Passage through Panama

Elaine Bunting had always longed to transit the Panama Canal and finally got her chance with the World ARC in January. An exciting and at times nerve-racking passage, the canal turned out to be not only fascinating, but also surprisingly beautiful

When it was completed in 1914, the Panama Canal was hailed as the eighth wonder of the world. The world's largest ever construction project, it had taken more than 30 years to build and claimed some 27,000 lives.

Nearly a century later, the canal remains arguably the most valuable through-route in ocean navigation. By carving a short cut through the narrow neck of Central America, it neatly nips off a very long and costly voyage around South America. It has also played a crucial role in globalisation, allowing bigger and bigger ships to carry cargo at decreasing expense. Were it ever to shut, the impact on shipping costs and global economies would be immeasurable.

I have always been fascinated by the canal. It represents the watershed of any circumnavigation; the point of no return for those yachts leaving the Atlantic and heading on to Australia or New Zealand. Once you pass through, the culturally different and vast span of the Pacific – half the world – stretches away ahead of you.

I had read a lot about the transit of the canal over the years and it was something I had always wanted to do.

My chance finally came thanks to the World ARC in January, when I was invited to join Swiss couple Charles and Marie Stutz aboard their Hallberg-Rassy 48 *Dreamcatcher*. Hand on heart, I can say that the journey was a dream come true. Indeed, it is one of the absolute highlights of my cruising experience.

Exciting and at times nerve-racking, the journey is a rite of passage in its own way. From the Caribbean to the Pacific, the canal is 48 miles long and raises vessels to a height of 25m above sea level in a series of six enormous locks that see boats raised and lowered by 27ft at a time.

PANAMA CANAL

Quest of paperwork

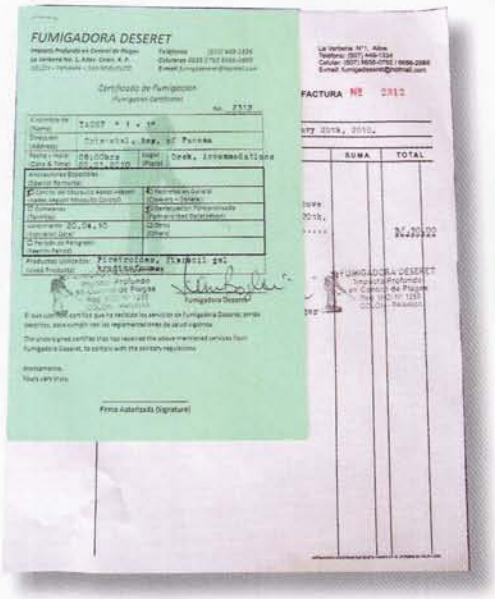
Before you enter those, however, the Panama Canal transit represents a gateway in a different sense too. Because before you can even think about a transit you have to complete elaborate quests of paperwork.

Cruisers divide between those who are prepared to organise a transit themselves – pay the canal fees and make the necessary arrangements for its timing, source the certificates needed and organise the vessel's admeasuring, lines and tyre fenders, etc – and those prepared to pay double the cost for an agent to do it for them.

World Cruising Club used an agent. Experience has taught it that in places such as Panama, Galapagos and French Polynesia an agent makes life simpler, although it by no means relieves all headaches. The most important thing an agent does is to negotiate a time to go through. Crews without one have been known to wait for a slot for two or three weeks at anchor off the suitably named, crime-ridden town of Colón.

An agent also arranges for the boat to be admeasured. It isn't enough to fill in forms with your boat's vital statistics; a measurer must physically assess it and check that the onboard facilities are a suitable working environment for the adviser that each yacht must have on board. I heard of one skipper who was told his yacht wasn't clean enough!

The agent also organises the fumigation certificate that is required to enter Ecuador and Galapagos. The papers were issued to World ARC yachts stating that each had been



A fumigation certificate issued in Cristobal. This was a required and official-looking piece of fiction

treated at Cristóbal (see above). No boat had been to Cristóbal, let alone been fumigated – the certificate is a tax by subterfuge.

The authorities know this and collude with the system in an obtuse way. When the fleet cleared in at Flamenco Marina at the Pacific end of the canal (you have to clear in and out of every port and marina in Panama), the local Department of Health refused to recognise the agent-acquired certificates and demanded different ones. Another $50 per boat, another piece of paper for a fumigation that never happened.

They also demanded yellow fever vaccination certificates from crews even though these are not required officially, for no other reason than an enterprising doctor spied the World ARC flags and with them a commercial opportunity. Agent or not, rally or not – welcome to Central America.

Fast forward, then, to a stage where you've paid for the fees and the extra certification, for the surprise overtime payments and the supplements and for anyone else who is hungry for their cut. You've waited your turn and at last are given a time and a date for the transit.

Adviser on board

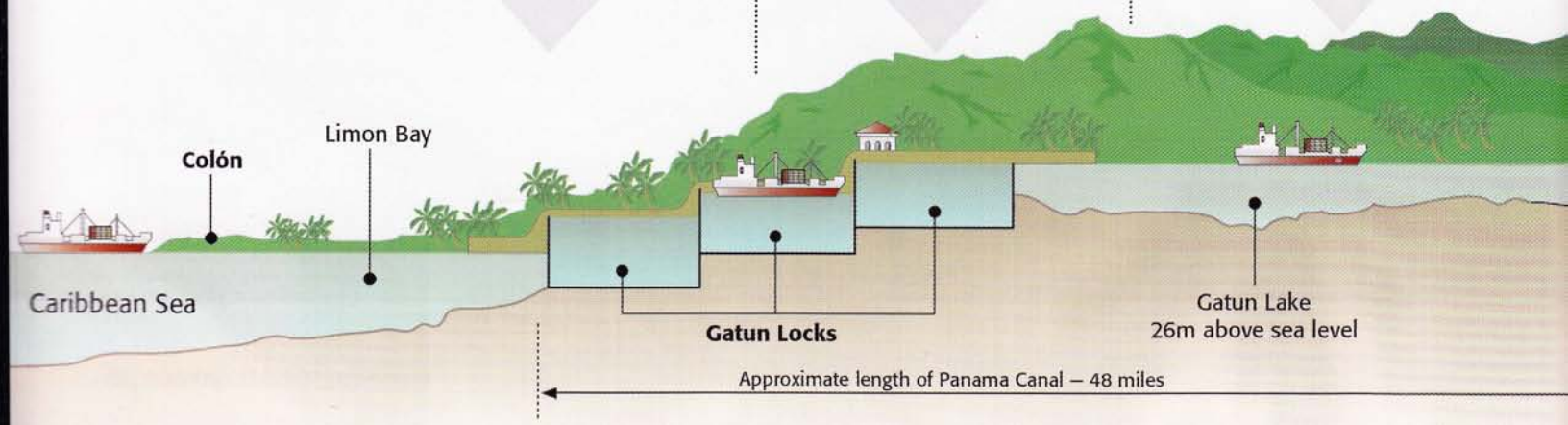
On *Dreamcatcher*, we left Shelter Bay Marina at mid-afternoon on 23 January. The only marina on the Atlantic side, it has recently (and predictably) tacked on a surcharge if you use an agent. With 14 other yachts, we motored a couple of miles up-channel to an area known as The Flats to anchor and wait for our adviser.

A cheery man who spoke good English was dropped off on board at about 1700. Ahmed was very informative about the canal and pleasant company throughout.

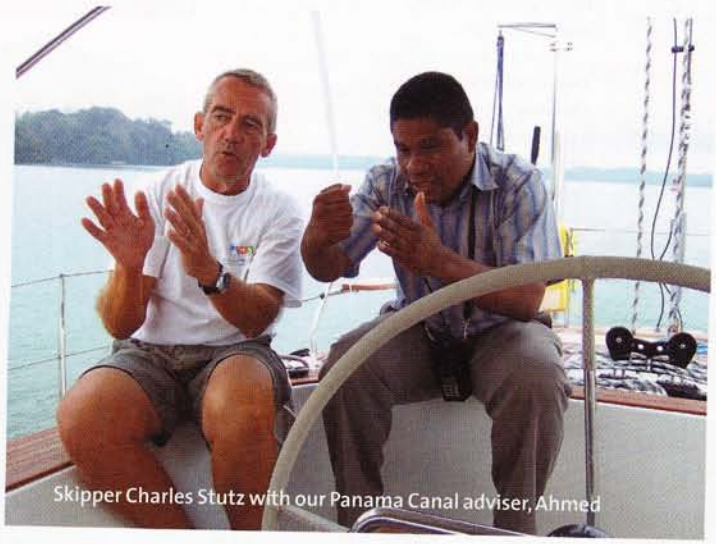
Shortly afterwards, in the gathering dusk, our group of boats was directed to make its way towards the Gatun lock flight. We slowed just before the first of the three chambers and followed Ahmed's directions to raft up with a Lagoon 421.

The canal authorities had already issued 'nesting' arrangements, whereby yachts raft to one another to transit through locks. If a group makes the transit together, they put

Photos: Corbis



> When all 14 of us were in place, the immense steel gates of the first lock were shut and the culverts opened


Skipper Charles Stutz with our Panama Canal adviser, Ahmed

the largest boat or a multihull at the centre of a group of three because it's easier to drive the nest into and out of lock chambers.

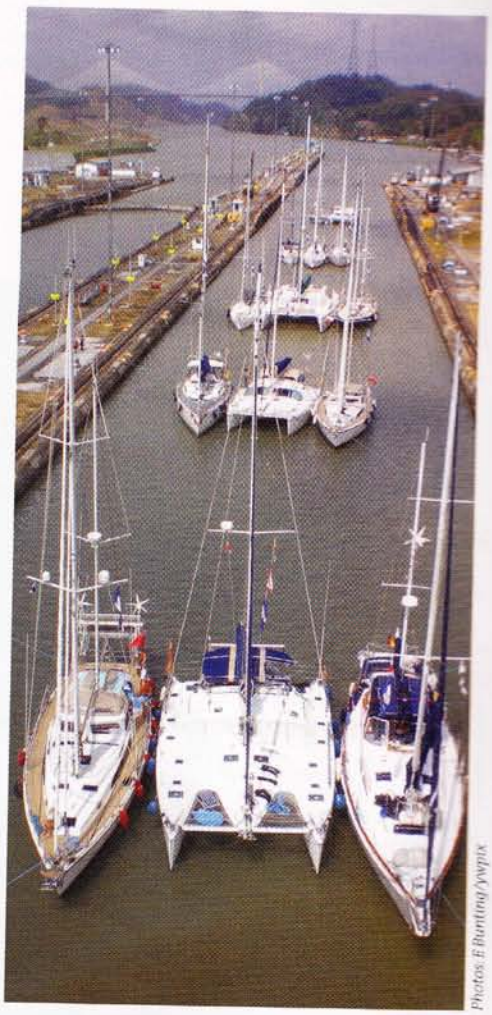
We were in the last trot of boats and were only two abreast. The lead adviser, who is put on the boat that is expected to do the driving, gave precise instructions about steering and engine speed. Charles Stutz kindly let me drive *Dreamcatcher* from The Flats to the Gatun Lake anchorage.

It was soon obvious that the Lagoon 421 could not propel the heavier Hallberg-Rassy, so we switched to become the driving boat.

Each nest of boats enters the locks in turn. Line handlers at the bow and stern each side throw a monkey fist on board. You tie on your lines and they pull them back to make fast on the lock side. It's a highly skilled job – inter-lock competitions are held to see who can throw a line furthest and highest, and the best handlers can hurl a monkey fist through a target from a lock's width away.

Each nest of boats ties up to be centred in the lock. When all 14 of us were in place, the immense steel gates of the lock were shut and the culverts opened. With over 100 million litres of water now pouring in, the turbulence in this first lock was quite severe. Each lock raises vessels up by 27ft, which doesn't sound much, but is huge close up.

The water is filled and drained through 17ft diameter culverts which run each side of the chambers. They feed into a series of 14 cross-culverts, each with five openings, that lock operators use to speed or slow the


Photos: E Bunting/ywpix

The World ARC fleet formed into 'nests' that must group and regroup during the transit going through the single chamber Pedro Miguel locks


Photos: E Bunting/ywpix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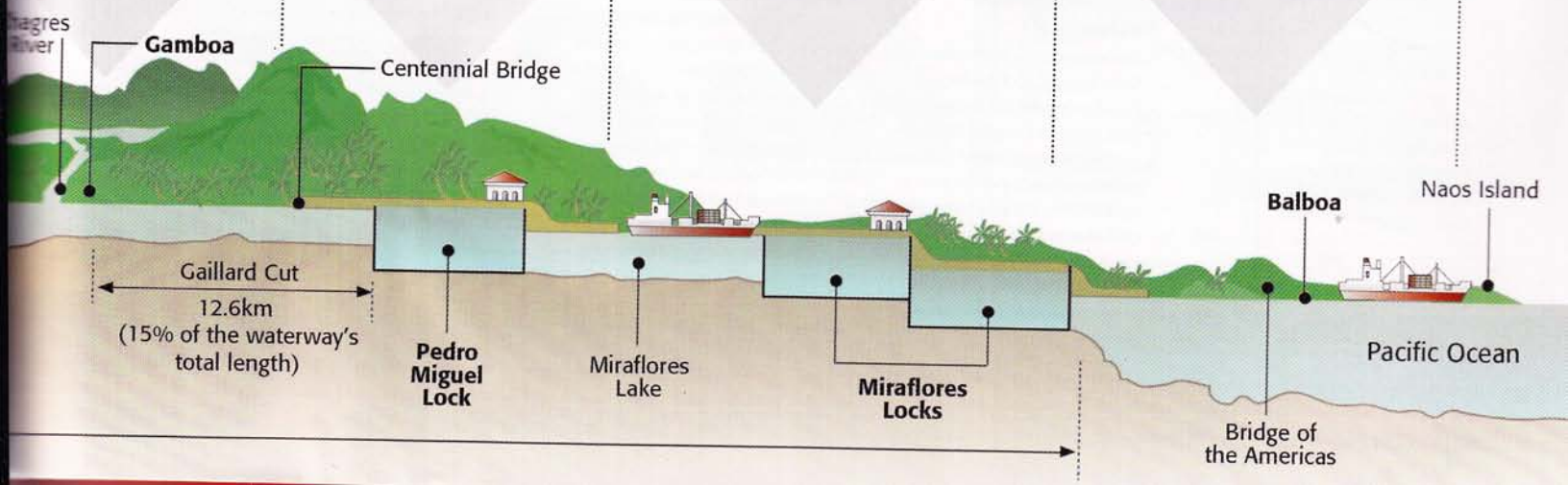


progress of vessels. By directing two main culverts into one chamber, the time per lock is reduced to ten minutes.

When we were locking up, a ship that had been behind us was speeded up, so that it left the third and final Gatun lock ahead of us.

One look at the photo on page 64, which shows the Gatun flight being built at the turn of the 20th Century, demonstrates the size of these culverts and hints at the power of the water as it floods in. The groups of workers look tiny by comparison.

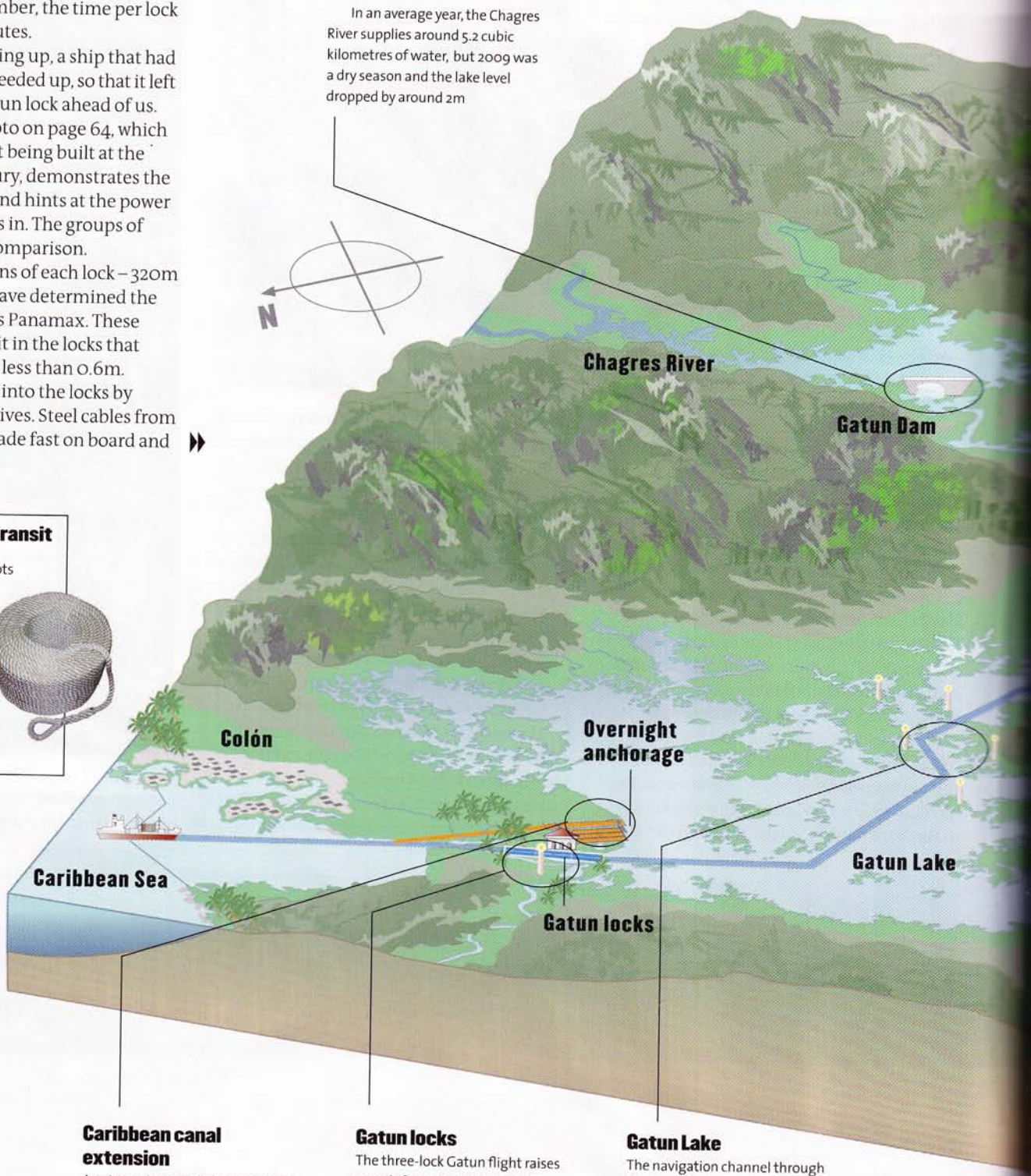
The huge dimensions of each lock – 320m long by 33.5m wide – have determined the shipping size known as Panamax. These ships are such a tight fit in the locks that they clear each side by less than 0.6m.

Big ships are pulled into the locks by diesel electric locomotives. Steel cables from the locomotives are made fast on board and ▸▸

Feeding the canal water

The Chagres River is dammed in its central part by the Gatun Dam. It was completed in 1914 to flood the land below, creating the man-made Gatun Lake.

In an average year, the Chagres River supplies around 5.2 cubic kilometres of water, but 2009 was a dry season and the lake level dropped by around 2m



What you need for a transit

- An engine capable of 5 knots
- Four 100ft 22mm diameter warps. If using an agent, these are supplied
- Plenty of big fenders
- Four line handlers plus skipper

Getty Images

The canal 'mule'

Electric locomotives are used to move large ships through the locks. They run on a rack and pinion system that ascends between chambers (shown here). They use 290hp to tow ships using steel hawsers. The planned canal extension (right) will use tugs instead.

Caribbean canal extension

A cut running parallel to the Gatun locks forms part of the Panama Canal extension due to open in 2014 (see details, right). It will use a different arrangement of three lock chambers to raise vessels a total of 26m. The extension uses part of an old lock excavation site started by the US in 1939

Gatun locks

The three-lock Gatun flight raises vessels from sea level up to the Gatun Lake, the highest point of the transit. As a runaway ship might hit a gate, unleashing the force of water in the lake above and flooding land downstream, there are double lock gates at each end separated by 21m. Originally there were also chain barriers

Gatun Lake

The navigation channel through the canal is buoyed with channel markers and lighthouses. The dredged channel is wide enough in this area to allow two Panamax size ships to pass and there are special areas where stricken or disabled ships can be beached in an emergency

e canal cost US$639 million to build ■ THE AVERAGE WORKER'S PAY WAS $1 A DAY ■ Fastest transit in 1979 by a US Navy hydrofoil, *Pegasus*, in two hours ■ THE LOWEST TOLL EVER PAID WAS BY THE AMERICAN RICHARD HALLIBURTON IN 1928. HE PAID 36 CENTS TO SWIM THE CANAL. IT TOOK HIM TEN DAYS ■

One-way traffic

The Gaillard Cut, originally known as the Culebra Cut, is a 12km section of the canal cut through rock. It is the narrowest point and today's supertankers are restricted to one-way navigation. It is being widened and dredged as part of the extension project

Pacific lock extension

The Pacific Post-Panamax lock flight is being blasted out of rock on higher land to the west of the current canal route and its case loads are calculated to allow it to withstand an earthquake without flooding land below

Shelter belt

The Amador Causeway connects four small islands at the Pacific side of the canal. It was created using over one million cubic metres of rock blasted and hewn from the Gaillard Cut

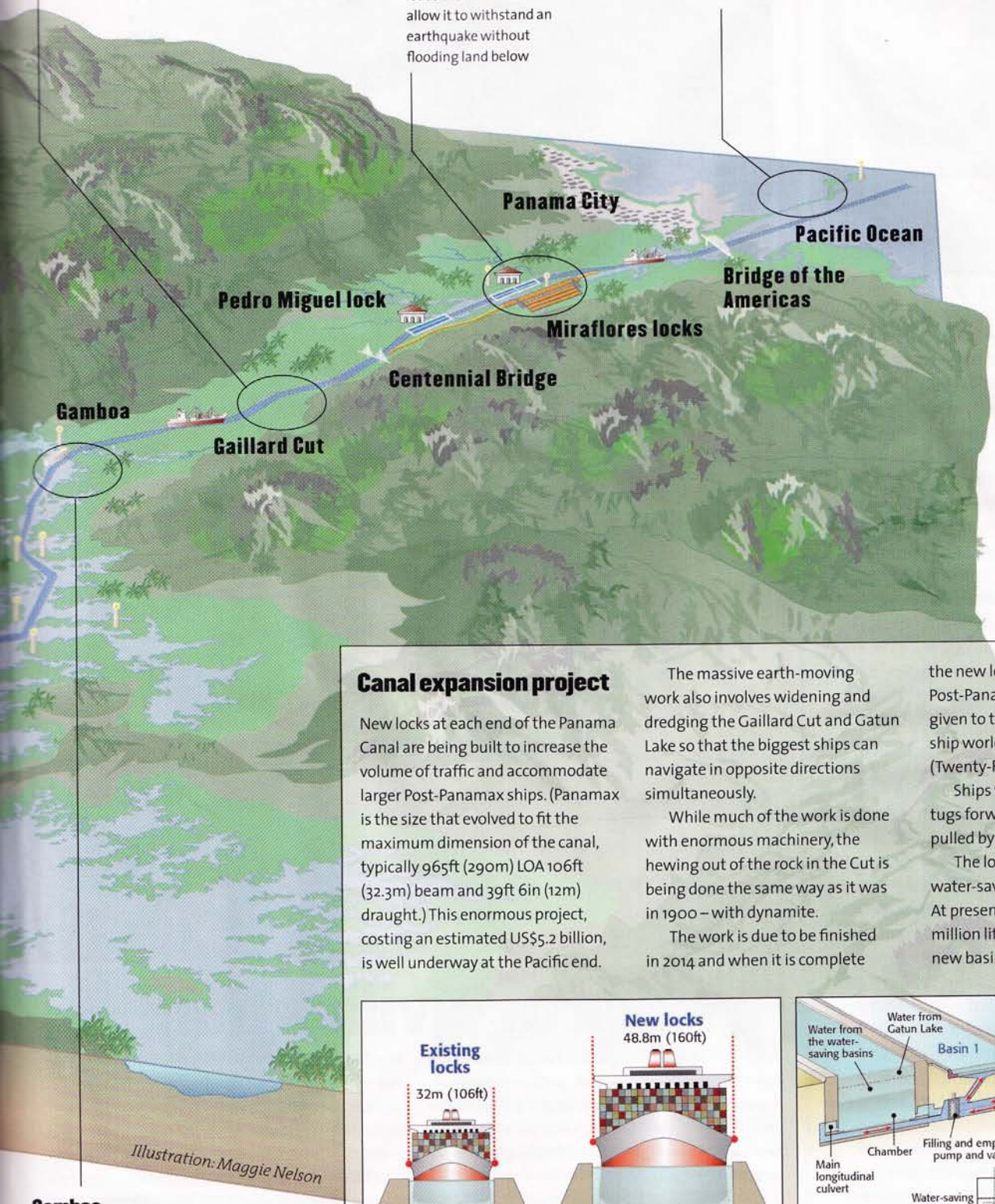


Illustration: Maggie Nelson

Gamboa

The settlement of Gamboa is a township that was built to house non-white employees of the canal and their families. Today, it is the centre for some canal maintenance as well as dredging operations

What it costs

Immigration visa fee: US$15.
Entry fee, health inspection and *zarpe* (cruising permit): approx US$110.
Canal fees:
Up to 50ft – $500
Up to 80ft – $750
Up to 100ft – £1,000
Up to 125ft – $1,500

These fees include a contingency (buffer) fee of US$891 as well as the $55 security charge and $54 admeasurer fee.

Yachts over 65ft must have an AIS transponder. These can be hired from the canal authorities.

More information from **www.pancanal.com**

Canal expansion project

New locks at each end of the Panama Canal are being built to increase the volume of traffic and accommodate larger Post-Panamax ships. (Panamax is the size that evolved to fit the maximum dimension of the canal, typically 965ft (290m) LOA 106ft (32.3m) beam and 39ft 6in (12m) draught.) This enormous project, costing an estimated US$5.2 billion, is well underway at the Pacific end.

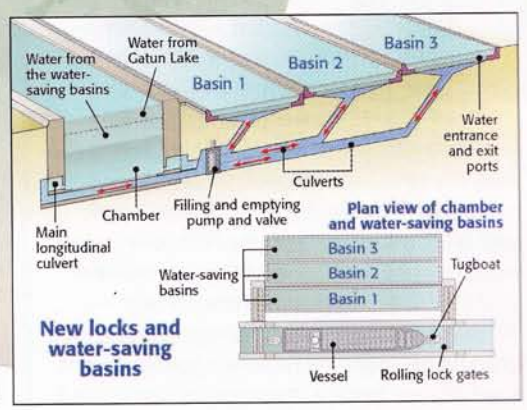
The massive earth-moving work also involves widening and dredging the Gaillard Cut and Gatun Lake so that the biggest ships can navigate in opposite directions simultaneously.

While much of the work is done with enormous machinery, the hewing out of the rock in the Cut is being done the same way as it was in 1900 – with dynamite.

The work is due to be finished in 2014 and when it is complete the new locks will accommodate Post-Panamax ships, the name given to the giants of the container ship world that exceed 10,000 TEU (Twenty-Foot Equivalent Units).

Ships will be towed through by tugs forward and astern rather than pulled by locomotives.

The locks will fill and empty using water-saving basins, as shown below. At present a ship uses about 200 million litres of water per transit. The new basins will use 60 per cent less.



■ THE AVERAGE SHIP TRANSIT TAKES EIGHT TO TEN HOURS ■ The top 5 countries to use the canal in order are the US, China, Japan, Chile and South Korea

Post-Panamax ships (see above) will be able to transport the same amount of cargo as 18 trains of 8,000ft, 5,800 lorries or 570 Boeing 747s

adjusted by windlasses on the trains. There are six locomotives per ship, four on bow lines and two at the stern, and they run alongside the edges of the locks on a rack and pinion system.

Surprisingly, the adjustments needed for such tight clearances aren't computerised – it's all done on voice command.

Into Gatun Lake

We arrived in Gatun Lake at about 2100 and were directed to anchor in a dark quiet spot around the corner. As Ahmed was taken off the boat, he told us that, with luck, we might hear monkeys during the night.

I thought he was joking, but as soon as dawn broke the following morning the misty air filled with deep, angry bellows. We were told later that the monkeys were quite small. You could have fooled me.

The pilot boat returned at 0600 and with the same advisers back on board we set off to motor across the lake – about 30 miles of the journey.

Nothing had prepared me for the beauty of Gatun Lake. The morning mist cleared slowly to reveal lush jungly islands and a beautiful and intricate network of uninhabitated islands, inlets and bays.

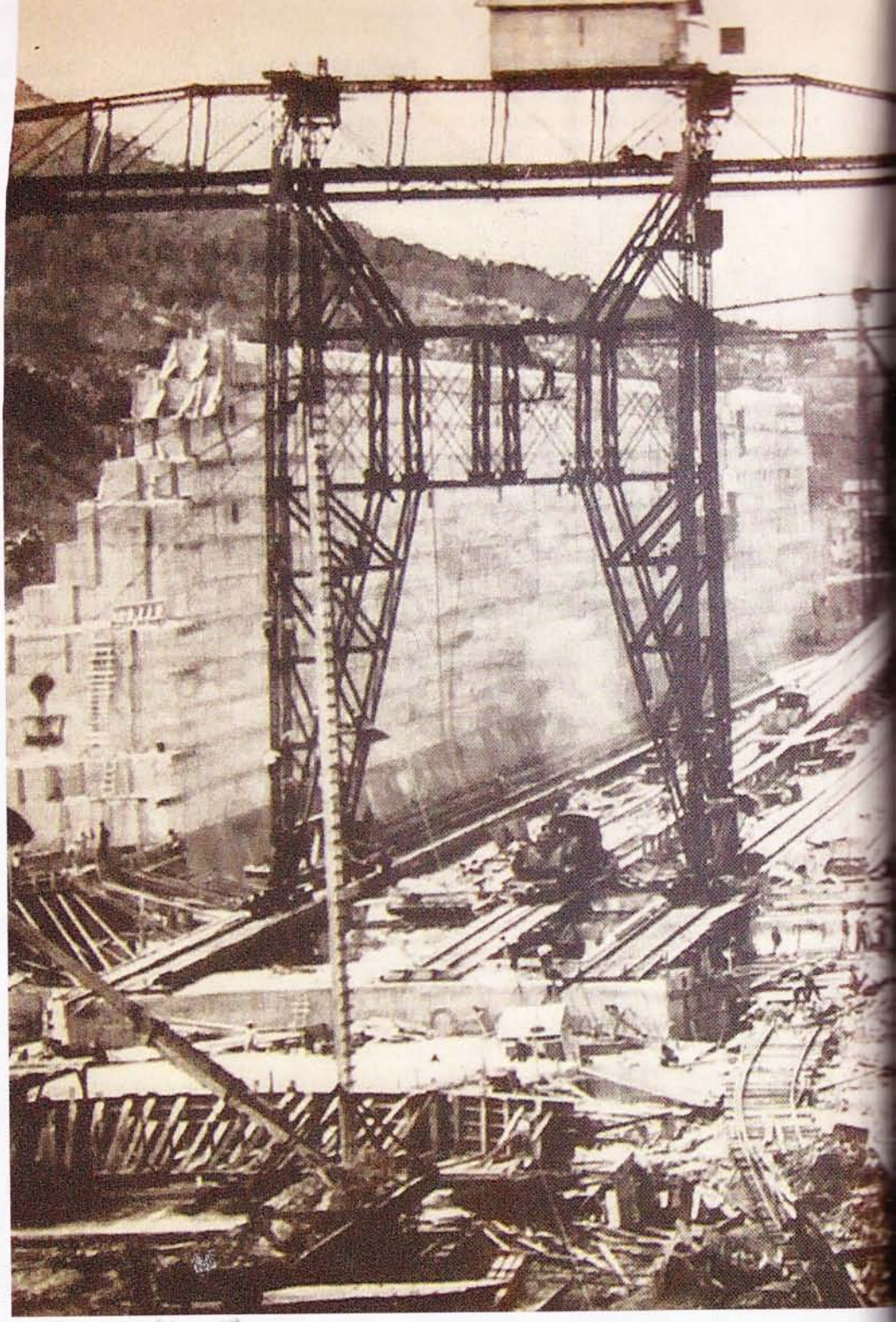
It seemed absurd to see huge ships on this unspoilt expanse. Yet the volume of ship traffic belies the rich flora and fauna here – indeed the Smithsonian Institute has a research station on Barro Colorado island. Alligators cruise around and pumas and jaguars are known to swim out to islands.

In the early afternoon, we reached Gaillard Cut, the narrowest part of the canal, the stretch through bare rock where most lives were lost during the building work and where the biggest ships today are required to observe one-way traffic.

Corbis

That leads to the single Pedro Miguel lock, where we nested again and made our first 27ft descent. This was a much calmer and easier business than locking up. A short distance after that there were the twin Miraflores locks and after two more chambers we were out. Then after motoring under the Bridge of the Americas, which carries the highway between the two continents, you're out into the ocean.

As you leave the canal, the water colour changes, deepens, clarifies. By the time you reach the anchorage at Naos Island or Flamenco Marina around the corner, it is a lustrous deep purple-blue. You've left the Atlantic and transited the canal – now the immense expanse of the Pacific lies ahead.



'A work of civilisation'

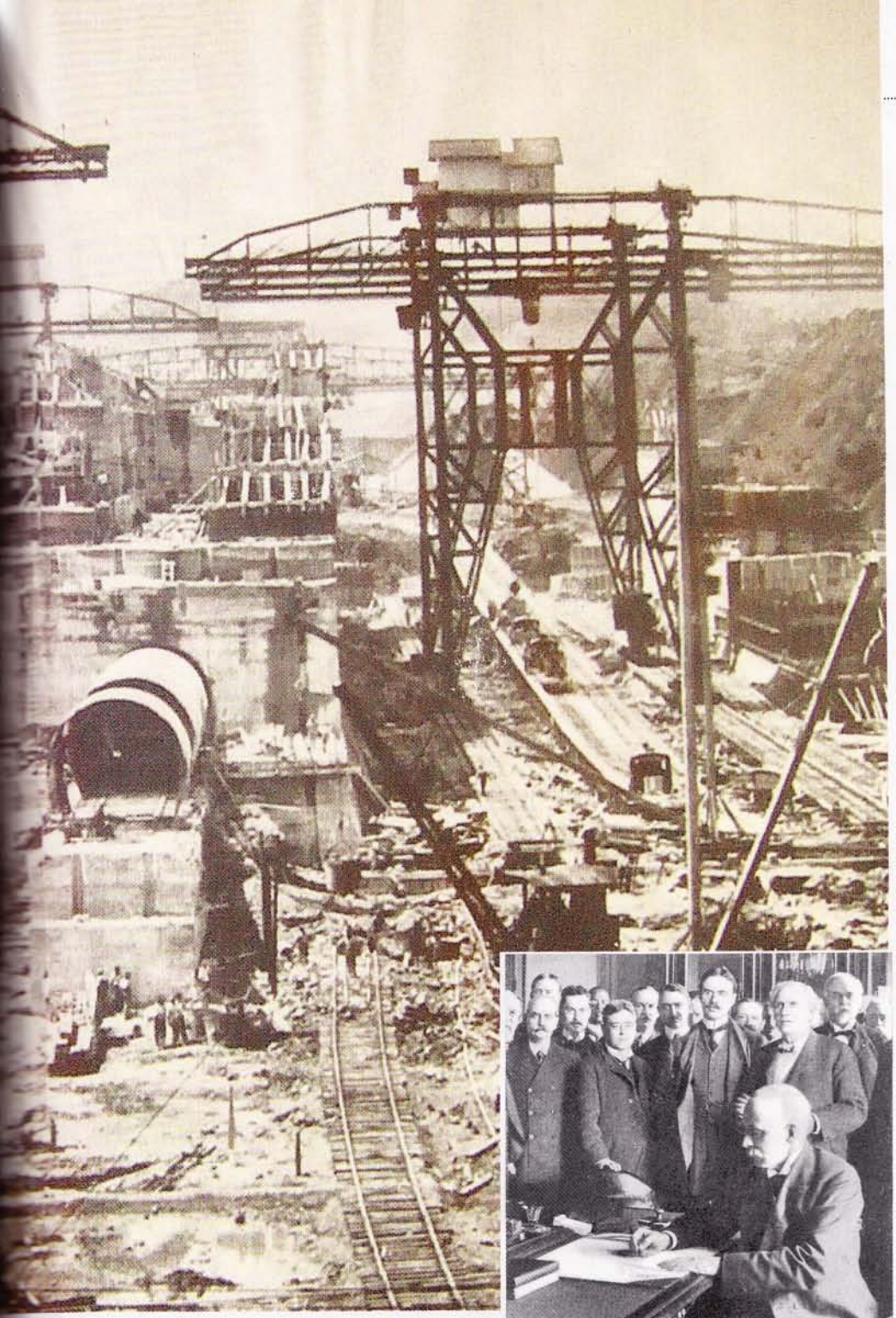
The story of the building of the Panama Canal is an epic tale of exploration, death, politics and money. It spans more than 400 years and its human toll was unimaginable. At least 27,000 people died hewing a path between the seas through solid rock and thick jungle.

The idea of a short cut to the Pacific had first been mooted in the 16th Century, but no practical way of achieving it could be found at that time.

In 1880, Ferdinand de Lesseps, the Frenchman who masterminded the Suez Canal, championed a plan that had been proposed by Baron Godin de Lépinay, an aristocrat and engineer from the French Department of Bridges and Highways. The idea was to build a series of locks and go through the Gatun Lake, which would be filled by damming the upstream Chagres River. It would take six years and cost US$100 million, he suggested.

In the end both the timescale and cost were well over six times that. From hacking a route through dense jungle and mosquito-plagued swamps to hewing out the Culebra Cut (later renamed the Gaillard Cut) from solid rock, the labour of taming unruly nature was as backbreaking as it was dangerous.

In 1893 the French scheme was abandoned and in 1904 a treaty was signed to allow the US to build and adminster the canal indefinitely. Work continued with American engineers, following de Lesseps's proposed route and scheme of locks.



The Gatun flight in construction showing the scale of the locks and culverts. Right: signing the treaty that gave the canal to the US for $40m in 1904

Mary Evans

At the peak of construction, 19,000 workers toiled on the canal at a time, most from Barbados. At one point the death toll from disease was so high that construction was scaled back for nearly a year to make public health improvements.

The idea that mosquitoes spread malaria was then controversial. Yet the Canal Commission's head of hospitals and sanitation, Colonel William Gorgas, organised a major programme to drain and fill swamps while instigating quarantine for infected people – both pioneering moves. The health programme alone cost US$20 million.

By the time it opened in January 1914, the canal was by far the largest and most expensive construction project in history. Over 200 million cubic metres of earth had been excavated.

In his excellent book *The Path Between the Seas*, the definitive history of the canal, author David McCullough wrote: 'The 50 miles between the oceans were among the hardest ever won by human effort and ingenuity, and no statistics on tonnage or tolls can begin to convey the grandeur of what was accomplished.

'Primarily the canal is an expression of that old and noble desire to bridge the divide, to bring people together. It is a work of civilisation.'

Controlling the canal

I visited the canal's nerve centre at Balboa, outside Panama City, to gain an insight into how the waterway is controlled. Screens on the back wall (above) display all vessels in the canal at a time, their estimated time of arrival at each checkpoint or lock and their actual time of arrival. Such close monitoring ensures that, as far as possible, everyone is compliant with the schedules and if not that controllers can readjust all timings.

The schedule is devised 24 hours in advance and is based on the vessels' beam, length, draught, pilot requirements, restrictions and need for lock locomotives, while also aiming to transit the maximum number of vessels each day.

The big screen to the left in the photo at the top of the page shows AIS information from each ship, giving the operations staff real-time data of a vessel's location, course and speed.

Whiteboards (shown above) display pilot assignments. This also shows vessels in transit with their ETA and actual times, as well as which pilots are aboard and their qualifications. Ships might have one, two or three pilots.

Transit fees can reach US$300,000 for the biggest ships and cruise liners – that's without the agent's fees, of course.

At the moment, around 37 ships are transiting each day. That's partly because the Gaillard Cut is a pinch-point and there has to be one-way traffic for Panamax vessels and supertankers.

Capacity can be stretched to up to 47 or 48 ships a day. This is achieved by using locomotives in relay in the lock flights, or by a 'merry-go-round' system with 18 locomotives operating in a loop.