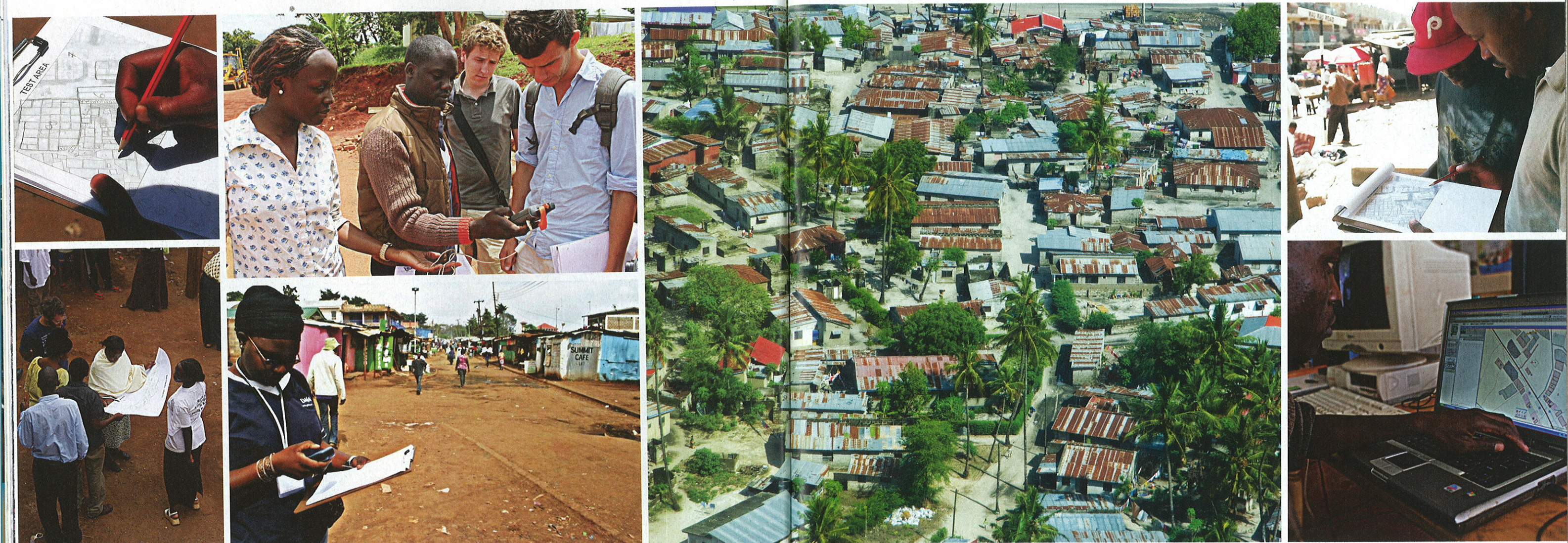
The Map Kibera project was initiated by Maron, who had previously been involved in mapping communities in Palestine. 'Sometime after that, I heard of a crazy, off-hand suggestion to map this slum called Kibera in Kenya,' he says. 'It sounded like an incredible challenge and, potentially, something really beneficial. But I had no idea how much of a challenge it would be.'

Deemed an illegal settlement by the Kenyan government in 1963 and largely ignored since then,

ABOVE: a typical view over the rusted steel rooftops of Kibera in Nairobi, which is thought to be Africa's largest slum. The OpenStreetMap Foundation hopes that its efforts will help to improve the lives of Kibera's residents

NIGEL PAVITT/GETTY IMAGES

> ## 'When I saw the map for the first time, I was proud. This has not been done by others. It has been done by me'

Kibera faces the challenge of breaking down government ignorance. 'Without basic knowledge of the geography and resources of Kibera, it's impossible to have an informed discussion on how to improve the lives of residents,' Marron says.

Since the project began, a 4,450-square-metre site has been subject to government improvements and a police post has been set up in an area that the mappers identified as being particularly unsecure. These small improvements are symbolic of a larger recognition of the community at large and of the issues that it faces.

But the success of the project lies not just in the material outcomes, but in the act of doing. As such, the project places an emphasis on empowerment through participation.

OSM is ideally suited to achieving this participation, simply because it's available to be edited and updated by anyone with access to the internet. Douglas Nmale, a Kibera resident and editor of the *Kibera Journal*, has been a part of the mapping process since its early days. 'When I saw the map for the first time, I was proud,' he says. 'This has not been done by other people. It has been done by me.'

'The project raised awareness of OSM in many new quarters,' Maron says. 'Almost every week, I'm talking to someone who wants to "do a Map Kibera".'

PLANNING A CITY

Maron's success in Kibera led to his involvement in a larger project to map Dar es Salaam in Tanzania. The project originally came about when the World Bank began looking for ways to incorporate digital technologies into existing programmes aimed at improving infrastructure and services. 'The processes of discussing, planning, and monitoring require a map,' Maron explains. 'The World Bank saw OSM as a way to engage communities in these processes.'

Of course, each place is different, and the project in Dar es Salaam was always unlikely to be a carbon copy of its predecessor. 'But I was surprised at how different Tanzania was from Kenya,' Maron says. 'The proposal involved a partnership between the

CLOCKWISE FROM TOP RIGHT: two Kibera residents use paper maps to create the first detailed map of their market place; a Kenyan volunteer uploads new data to OpenStreetMap; informal suburban development in Dar es Salaam; a Kibera resident plots the location of key buildings and services;
• Kibera residents consult the first paper map of their neighbourhood; a resident maps a test area in order to learn how to use paper maps; computer science students use GPS units and geo-referenced maps to create the first map of their campus in Mukono, Uganda

government of Dar es Salaam, the local school of planning, and the community.' According to Maron, this relationship with the authorities would not have been possible in entrepreneurial Kenya, where the government is distrusted. But in Tanzania, little gets done without government approval and involvement.

'Although they share a language, socially and politically, Tanzania is about as far away from Kenya as you can imagine for a country whose border with its neighbour was only drawn during the last century,' says Erica Hagen of the GroundTruth Initiative – the organisation that facilitated the mapping project. 'The socialist roots in the country, as well as the nation-building efforts of Julius Nyerere, have left their mark.'

While Map Kibera struggled to make an institutional impact due to the tricky political situation, support for the Dar es Salaam mapping project ensured that it has been successful from the outset. 'The upgrading programme was one of the best I've seen,' Maron explains. 'It was focused, participatory in design and supported by the community. The community did a great job mapping, the World Bank welcomed the results and the project was featured in the launch of a new government technology initiative.'

MAPPING A NATION

Working on his laptop in Uganda's capital, Kampala, computer programmer Reinier Battenberg has been both intrigued and inspired by the projects in Kibera and Dar es Salaam. He has been mapping for a little more than a year – since he discovered OSM. 'We are always following the wider East African mapping community. We are interested in what is going on in Kenya and Tanzania,' he says. 'But I think it's a national thing. In your head, it's a matter of saying: "I want to map my country".'

The most recent freely available 1:50,000 map of Uganda – the scale used by the Ordnance Survey for its Landranger series, which ensures that there is significant detail – dates back to 1964. Commercial maps exist, but their data remains closed and can't freely be used. 'You should at least have one map that is owned by Ugandans themselves,' Battenberg says. 'It's their country.'

Battenberg began mapping Kampala in his evenings after work, walking around with a GPS device and geo-referenced paper maps, methodically adding unrecorded details where he noticed them. One day, it would be power lines, the next it would be front gates. 'I'm doing it just because I like to do it,' he says.

NICK FRASER/ALAMY; BEN PARFITT (2); MAP KIBERA (4)

SPREADING THE WORD

The son of a geography teacher, Battenberg hopes to create a community of fellow mappers, while at the same time embedding OSM within Ugandan society. 'At the moment, there is the usual "out-of-the-blue" OSM community,' he says.

This ad hoc community includes an individual who has mapped walking trails in Bwindi Impenetrable National Park in the country's southwest and others who've mapped areas affected by landslides and floods in an attempt to help with emergency rescue efforts. 'We need to bring these Ugandan OSM contributors together,' Battenberg says. 'When an NGO or district office thinks, "We need a map," OSM should be the obvious option.'

Questions remain concerning the best way to spread mapping skills throughout Uganda. 'At the moment, it still requires someone to fly in from outside the country. They then set up a project that can only cover a few square miles,' Battenberg explains. He believes that expanding the current narrow geographical focus will be a big challenge. 'A map should cover a whole country. We want to make the project viable on a national scale.'

It's with this in mind that Battenberg has set up MapUganda. He and his small team aim to train computer science and geography students at the nation's universities. It's hoped that the knowledge and skills will then be geographically distributed once students return to their respective home towns upon graduation. Like seeds in the wind, these ambassadors will disperse, grow and help to spawn a new generation of mappers.

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OSM relies on an organic growth and building a community of mappers, without whom the map would decay. 'It's greatest strength lies in the fact that there's a group of people who really care about making the best map possible and getting it used effectively,' Maron says. 'OSM is more than software and a database, it's a philosophy and a community.'

■ *Visit the following websites to learn more about these projects: www.openstreetmap.org; mapkibera.org; groundtruth.in; mapuganda.blogspot.com* G
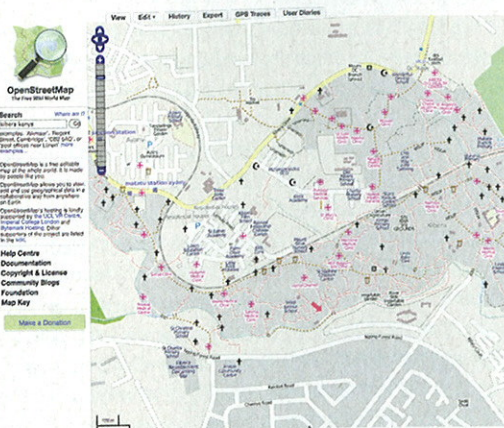
LEFT: a screengrab of the OSM map of Kibera in its early stages gives an indication of the area's diversity and complexity; **ABOVE:** a view of Nairobi from the air. A significant proportion of the African continent has not been mapped since colonial times, and many recent developments have never been mapped at all