

# River Gunboats: An Illustrated Encyclopedia

*by*

**David Stark**



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## Synopsis

The first recorded engagement by a steam-powered warship took place on a river, when in 1824 the Honorable East India Company's gunboat Diana went into action on the Irrawaddy in Burma. In the 150 years that followed, river gunboats played a significant part in over forty campaigns and individual actions. This lavishly illustrated encyclopedia describes vessels of every nation designed as river gunboats, plus those converted river steamers which took part in combat. Their story is brought up-to-date with data on current riverine combat vessels in service today.

## Sort review

"For anyone with any interest in the gunboat as a concept, or in river campaigning in general, this book will be invaluable. The collection of so much information in one place is clearly the result of well-directed research over many years on the part of the author." --Warship  
"This is a book that would grace both the coffee table and the reference shelf.... Recommended." --Thomo's Hole  
"This detailed study lists the specifications and history of gunboats around the world. The entries include ships from centuries past up to the present day. There are hundreds of illustrations and line drawings and two appendices covering pain schemes and the gunboat in popular crime." Military Heritage  
About the Author  
ROGER BRANFILL-COOK is a qualified battlefield guide, a professional translator from French, and a writer on military subjects. His most recent book was *Torpedo: The Complete History of the World's Most Revolutionary Naval Weapon*.

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## Look inside the book

RIVER GUNBOATS Austro-Hungarian Monitors Szamos (foreground) and Leitha (background) as they appeared during the First World War. (Photo courtesy of Erwin Sieche)

RIVER GUNBOATS AN ILLUSTRATED ENCYCLOPAEDIA  
ROGER BRANFILL-COOK  
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The earliest British river gunboats were officially owned by the Honourable East India Company. However, they operated under Royal Navy control during their various operations, and are to be found in the Great Britain chapter. Conversely, the river gunboats used on the Nile flew the Egyptian flag, and will be found in the chapter on Egypt. The breakup of the Austro-Hungarian Empire, the collapse of Yugoslavia, and the capture of vessels in the course of conflicts, meant that many river gunboats passed through several hands, and through several modifications. Their chronological history is followed through the various individual country chapters.

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Angola  
Argentina  
Austria post-1918  
Austria-Hungary  
Belgium  
Bolivia  
Brazil  
Bulgaria  
Burma/  
Myanmar  
Cambodia  
Cameroon  
China  
Colombia  
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INTRODUCTION  
Inspiration  
Like many of my generation, my own interest in river gunboats began with Robert Wise's masterful film interpretation of *The Sand Pebbles* in 1966. Who could forget Steve McQueen's 'Hello Engine', or the desperate fight at the barrage of junks, when Richard Crenna's Captain Collins tries to redeem his small gunboat's honour? The same year came the depiction of General Gordon in Khartoum, with the mystery of what happened to his gunboat *Abbas*, despatched to fetch help. The reissue on DVD of the classic Korda 1939 colour movie *The Four Feathers* reminded us that Kitchener's old gunboat *Melik* was still with us. I was two years old when John Huston filmed *The African Queen*, but I came to know and love it

when the classic movie was screened on British TV nearly every Christmas holiday. Thus began my fascination with the lake gunboats of Africa. Defining the Scope of this Encyclopaedia

Mounting a cannon on any small oared craft capable of carrying it immediately transformed it into a 'gunboat'. The size of the Danube meant that some river gunboats employed there were in fact small sailing warships. The restrictions of most rivers, however, ruled out the use of sail power, and the size and weight of cannons increased to the point where oar power also became impractical. The use of the classic river gunboat came into its own in the nineteenth century with the introduction of the steam engine, and this work concentrates on gunboats powered by steam or internal combustion engines, to the exclusion of purely oar or sail power. Now the smaller gunboats could penetrate deep inland, moving upriver against strong currents, attempting the independent passage of rapids in narrow gorges which had previously defied sailing or oared vessels and required, in appropriate cases, assistance by rope haulage from the banks. With the advent of steam power, the gunboat became the smallest type of warship able to project naval power, whether used to protect harbours and coastlines – such as the 'flatiron' type used by the Royal Navy – or for patrol and policing duties, or simply as a 'presence' in far-flung parts of the world. The term 'gunboat diplomacy' came into being to recognise the influence these small vessels could bring to bear. Ocean-going gunboats with relatively deep draft were in fact used to penetrate quite far up major rivers. Their use continued into the First World War period in Mesopotamia, and up to the Second World War on the lower stretches of the Yangtze and other Chinese rivers, where the opposing Japanese and Chinese navies deployed large vessels including destroyers and cruisers. In the case of ocean-going sloops and gunboats, I have provided representative examples of the types of vessel involved. The American Civil War saw the first large-scale use of steam-powered gunboats on the North American river systems. The scope of the conflict also introduced the widespread conversion of commercial riverine craft to warships. For the sake of completeness, this encyclopaedia includes ACW riverine vessels nominally designated as 'rams' if they also carried gun armament, especially behind armour. A contemporary use of armoured river gunboats occurred in China during the bloody civil war which pitted the Taiping rebels against the Emperor, when Gordon set up his headquarters on board the side-wheel paddle steamer Hyson. With the advent of iron construction, the Royal Navy pioneered the technique of constructing a sectionalised gunboat in a British yard, for transport abroad and reassembly at the chosen destination. The prototype was HMS Mohawk of 1843, a side-wheel paddle steamer built to patrol Lake Erie. She was closely followed by her American counterpart USS Michigan. In France Napoleon III proposed and oversaw the production of drawings for sectionalised river gunboats to use on rivers and lakes during his Italian campaign of 1859. Subsequently, the French built large numbers of such craft for river warfare in Indochina and elsewhere. The British continued the trend with two Peruvian gunboats intended for use on Lake Titicaca, which were designed in 1862. The extremely difficult transport of their hundreds of individual parts on the backs of mules – and the carrying of their sectional propeller shafts on the backs of porters – up

the slopes of the Andes, however, meant that the first vessel did not in fact enter service until 1870. The gunboats on Lake Titicaca were examples of the 'pin-built' form of construction, whereby the vessels consisted of hundreds of individual pieces, small enough to be man- or mule-ported over considerable distances. Before leaving the builder's shipyard, the individual hull and deck plates would be trial-assembled to the ribs by bolts. They would then be disassembled, numbered and carefully packed into cases for transport overseas. On arrival on site, the hundreds of parts would be permanently assembled using rivets. The process involved sending skilled supervisors to accompany the kit of parts, and to oversee the work of reassembly by local workmen. On more than one occasion, the design plans would not arrive on site with the kit of parts, providing a major headache for the supervisor. One of the last military usages of 'pin-built' vessels was the overland transportation of the German steamer Graf von Götzen to Lake Tanganyika in 1915, but steamers intended for service on Lake Victoria were transported in thousands of pieces up to modern times. The other form of this type of vessel was the 'knock-down' construction, whereby the hull and superstructure would be pre-assembled in complete sections. Once again, following initial assembly with bolts, they would be dismantled for overseas transport, often on the decks or in the holds of cargo ships. The relatively large size of each section compared with the small parts of the 'pin-built' version meant that they had to be carried on railway or road wagons, or even floated down rivers. In the case of the hull sections, this form of construction often continued to use bolts to hold the sections together. In period photos, the numbers marked on adjacent sections can be clearly seen. Napoleon III's floating riverine batteries were of this type, as were many Nile and China gunboats. In the 1880s the firm of Yarrow, based at Poplar on the Thames, began to specialise in shallow-draft vessels which revolutionised the exploration and colonisation of vast stretches of Africa. Tested on the Thames, they would then be broken down into sections, for shipping and overland transport to the ultimate destination, where they would be bolted together. This system also avoided the problem of deploying a shallow-draft vessel to distant stations when she was completely unsuitable for long ocean transits. Again, the smaller gunboats used in Mesopotamia during the First World War were also broken down for transit. Larger British gunboats, such as the 'Insect' class, would affect long transits suitably lightened and reinforced for the open sea. However, as the French would learn with the Argus, encountering bad weather could mean serious trouble. Yarrow's first type of shallow-draft vessels used stern wheel propulsion, as was common on American rivers. This avoided the complication of burying propellers in tunnels which in certain areas risked being clogged with weeds. Several of the country chapters illustrate variants of his steamers, which featured the classic 'locomotive' boilers, familiar to early railway enthusiasts. His next important contribution to shallow-draft river craft was the invention of the hinged flap arrangement to ensure the efficiency of screw propellers inside tunnels. The perfection of smaller breech-loading guns, and also reliable machine guns, meant that riverine craft in Africa and Indochina could quickly be converted to gunboats, by bolting down armament ranging from a single Gardner or Nordenfelt manually-operated machine gun, then the fully-automatic Maxim

which supplanted them, to small-calibre quick-firing cannon originally designed as anti-torpedo boat armament on larger vessels. The smallest of these was the short single-barrelled 37mm 1-pounder Hotchkiss Model 1885, then in ascending calibre the 47mm 3-pounder, and the 57mm 6-pounder. The more powerful riverine craft would go on to mount the classic 76mm 12-pounder. Some gunboats would even mount 6in guns or larger. This volume describes several vessels which were known to their contemporaries as 'riverine battleships'. At short ranges, considerable firepower could be laid down by the fearsome French five-barrelled 37mm Hotchkiss revolver cannon, capable of pumping out up to forty high-explosive or shrapnel rounds a minute, or by the popular Maxim 37mm Pom-Pom. The modern day equivalents are the chain gun and the Minigun. A relatively heavy armament was always valuable, when for example following rivers where even famous explorers such as Mungo Park came to grief at the hands of aggressive natives. Or when attempting to prevent tribes from invading their neighbours' territory in search of slaves, such as on the Gambia and Niger. Missionaries also tended to ensure their steamers were capable of carrying artillery or machine guns: one leading missionary had been killed and eaten by cannibals, and Arab slavers inevitably resisted Christian do-gooders interfering with their lucrative business. Conversely, if a gunboat was likely to face enemy troops dug in along the river bank, then the classic First World War antidote to trenches was fitted, in the form of short-barrelled howitzers or even army mortars. The rapid and simple conversion of commercial riverine craft to gunboats which began during the American Civil War continued into the First World War period, especially on the vast river systems of Russia. The large numbers of such craft, and their often ephemeral existence – at least as warships – means that I have refrained from attempting the virtually impossible task of listing each and every river craft armed with a cannon or machine gun, but instead have provided examples to give some idea of the types of craft involved. In many cases, specific details of these transitory craft have either been lost, or in fact were never recorded. At the very least, I have attempted to find a photo. But in one notable case, the Hyson used in China by Gordon, to date no illustration has come to light. Also included are gunboats used on lakes, as they were in most respects identical to the types found on river systems, and I have extended the scope to also take in the fascinating 'lagoon gunboats' designed to protect Venice. Maps My original intention was to include colour maps of all the various river systems and lakes where historical and current gunboats were and are used. As my research revealed the enormous scope of my project, and bearing in mind the practicalities of publishing and distributing the finished work, I have preferred to give the space over to the descriptions of all the river and lake gunboats I have found, rather than dedicate many dozens of pages to maps which are freely accessible elsewhere. Reference libraries can furnish historical and modern atlases, and a search on the Internet will quickly pinpoint any particular place or water course mentioned in the text. A particularly valuable resource is the David Rumsey Historical Map Collection. The Sources Previous authors and historians have concentrated on certain narrow aspects of river gunboats. In the United States, the river gunboats of the Civil War have received much attention. China gunboats on the Yangtze and other smaller rivers are now

relatively well-covered in literature. The centenary of the Great War and the turbulence in Iraq revived interest in the Mesopotamia campaigns, and many contemporary reminiscences were revisited. Austrian and Hungarian authors have covered their respective navies on the Danube, but lack of translation into English has hampered their widespread dissemination. A similar problem has bedevilled the sharing of the significant research conducted by Russian historians and enthusiasts. A rich source of information has, as always, been the Internet. I freely recognise the contributions of the many enthusiasts, and I give them credit for their input, which so often has such a limited shelf life before it disappears forever behind the 'Error 404' message, the bane of the surfer's life. A large part of the Bibliography is dedicated to the Websites which provided much valuable information. One site in particular must be mentioned, the vast Navypedia site run by Ivan Gogin, which includes many river gunboats. In the herculean task of compiling his vast encyclopaedia, which attempts to eventually list all the warships from the industrial revolution up to today, in a very few places he has copied inaccurate information, which I have corrected in my own work. Some countries defy all reasonable attempts to find full information. The main country affected is China. Whereas the multitude of foreign China gunboats have always received international attention, conversely the details of historic Chinese gunboats are fragmentary, for the reasons discussed in the relevant country chapter. Over-protective state secrecy does not help the situation with regard to modern Chinese river gunboats. Conversely the Royal Navy never hid its first iron-armoured battleships from view, but flaunted them in full view of their possible French opponents. Hiding them from view could have given the impression that, just perhaps, they had good reason to hide. So little attention has been paid to the subject of river gunboats, that even official sites can lack certain basic details. The most commonly omitted are 'crew complement', 'horsepower' and 'speed'. With their secondary role of transporting troops or police detachments, the complement of a river gunboat could vary depending on the circumstances, from a handful of caretaker crew when not in action to several hundred if space was available. As for speed, high speed is a great advantage on the open sea, and can convey a vital tactical advantage, for example when attempting to out-manoeuvre an enemy formation, or as in the past when launching or avoiding a torpedo or ramming attack. In a riverine environment, the principal requirements are shallow draught and manoeuvrability. Speed is a secondary consideration. It suffices to show a significant surplus speed over the strongest head current to be encountered. In shallow or confined waters high speed is a definite disadvantage. Then there is the psychological aspect. If the object of operating a gunboat is to overawe indigenous peoples living on the river banks, then the bulk of a heavily-armed gunboat moving with slow determination is sufficient. A similar effect is a favourite trick of movie directors, when the camera is deliberately slowed to show a group of heroes 'walking the walk', advancing with determination towards a showdown. Usual riverine maximum speeds ranged from 8 knots to a maximum sprint of 12 to 15 knots. On the other hand, several gunboat crews would discover to their discomfort that low maximum speed often meant they could never make headway against strong currents . . . This is the first work to attempt to cover the subject as fully as

possible at the time of writing. Given the enormous scope it is inevitable there will be gaps and lacunas. My hope is that I will have inspired future historians and enthusiasts to fill these gaps, and recognise the historical contributions of the river or lake gunboat.

Ongoing Developments

Just as with my initial intention to provide maps, when the enormous scope of the subject unfolded to me, I was obliged for space considerations to delete one additional planned appendix, detailing the research and building of model gunboats. Readers who wish to browse these elements to complete the picture will find them on my Website, at [http://www.rivergunboats.com](#), in the relevant pages dedicated to river gunboats. There I will also be posting additional illustrations, and updating new details of river gunboats as they come to light.

Ivoir, September 2017

NOTES ON THE PLANS AND SPECIFICATIONS

With such a varied collection of river and lake gunboats, ranging from sectionalised armed launches to massive riverine ironclads, to keep to a standard scale for the available plans and drawings would be futile. Where space is available the plans have been expanded to fill the page or column width, and virtually all the drawn-on scales have been eliminated. It is a relatively simple matter to reproduce copies of the plans to any desired scale by referring to the specifications. The specifications are as complete as can be found from the various published and Internet references. In some cases details have had to be left blank, for example where the precise dimensions are not all recorded or have been lost. A stunning example of this latter is the displacement for the Lake Baikal icebreaker SS Angara, where the original archive plans in the UK do not specify her tonnage. And neither can the museum which currently preserves her. Length is virtually always overall, which can exceed the water-line length. In a very few cases the length has had to be expressed as 'between perpendiculars', as this is the only figure recorded – and as such is little use for scale modellers. Tonnage is a thorny problem, as many reference works do not specify the system used. I have followed the same procedure, so one must assume that in countries where, at the time a vessel was constructed, the metric system was officially in force, for example France, Germany, Portugal and Spain, then the displacements stated are in Metric Tons. Similarly, for example with British, British Empire, United States, Confederate and Japanese vessels the displacement will be expressed in Long Tons. To convert every single entry from Long Tons to Metric Tons and vice versa was simply one conversion too many, for little positive result. Dimensions, as well as distances, however, have all been expressed in both Metric and Imperial. The following abbreviations have been used to save space. Displ: displacement; L: length; B: beam; D: draught; bhp: brake horsepower of an internal combustion engine; ihp: indicated horsepower of a reciprocating steam engine; shp: shaft horsepower of a turbine; VTE: vertical triple expansion reciprocating steam engine; QF: quick-firer; SB: smooth-bore muzzle-loader; MLR: muzzle-loading rifled gun; BL: breech-loading gun; LA: low-angle gun; HA: high-angle gun; DP: dual purpose HA/LA gun; AA: anti-aircraft gun; AT: anti-tank missile; MG: machine gun; HMG: heavy machine gun; manpad: shoulder-fired AA missile; SA or SAM: surface-to-air AA missile. For guns which are described as, for example '3in L/50', the shell calibre is 3 inches and the barrel length is 50 times the diameter of the shell. A German Pak is an anti-tank gun, KwK is a tank gun, and FlaK is anti-aircraft. The Hotchkiss



revolver cannon is a manually-operated five-barrelled gun firing explosive shells, in 37mm, 40mm, 47mm and 57mm calibres. The Hotchkiss 37mm QF comes in two different barrel lengths: the short Model 1885 which fires the same shell as the revolver cannon has no recoil mechanism. The 'Pom-Pom' is a Vickers Maxim heavy machine gun firing 37mm or 40mm explosive shells, so named for the distinctive sound it makes when firing.

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**ACRE** Armed Launch Independencia This small, ephemeral independent state came briefly into existence as a result of the so-called Acre War between Bolivia and Brazil. The First Acre Republic was declared on 14 July 1899, but the arrival of Brazilian warships at Puerto Alonso on 15 March 1900 put an end to the new Republic. This did not stop the mainly Brazilian residents of the area from rising in revolt against Bolivian rule and declaring the Second Republic of Acre in late 1900, during which the Bolivian armed launch Rio Afuá carried supplies to Puerto Alonso. On 14 October 1902 the Rio Afuá was captured by the insurgents at Puerto Alonso and renamed Independencia. She was subsequently used by the rebels to transport tons of rubber to sell, in order to purchase arms and ammunition. The Third Republic of Acre was declared on 27 January 1903, which led the Bolivian President, General José Manuel Pando, to lead a Bolivian force to combat the Acreans. However, a diplomatic settlement was reached on 17 November 1903 which put an end to the fighting, and ceded the territory of Acre to Brazil. The Independencia, ex-Rio Afuá, became part of the Brazilian Navy.

**ANGOLA** The following Portuguese patrol boats were transferred to Angola on independence in 1975: Antares; Bellatrix class P 366, P 368, P 377 and P 378; Júpiter class P 1134 – P 1137; Argos class P 361, P 362, P 372, P 374 – P 376, P 379, P 1130. For details, see **PORTUGAL**.

**Project 1400ME Zhuk** On 23 January 1977 the Soviet Union transferred to Angola Grif No 35. The model transferred was armed with two twin 12.7mm HMG, and powered by two 1,000hp M-401BT diesel engines. For full details, see **RUSSIA Part II**.

**ARGENTINA** Choele Choele The Argentine Navy recognised the need for gunboats to control its extensive river systems, and in 1869 it purchased the commercial screw steamer Maritiana/Transport for service on the Rio Negro (Black River), which runs for 342 miles (550km) inland from the sea. In October 1869 she was renamed Choele Choele. Choele Choele initially saw service on the Rio Negro, based at Carmen de Patagones. Then in November 1870 she sailed up the Ibicuy following the revolution of Lopez Jordan. After a minor collision with the Brazilian monitor Barroso at Asuncion in 1873, she transferred to the Upper Parana. 1875 found her patrolling the Upper Paraguay, and the next year she was laid up.

Launched: Before 1869 by Fontana Hnos, of Boca del Richuelo. Dimensions: Displ: 65 tons; L: 25m/82ft; B: 5.9m/19ft 4in; D: 1.7m/5ft 7in. Crew: 15–20. Power/Speed: Twin screws; coal- or wood-fired steam engine, 65ihp/4.5 knots. Guns/Armour: 1 × 8-pounder bronze SB/5mm flat iron plates protecting the hull. Fate: Pontoon 1878; sold for scrap 1891.

**ARA Uruguay and Paraná** Paraná and Uruguay were

ordered from Lairds as part of President Domingo Faustino Sarmiento's reinforcing of the Argentine Navy after the war with Paraguay. They were designed as seagoing vessels, but with relatively shallow draught in order to be used on the rivers of Argentina. To protect them in the event of grounding, their hulls were built of iron 1¼in (31mm) thick, sheathed in teak and finally covered in zinc plates. Paraná was delivered to Argentina by an English crew, being commissioned on 2 May 1874. The following September her crew joined the 1874 revolution, but after that failed, she was recovered by the Argentine Navy in the port of Maldonado, Uruguay. She was re-armed in 1879. Between 1885 and 1889, Paraná was employed on the Paraná, Uruguay and de la Plata rivers, and carried out hydrographic surveys. Modernised in 1894, she was sold in 1900, and became the merchant ship Piedrabuena. She was finally wrecked in 1926.

ARA Paraná. Uruguay had a much longer and more varied career, and is still in existence as a museum ship at the time of writing. Completed in 1874, on her arrival in Argentina she was involved in the revolt of the students at the Naval Academy, then in 1875 she carried infantry up the Uruguay River to combat the rebel Lopez Jordan. Rearmed in 1880 and overhauled in England between 1884 and 1886, she divided her time between rescuing mariners in distress on the high seas and patrolling the Uruguay and Paraná Rivers. In 1893 and again in 1900 Uruguay was rearmed with modern Armstrong guns. Then in 1900 she was taken in hand and converted to an Antarctic rescue ship. Her sailing rig was cut down, she was reengined with part of the machinery salvaged from the wrecked destroyer Santa Fe, most of her guns were landed, her magazines were reloaded with explosives to blast a path through ice and with provisions to last a year, and, most significantly, her hull was stiffened by the insertion of eight new bulkheads. With a much-reduced crew of just twenty-seven, she sailed to rescue the survivors of the Swedish Nordenskjöld expedition, who she discovered in October 1903 marooned on Paulet Island and Snow Hill Island. The following year she supported a French Antarctic expedition, then was used on regular resupply runs to the base at Orcadas. Finally laid up in 1926, Uruguay was saved from scrapping, and is a museum ship at Puerto Madero.

Launched: 1873 by Laird Brothers, Birkenhead. Dimensions: Displ: 540 tons; L: 46.36m/152ft 1in; B: 7.62m/25ft; D: 3.35m/11ft. Crew: 104 as gunboat/27 as Antarctic rescue ship. Power/Speed: Single screw; horizontal steam engine, 475ihp + 2,000ft<sup>2</sup> (612m<sup>2</sup>) sail area/11 knots sail + steam, 6 knots steam only. Uruguay 1900: VTE steam engine, 1,850ihp/11 knots. Guns/Armour: 4 × 7in BL on Vavasseur mountings; 1879/1880: 1 × 6in gun + 2 × 90mm. Uruguay: 1893: 2 × 4.7in. 1900: 2 × 4.7in + 4 × 3in. 1903: 4 × 3in; Disarmed. Fate: Paraná sold for merchant use 1900; Uruguay museum ship 2017.

River monitors Los Andes on the left and La Plata on the right, seen in 1901. (Photo from Website )

Los Andes and La Plata Ordered by President Sarmiento in 1872, these two turret ships were intended as river monitors, due to nervousness about using low-freeboard turret ships at sea following the HMS Captain disaster. Nevertheless, they would spend most of their service lives on seagoing expeditions and as guardships in the various river mouths. But in late 1878 Los Andes was part of the squadron which sailed up the Santa Cruz River and landed troops. In the same year her sister was stationed in the Uruguay River. In 1893 in the Paraná

River, Los Andes was seized by revolutionaries, and was being used to run weapons to Rosario, when she was ambushed by loyal warships and knocked out of action opposite Espinillo Island. In 1899 Los Andes was stationed in the Rio Santiago and the River Plate, and in 1902 carried out hydrographic surveys of the Plate. The following year La Plata carried out river patrols. Briefly reactivated during the Great War, from 1923 Los Andes remained derelict and was sold for scrap in March 1931. La Plata was discarded in 1927 and sold to commercial firm Laminación Curia S. R. L. Her hulk was still in existence in 1961. Interestingly, they had ballast tanks which could reduce their freeboard in combat by 6ft (1.83m) in forty-five minutes. Launched: 1875 by Cammell Laird, Birkenhead. Dimensions: Displ: 1,677 tons; L: 55.68m/182ft 8in; B: 13.4m/43ft 11in; D: 3.5m/11ft 6in. Crew: 126. Power/Speed: Twin screws; 2 × compound steam engines, total 1,500ihp/9 knots. Guns/Armour: 2 × 200-pounder/23 cal MLR/255mm turret; 160mm hull. 1883: 2 × 9.2in Armstrong BL; 2 × 3-pounder Armstrong QF; 4 × 37mm Hotchkiss QF. Fate: La Plata sold 1927; Los Andes sold 1931 and scrapped. Independencia and Libertad. Libertad was originally laid down as 9 de Julio, but was rechristened when this name was given to a cruiser. These two interesting vessels were used as coast defence ships, but their original concept was described as that of 'riverine battleships', and they were deliberately given relatively shallow draught to enable them to patrol the river systems of Argentina or, as the report in The Engineer of 18 November 1892 states, 'to go where the ordinary armoured vessel could not possibly follow'. Krupp 24cm main guns were chosen for their main armament, but the gun mountings were of Elswick design and manufacture. Both had a slight tumblehome amidships, which caused the secondary armament to be mounted on sponsons. This had the advantage of making the forward 4.7in guns able to fire directly ahead, and the rear pair directly astern. ARA Libertad in 'as built' condition. Note the open torpedo-launching aperture just forward of amidships. In later years she would lose her bow scrollwork and the lower of her fighting tops. An enclosed pilot house would be constructed on top of her conning tower. The above-water torpedo tubes would be removed, no doubt on US Navy advice following their removal from all American battleships for safety reasons when in combat with other armoured vessels. (Photo from Website ) Their introduction led to a great deal of interest, as they were well-armed and well-protected for their size. It would probably be more fitting to have described them as 'pocket armoured cruisers', but this type of description was still some three decades in the future when they appeared. Despite their designation, they spent very little of their seventy-year existence cruising the rivers of Argentina. One notable occasion was on 29 September 1893, when Independencia was ordered to pursue and recapture the rebel-controlled Los Andes during the combat of Espinillo. By the end of the fight, Independencia had suffered just one hit from a machine-gun round, but Los Andes was flooding from a water-line hit by a 24cm shell from Independencia, and the rebels hid between foreign ships before surrendering. Independencia served as a mother ship for submarines from 1948, before being transferred to the Coastguard for duty as pilot station ship Recalada-Practicos. She was scrapped in 1968. Her sister-ship also became a pilot station ship, Interseccion-Practicos and was scrapped in the same year. Launched: Independencia 1891,

Libertad 1892 by Cammell Laird, Birkenhead. Independencia profile. (Drawing courtesy of The Blueprints) Dimensions: Displ: 2,336 tons; L: 73.1m/240ft; B: 13.53m/44ft 3in; D: 3.96m/13ft. Crew: 155. Power/Speed: Twin screws; 2 × compound vertical steam engines, total 2,897ihp/14.4 knots. Guns/Armour: 2 × 24cm Krupp BL; 4 × 4.7in Armstrong QF; 4 × 3-pounder Nordenfelt QF; 4 × 1in Maxim-Nordenfelt three-barrelled MG; 2 × 18in Whitehead torpedo tubes above the waterline/8in belt 5ft deep, closed by front 8in and rear 6in cross bulkheads; Curved protective deck 1in thick behind the belt, 2in thick at the extremities, curving down at the bow to reinforce the ram and extending to the stern to protect the steering gear; Barbette trunks 8in thick (upper part) and 5in thick (lower part); Main turrets 5in vertical and 3in sloping sections. 1883: 2 × 9.2in Armstrong BL; 2 × 3-pounder Armstrong QF; 4 × 37mm Hotchkiss QF. Fate: Both scrapped 1968.

ARA Paraná and Rosario The firm of Armstrong took over from Cammell Laird, to supply the last pair of armoured river gunboats, Paraná and Rosario. Following the previous 'riverine battleships', they too carried a heavy armament, with a pair of 6in howitzers for shore bombardment, able to drop their shells into trenches and gun emplacements on the river banks. The howitzers were backed up (literally) by two pairs of 12-pounder (3in) QF, but the close proximity as evidenced by the VIP photo below indicates that each group of three would be unlikely to be all fired directly over the bow or stern, due to severe blast interference. Rosario was commissioned on 7 August 1909, and Paraná the next day, but their delivery to Argentina was delayed by a diversion to Boulogne-sur-Mer, for the inauguration of the statue of General San Martín. Both gunboats had active careers patrolling the river systems, and carrying out cadet training on a regular annual basis, except during the Great War. Due to the unrestricted U-boat attacks on merchant ships, the supply of high-grade Welsh anthracite and other British coal was virtually cut off, and in 1917 both gunboats were laid up inactive. They served throughout the Second World War, Paraná being sold for scrap in August 1958. Rosario was sold in December 1959, and was dismantled in 1961 and 1962 in the San Fernando Canal, her teak decking being especially sought after for domestic flooring. Marshal Estigarriba, President of Paraguay, on board Paraná in 1939. Note the breech of the Vickers 6in howitzer to the right, and the close proximity of the muzzles of the two forward 12-pounders on the left. (Photo from Website) ARA Paraná in grey, probably following the Great War. Both sister-ships originally had ornate bow scrolls, but here they have been removed. (Photo from Website) Launched: Paraná 28 April 1908, Rosario 27 July 1908, by Armstrong, Newcastle-on-Tyne. Dimensions: Displ: 1,053 tons full load; L: 76.4m/250ft 8in; B: 9.8m/32ft 2in; D: 2.74m/9ft. Crew: 145. Power/Speed: Twin screws; 2 × VTE steam engines, total 1,300ihp/15 knots. Guns/Armour: 2 × 6in/12 cal Vickers howitzers; 6 × 3in/50 cal QF; 8 × 7.65mm MG; 4 × 75mm field guns for landing parties/4in belt of Krupp cemented; 1in protective deck. Fate: Paraná scrapped 1958; Rosario scrapped 1961–2.

ARA Murature and King These patrol boats were laid down as a class of four minelayers during the Second World War. During their construction, Murature and King were reclassified as patrol boats, leaving the other two vessels, Piedra Buena and Azopardo, to be completed as anti-submarine frigates. ARA P-21 King coming alongside. (Photo: Argentine Armed Forces) Breech

end of the forward 10.5cm DP gun on ARA King, photographed on 19 May 2004 at North Darsena. (Photo from Website )Murature at least was initially armed with four 10.5cm DP guns, the stern two being unshielded. No 3 gun was later changed for a twin Bofors mounting. After service in the Antarctic, in 1947 Murature joined the River Squadron, and two years later became flagship of the River Plate division. King joined the river patrols in 1950. During the revolt against the Peron regime in September 1955, while defending the Rio Santiago Naval Base, Murature shot down a Peronist Avro Lincoln bomber. At that time King was immobilised with her engines removed, but she was towed to the West Dock and covered it against air and ground attack by Peronist forces. Both units spent much of their later careers patrolling the river systems, even visiting the Brazilian Ebook Library. Murature was scrapped in 2014, but her sister survived up until the time of writing, still in service. Launched: King 3 November 1943, Murature 1944, by Rio Santiago Naval Yard. Dimensions: Displ: 1,030 tons; L: 77m/252ft 7in; B: 9m/29ft 6in; D: 4m/13ft 1in. Crew: 130. Power/Speed: Twin screws; 2 × Werkspoor diesel engines, total 2,500bhp/18 knots. Guns/Armour: 4 (later 3) × 10.5cm DP; 4 × 40mm Bofors; MG. Fate: Murature sold for scrapping September 2014; King in active service 2017. Murature class in profile.

**AUSTRIA POST-1918** Following the armistice signed on 3 November 1918 at the Villa Giusti, the entire Austro-Hungarian river flotilla was taken over by other nations. The Hungarians held the majority of the ships, and these took part in the brief fighting between the Communist regime and its neighbours. In April 1920 the victorious Allies finally decided on the allocation of the surviving Austro-Hungarian vessels. The Austrian Republic received no monitors, but were allocated the following river patrol boats: 120-ton type Barsch (formerly 'm'). On 30 July 1920 she was sold to Hungary (in exchange for the 60-ton patrol boat Siofok) and renamed Baja. For her subsequent service, see HUNGARY. Compo (formerly 'n'). She in fact never entered Austrian service, and on 6 October 1927 was sold to Hungary and renamed Győr. For her subsequent service, see HUNGARY. Stör (formerly 'p'). She was commissioned by Austria on 14 May 1921, but on 6 October 1927 was sold to Hungary and renamed Sopron. For her subsequent service, see HUNGARY. 60-ton type Fogas (formerly 'i'). On 6 October 1927 she was sold to Hungary and renamed Gödöllő. For her subsequent service, see HUNGARY. In addition, on 24 July 1927 Austria purchased Siofok (the former Austro-Hungarian Csuka) from Hungary. In Austrian service she did not take up her former name but was renamed Birago.

**1920–1938 Birago** After the Anschluss of 1938, the sole river patrol boat retained by Austria, the 60-ton Birago, was taken over by the German Kriegsmarine. They attempted to put her back into service and bring her up to modern German specifications, but the work was abandoned, and from 7 October 1939 she was scrapped at Linz.

**Pioneer Boats** Between the wars, the Austrian Bundesheer Pioneer Corps operated a flotilla of small motorboats. When these were armed they carried 8mm Schwarzlose MG. The 33-ton boat Gazelle was armed with a 20mm cannon in addition to the MG. 14-ton Schleppboot (tug) The 14-ton boats were named, in order of building, Krems, Drau, Mur, Traun, Salzach, Enns and Inn. Launched: April 1930 (Krems) – January 1937 (Inn), by Zeugsanstalt Krems. Dimensions: Displ: 14 tons; L: 14.4m/47ft 3in; B: 3m/9ft 10in; D: 0.80m/2ft 7½in. Power/

Speed:Twin screws; diesel engines, total 200bhp/17 knots.Guns/Armour:3 × 8mm Schwarzlose MG.Barsch in Austrian service between April 1920 and July 1929. (Drawing courtesy of Erwin Sieche)Birago as in 1935 after being purchased from Hungary. Note the folding mainmast and the telescoping armoured crow's nest. (Drawing courtesy of Erwin Sieche)14-ton Schlepboot. (Drawing by Erwin Sieche)The design built as Gazelle. (Drawing by Erwin Sieche)2cm Tankgewehr M 35. (Photo from Marine- und Flußkriegseinheiten by Erwin Steinböck)33-ton Schlepboot (tug) GazelleLaunched:1934 by Mittlere Schiffsteil.Dimensions:Displ: 32.8 tons; L: 21m/68ft 11in; B: 3.85m/12ft 7½in; D: 0.80m/2ft 7½in.Power/Speed:Twin screws; 2 × diesel engines, total 320bhp/11.8 knots.Guns/Armour:1 × 20mm M 35 cannon; 2 × 8mm Schwarzlose MG.1935 Kampfboot DesignsIn 1935 designs were drawn up for combat boats armed with cannon. Two types were envisaged, the 5-ton type with a 20mm cannon, and the 9-ton type with a 47mm Böhler anti-tank gun. In the event neither type would be built.1945–2006After the end of the Second World War, the Austrian government planned to build a flotilla of nine patrol boats to help secure the Danube as an international waterway. In fact only two boats were built, the small Oberst Brecht and the larger Niederösterreich.5-ton Kampfboot.9-ton Kampfboot. (Drawings by Erwin Sieche)The crew of Niederösterreich saluting a visiting Soviet squadron, Vienna, April 1985. (Photo courtesy of Erwin Sieche)Oberst BrechtLaunched:1958 by Korneuburg Werft, No A601. Steel hull.Dimensions:Displ: 10 tons; L: 12.3m/40ft 4in; B: 2.51m/8ft 2in; D: 0.75m/2ft 5½in.Crew:6.Power/Speed:Twin screws; 2 × Graf & Stift diesel engines, total 290bhp/14 knots.Guns/Armour:1 × 84mm Carl Gustav recoilless anti-tank rifle; 1 × 0.50 cal Browning HMG.Fate:Stricken July 2006. Retained as museum exhibit.NiederösterreichLaunched:1970 by Korneuburg Werft, No A604. Steel hull.Dimensions:Displ: 73 tons; L: 29.67m/97ft 4in; B: 5.41m/17ft 7in; D: 1.1m/3ft 7in.Crew:9.Power/Speed:Twin screws; 2 × MWM diesel engines, total 1,620hp/22 knots.Guns/Armour:1 × 20mm Oerlikon Mark 66 cannon; 1 × 84mm Carl Gustav recoilless anti-tank rifle; 1 × 0.50 cal Browning HMG; 2 × 7.62mm MG/Bulletproof bridge/wheel-house.Fate:Stricken July 2006. Retained as museum exhibit.The Patrouillenbootstaffel was operated by the Army Pioneers up until 31 July 2006. Apart from the high diesel consumption of Niederösterreich during a time of severe budgetary restrictions, it was realised that both patrol boats were vulnerable to tank fire from the banks, and to aircraft, especially while negotiating the many locks of the post-war Danube, which has been dammed at several points to install electricity-generating stations. With their retirement, the long history of the Austrian riverine forces was brought to a close.Oberst Brecht dazzle-painted. For a colour view, see Appendix 2.Oberst Brecht. (Drawing by Erwin Sieche)Niederösterreich. (Drawing by Erwin Sieche)AUSTRIA-HUNGARYIt is all too easy to dismiss the Austro-Hungarian Empire for its role in starting the First World War and its calamitous collapse at the end of that conflict. Apart from major contributions to art, music, ballet and architecture up to and during the Belle Époque, a visit to the entrance hall of the Vienna Army Museum will reveal the statues of the numerous Austrian marshals and generals who for centuries defended Central Europe against the expansion of the Ottoman Empire.In the nineteenth and early twentieth centuries, Austrians

were at the forefront of technical innovation. Robert Whitehead's first successful automotive torpedo was developed for the Austrian Navy. Dr Porsche's petrol-electric Landwehrzug all-wheel-drive artillery train was a sensation in 1912, the oceanographic exploration submersible Loligo was launched at Rijeka in 1913, and giant Škoda siege howitzers helped crush fortifications across Europe in 1914. At sea the Austro-Hungarian Navy were the first to launch dreadnoughts armed with triple turrets. On the Danube, for centuries the Austrians, then the Austro-Hungarian Dual Monarchy and Empire, had maintained extensive flotillas of sail and oar-powered gunboats, blocking the river to Turkish encroachment. On Lake Garda, an Austrian flotilla had secured control of the lake during the Second and Third Wars of Italian Independence. The Austrians were the first to build modern armoured river gunboats of what would become the classic model, inspired by the USS Monitor. In fact their designs were so successful that one of the very first, the Leitha, has been fully restored to virtually her condition of 1873 as a museum ship, and at the time of writing at least one other example, the hulk of the Bodrog, still exists in Serbia, awaiting restoration in her turn. The introduction of the Maros class inspired the Germans to produce the Rhein and Mosel, and the existence of the Austro-Hungarian monitors almost certainly influenced the later Russian river monitor classes. Developments would include high-angle howitzers carried to fire over high river banks and nearby hills and into trench systems, controlled from armoured crows' nests on telescoping masts. To pass under the Danube bridges, the masts would hinge at the base to fold flat. Later vessels had elaborate lattice masts which also telescoped and folded down. As rivers are relatively easy to blockade with mines, the Austro-Hungarian vessels could be fitted with complex mine rakes on the bows. Despite this, two of the monitors would fall victim to mines during the First World War. Once again, Austro-Hungarian technical skills would bring the lost vessels back into service relatively quickly. The two 'Danube Dreadnoughts', laid down but never completed, would have been tough opponents for all other river gunboats of the era. Projects for two even larger vessels were drawn up, but the design skills of the engineers were undermined by the collapse of the Empire during the Great War, and the later vessels would never be begun. To support the river monitors the Austrians also built a series of armoured river patrol boats, of which several would be deleted before and during the war. The initial classes of small vessels were adequate for patrol and policing duties, but were too vulnerable to modern artillery fire. However, the last 120-ton design was extremely successful and long-lived. This class would form the inspiration for the Czechoslovak President Masaryk. With the collapse of the Dual Monarchy in November 1918, most of the river monitors and patrol boats were divided up between various countries in the revised Europe of the post-war period. Their later developments can be traced under the individual country chapters. The European Danube Commission took over three of the oldest monitors, Leitha, Maros and Szamos, which were disarmed to be used as pontoons, and thanks to this Leitha was saved to be fully restored as a museum ship. Acknowledgements: All photos and plans in this chapter, apart from those taken from the official archives or marked otherwise, are courtesy of Erwin Sieche, many coming from



his personal collection. LAGOON GUNBOATS Analogous to river gunboats are many of the lake gunboats, such as those described in the following section, but the Austrian Navy also ordered special gunboats designed to operate withing the lagoon surrounding Venice. They were side-wheel paddle steamers, with the hull cut away at the stern to allow a clear field of fire for the large muzzle-loading guns. From the following photos and plan it is clear that they would not be able to operate on the open sea. They preceded the RN Rendel 'Flatiron' coast defence gunboats by some twelve years. By comparison the Rendel types were generally much larger, with the gun firing forward and aimed by manoeuvring the ship, as it could elevate but not traverse. The twin-screw Rendels could cross open stretches of water by lowering the gun by means of a hydraulic mechanism, which lowered the centre of gravity of the ship and improved stability. However, whenever a Rendel was required to voyage any distance from its base, for example to carry out shore bombardment, it would usually be towed by a larger vessel. The two vessels on the left and the third of the same type in the centre background are Austrian lagoon gunboats Nos II, III and VI seen at Venice between 1855 and 1866. A rear view of lagoon gunboat No I at Venice between 1855 and 1866. At this time the armament was a 48-pounder muzzle-loader. Note the extreme cutaway stern section to allow the large gun to traverse. Lagoon gunboat profile. (Drawing courtesy of Karl Klaus Körner) Six lagoon gunboats were built, and when Venetia was ceded to Italy in October 1866 they were sold to the Italian Navy for 20,000 florins. The Austrians could very well have evacuated them along with the naval base contents and the rest of the fleet, but these gunboats were so specialised that they were probably thought unfit for any other duty, and in any case they would probably have had to be dismantled for sea transport. Then just five years later the Austrians decided to start building monitors for the Danube. For the lagoon gunboats' later configuration, see ITALY. Launched: 1855, by J Ruston, Vienna/Florisdorf. Sent in parts to Venice and reassembled by Guidecca. Dimensions: Displ: 75 tons; L: 30.5m/100ft; B: 5.18m/17ft; D: 0.9m/2ft 11in. Crew: 29-32. Power/Speed: Side paddle wheels; steam engine, 25 nominal hp/8 knots. Guns/Armour: 1 x 48-pounder iron SB; 1 x 7-pounder bronze SB howitzer Model 1842. Fate: Sold to Italy October 1866. LAKE GARDA FLOTILLA A little-known aspect of the Austrian Navy was its presence on Lake Garda during the wars of Italian unification. In June 1859 the Hess and Franz Joseph, plus the Benaco, took part in the Second War of Italian Independence. The Benaco was lost on 20 June when she was sunk by a Piedmontese field gun battery at Salo. The lack of any French and Piedmontese naval units meant that the Austrians had complete dominance of the Lake. During the Third War of Italian Independence which began in June 1866, the Hess and Franz Joseph with six modern screw-driven gunboats – Wildfang, Raufbold, Wespe, Uskoke, Scharfschütze and Speiteufel – faced the five Italian gunboats supplied by France plus two Italian-built steamers Solferino and Saint Martino, along with Benaco, which the Austrians recaptured on 19 July in Gargano. With the end of the war, Lake Garda was ceded to Italy, except for a small strip of shoreline around Riva del Garda. The Austrian flotilla was dissolved and the vessels were sold to their former enemies for the sum of one million florins. Gunboat Franz Joseph on Lake Garda. When sold to

Italy she was renamed San Marco, and was used as a passenger steamer. (Photo from Ogliari, Francesco: *La navigazione sui laghi italiani – Lago di Garda*, Milan : Cavallotti, 1987)

**Hess** Launched: As Hess May 1852, by Escher Wyss, Zurich, assembled by Riva del Garda shipyard. Wooden hull. Dimensions: Displ: 360 tons; L: 45.4m/149ft; B: 5.5m/18ft; D: 1.5m/4ft 11in. Crew: 55. Power/Speed: Side paddle wheels; steam engine, 100ihp; brigantine rig. Guns/Armour: 2 × 18-pounder MLR; 2 × 7-pounder bronze SB howitzers Model 1842. In Italian service as gunboat: 2 × 12-pounder MLR; 1 × 3-pounder howitzer. Fate: Sold to Italy 2 December 1866 as Prince Oddone. Passenger steamer 1867. Scrapped 1890.

**YANGTZE EXPEDITION** The Austro-Hungarian Navy were participants in the exploration of China's rivers. In 1890–1 the iron corvette SMS Zrinyi (launched 10 December 1870 by the Stabilimento Tecnico Triestino), explored the Yangtze River as far upstream as Nanking (Nanjing) and Hankow. Her crew sketched and mapped the river banks and took especial notice of the fortifications on both banks. Their work was useful during the fighting in the Boxer Uprising a decade later.

**Ex-Austrian Hess as Italian Prince Oddone.** (Painting by D Cavarrone, in the Genoa Naval Museum)

**RIVER MONITORS** All the Austro-Hungarian river monitors were named after tributaries of the Danube. Maros and Leitha

Although the American armoured vessels derived from the original Monitor were far from safe on the open seas, they performed well enough in the confines of river systems, where their low freeboard made for a small target, and their cylindrical Coles-style turret allowed for virtually all-round fire from just two guns. Following the Crimean War, Turkey ordered five armoured gunboats of the Feth-ül-Islam class from France, and their appearance on the lower Danube from 1865 onward spurred the Austrians into responding. It was decided to build two armoured monitor-style gunboats, to be designed by the experienced K.u.K. Naval Architect-Inspector Josef Ritter von Romako. He would produce a design inspired by the USS Monitor type but incorporating several innovations. The most obvious new feature was the downward curve of the armoured deck at the bow and stern. This arrangement reduced the weights at both ends and contributed to the shallow draught of the vessels. Interestingly, in Britain Yarrow would be taking the opposite view as regards the stern of their river vessels, building a flat, wide stern to spread the weight. Yarrow's version did, however, require placing the screws in tunnels which Romako avoided, the hull being cut away aft for the screws. Previous steam engines were slow-turning low-pressure types, usually employing a single large horizontal cylinder. For his new river monitors, Romako fitted a pair of 2-cylinder vertical engines turning at relatively high speed. This allowed him to use smaller propellers, essential given the vessels' shallow draught. The riveted hulls were made of iron which in the case of Leitha has lasted for almost a century and a half. For the first time Bessemer steel was used for the armour, a 25mm layer being placed directly on the deck, and 44mm of vertical hull armour was fixed to 203mm of teak backing. The turret and conning tower had 50mm armour. In 1871, to protect against attacks by spar torpedoes, and particularly in view of the recent Austrian adoption of Whitehead's locomotive torpedo, thought was given to providing the monitors with a comprehensive anti-torpedo net protection, which would be hung at a distance from the hull on

booms hinged vertically at the deck edge. Such an arrangement would have added substantial weight on a hull where shallow draught was essential, and the danger of part of the net coming adrift after battle damage or by snagging on a river obstacle, and entangling the screws or the rudder, meant it was quickly forgotten. For the later anti-mine protection, see below. Profile of the Maros class as originally built in 1871. Note the conning tower built on top of the turret, as used on many early monitor designs. This arrangement was copied by the Germans on Rhein and Mosel. Not shown are the two spars mounted one each side of the bows for spar torpedoes, copying contemporary Turkish river monitors which used spar torpedoes at bow and stern as defence against enemy spar torpedo boats. There was originally no foremast, just a large flagpole on the conning tower. The structures on the foredeck are WC boxes (the 'heads'). The galley is the box with a chimney in front of the funnel. An early modification was the addition of a spark-arrestor on the funnel, to avoid starting forest fires on the banks of narrow waterways. This was soon removed and would not be copied on subsequent designs. During the 1873 refit the flagpole on the conning tower was removed and replaced by a foremast in front of the WC boxes. Another innovative feature was the addition of flushing toilets, in the boxes on the deck forward, which were among the very first of their kind on-board ship. They have been faithfully reproduced on the reconstructed Leitha, as later repositioned on either side behind the funnel. Laid down in 1870 at Pest Flumaner Schiffbau AG in Budapest, both monitors were accepted into service in 1872. They first went into action during the Austro-Hungarian occupation of Bosnia-Herzegovina in September 1878, when they provided fire support to troops on the banks of the River Sava. Modern replicas of the two 15cm System Wahrendorf breech-loading guns originally mounted in each of the Coles-type turrets on Maros and Leitha in 1871. The turret crew numbered sixteen men, and a further ten ammunition handlers worked in the magazine below the turret, handing up charges. The guns used separate loading of shell and silk propellant bag, and could achieve a rate of fire of between four and six rounds a minute. The turret was rotated by hand, and for large degrees of training the whole ship was turned towards the target. (Photographed inside the replica turret on the reconstructed Leitha). Specifications as built 1870–1 Launched: Maros: April 1871; Leitha: May 1871, by Pest Flumaner Schiffbau AG, Budapest. Dimensions: Displ: 310 tons; L: 49.98m/164ft; B: 8.12m/26ft 7in; D: 1.07m/3ft 6in. Crew: 50. Power/Speed: Twin screws; 2 × 350ihp 2-cyl vertical steam engines/8.3 knots. Guns/ Armour: 2 × 15cm L/21 Wahrendorf BL; + from 1878: 2 × 25mm Palmkrantz manually-operated HMG/Deck 25mm (Maros), 19mm (Leitha); Hull 44mm on 203mm teak backing; Turret 51mm front, 44mm sides and rear; Conning tower 64mm. Fate: Rebuilt 1893–4. The original pair of monitors had been in service for over twenty years, and in reserve for several more, when it was decided to build a new pair, which would become the Körös and Szamos. At the same time as they were building, the improvements incorporated in the new pair were incorporated in the Maros and Leitha, giving them a new lease of life, and providing the Danube Flotilla with a quartet of monitors sharing common armament and similar performance. Their old engines were replaced by a pair of vertical triple expansion engines of greater power, raising their maximum

speed to match that of the new monitors. The old twin turret and Warendorf guns were removed, and replaced by a new cylindrical turret mounting a single Škoda 12cm L/35 gun, the same as in the newer monitors. A new bulletproof citadel was installed, and a new oval-shaped conning tower was fitted behind the turret, with an 8mm Salvator-Dormus MG in a shield mounted on top. On each side of the funnel, the old 25mm Palmkrantz MG were replaced by a pair of 47mm Hotchkiss revolver cannons with a cyclic rate of fire of forty rounds a minute, providing a much improved defence against torpedo boats. During the Great War this armament would be further modified, as shown in the following drawings: Leitha would receive a 7cm L/42 gun in a large shielded mounting at the stern, a short-barrelled 7cm L/18 gun would be mounted to the rear of the superstructure, and two tall cylindrical MG turrets would be installed, each armed with an 8mm Schwarzlose.25mm Palmkrantz four-barrelled manually-operated MG. In 1881 it was proposed to fit two mountings, one behind the pair of WC boxes on the forward deck, and one near the stern. These mountings were given more command by placing them on either side of the funnel on a platform deck, supported by the boxes for the heads which were moved from the foredeck to either side behind the funnel. The complete gun weighed 300kg, and the magazine held a total of thirty-two rounds, eight for each barrel. The cyclic rate of fire was over ninety rounds a minute. Maros would be rearmed with a total of three 7cm L/18 guns, all in shielded mounts, two of which replaced the 47mm Hotchkiss. The rebuilt Maros on the Danube in about 1900. At that time she was armed with a single modern Škoda 12cm L/35 turret gun, a pair of 47mm Hotchkiss revolver cannons mounted port and starboard behind the funnel, in place of the 25mm Palmkrantz, and a shielded 8mm Salvator-Dormus Model 1893 MG on top of the new conning tower. Two spars were carried on board, as mooring poles (Schorbaum) to distance the vessel from a sloping riverbank. Maros as rebuilt 1893–4, with a central superstructure and modern armament. The drawing shows her with the three 7cm L/18 guns fitted as secondary armament during the Great War. One has replaced the 8mm MG on the conning tower, and the rear pair are situated on top of the repositioned WC boxes, and replace the earlier Palmkrantz MG and Hotchkiss revolver cannons. (Drawing by Erwin Sieche) The replacement turret fitted to Maros and Leitha mounting a single 12cm L/35 Škoda gun. Two identical turrets and Škoda guns were also fitted to Szamos. As the conflict progressed both monitors would also carry a pair of 37mm Pom-Poms to subdue small-arms fire from the river banks. With the planned introduction of Monitors VII and VIII in 1914, both Maros and Leitha were due to be deleted. However, with the imminent outbreak of war both were retained, and the old ships saw considerable action. At first part of the Sava River monitor group based at Breko, they provided fire support to the Austro-Hungarian army. In late September 1914, on forcing the entry to the Sava River, Leitha received a hit on her turret: the gun crew were killed and the guns put out of action. She was repaired at the Slavonic-Mitroviča yard. Then in October 1915 they joined the other monitors in the attack on the Serb capital of Belgrade, fighting duels with Serb and Allied artillery. Between December 1915 and August 1916 both monitors remained at Ruschuk. Then Leitha shelled Romanian oil and harbour installations at Giurgiou. Meanwhile,

Maros guarded the Belene Channel. From the winter of 1916 up until the end of the war both ships were based on the river between Budapest and Orsova. In 1919 Leitha was renamed Lajta in Hungarian service, and fought the Czechs and Slovaks, before both monitors were handed over to Yugoslavia. They never entered service, being discarded in 1921. While Maros was scrapped, Leitha was sold into commercial service, and in 1928 became the elevator hulk József Lajo.

Specifications as rebuilt 1894  
Dimensions: Displ: 310 tons; L: 49.98m/164ft; B: 8.12m/26ft 7in; D: 1.07m/3ft 6in. Crew: 57. Power/Speed: Twin screws; 2 × 600ihp 2-cyl VTE steam engines/10 knots. Guns/Armour: 1 × 12cm L/35; Secondary armament 1897: 2 × 47mm Hotchkiss revolver cannons; 1 × 8mm Salvator-Dormus MG. 1916: Maros: 3 × 7cm L/18; Leitha: 1 × 7cm L/42 + 1 × 7cm L/18 + 2 × 8mm Schwarzlose MG. Later 2 × 37mm Pom-Poms added on open mounts/Turrets 75mm front (3 × 25mm laminates), 50mm sides and rear (2 × 25mm laminates); Hull 44mm on 90mm teak backing; Deck 25mm (Maros), 19mm (Leitha); Conning tower 50mm (2 × 25mm laminates); Superstructure: bulletproof. Fate: Maros scrapped 1921; Lajta disarmed 1921, from 1928 used as elevator hulk; museum ship 2010.

In the 1970s Hungarian naval historian Dr. Károly Csonkaréti discovered the old ship, and with naval enthusiast Dr. András Margitay-Becht worked to try to preserve her. Leitha as rebuilt in 1893–4, with new superstructure and new guns, in a different layout to those on her sister. Again, the drawing shows her Great War configuration of 1915–18. (Drawing by Erwin Sieche)

The 7cm L/42 gun mounted on the stern of the rebuilt Leitha. 7cm L/18 gun. The 37mm Vickers Pom-Pom fitted during the Great War to counter enemy small-arms fire. Salvator-Dormus Model 1893 delayed-blowback machine gun manufactured by Škoda. In view of its lightweight construction, and the curious arrangement whereby the rate of fire was controlled by adjusting the swinging pendulum exposed below the breech, it was rejected by the Army. However, it functioned well enough on fixed mountings in fortresses and on naval vessels. (Photo via Wikipedia)

They had a difficult task, as the ex-Leitha consisted of simply an empty hull, lacking her internal partitions and watertight bulkheads, with no steering or mooring fittings, which prevented her legally from being moved. Her superstructure had gone, and new holes had been cut in the deck. The side armour had long disappeared. Despite all the problems, in 2005 she was hauled up on dry land for preservation, and by 2010 had undergone a complete transformation, restoring her to the state she was in when first commissioned. At the time of writing, Lajta serves as the honorary flagship of the Hungarian Army's river warship regiment.

Szamos and Körös

More than twenty years after the introduction of the Maros and Leitha, it was decided to build a second pair of river monitors for the Danube. Designer Josef Thiel took advantage of the developments since the launch of the original pair, and produced two miniature pre-dreadnoughts with a main gun turret fore and aft of a substantial superstructure, topped with an imposing funnel for forced draft, and numbers of smaller guns. Note that the class still retained the deck profile of Maros and Leitha, curving downwards at bow and stern. For the first time, the screws turned partly in shallow tunnels in the underneath of the hull. A full-scale wooden dummy of the Maros class built in the spring of 1915, intended to draw fire from hidden French and Serb batteries at Belgrade, thus

exposing their positions. Unfortunately, details of the dummy were leaked and the ruse failed. Lajta as reconstructed as a museum ship in 2010 to her configuration in 1873. (Drawing by Dr Balagh Tarras) The armoured conning tower was now circular, and separated from the main superstructure. A second cylindrical tower supported the gun mounting at the rear of the superstructure. Armour was now nickel-steel, increased to 50mm for the belt, backed by 90mm of teak, with 75mm on the turrets, 19mm on the deck, and 40mm on the conning tower. The remainder of the superstructure was built of bulletproof plating. The main guns were 12cm L/35 models, those on Körös being supplied by Krupp, and those on Szamos by Škoda, presumably to compare the two types. Significantly, no more Krupp guns were ordered. Each of the cylindrical structures carried a long 7cm gun, and a tall cylindrical turret amidships mounted an 8mm MG, initially a Salvator-Dormus model, with a second MG carried in the crow's nest. Both would later be replaced by the 8mm Schwarzlose. Körös in pre-war livery. Her main armament guns were built by Krupp, whereas the guns on her sister were built by Škoda. Szamos in wartime livery. Note the semaphore device mounted above the bridge, and the raised forward bulwarks. Also the Škoda 12cm guns are mounted higher in the turret with a smaller embrasure than on Körös. Körös during the First World War. (Drawing by Erwin Sieche) The drawing shows the addition of the spotting top in the form of an armoured crow's nest. In photographs this is seen at different heights above the deck, because the masts were able to telescope to pass under river bridges. For the same reason the funnels hinged rearwards. Prominent at the bow was the now-standard Danube anchor in the form of a four-arm grapnel. As the moored or floating mine posed the greatest risk to these river monitors, an elaborate minesweeping rake structure could be deployed over the bows to catch and explode these deadly weapons. Below decks, Yarrow boilers supplied steam to two vertical triple expansion engines, built by Schichau in Elbing, giving a speed of 10 knots. They were built in 1891–2 by Schönichen & Hartmann at Budapest (Körös was originally to be named Theiss). Both vessels were active during the Great War. Körös engaged Serbian artillery within hours of the declaration of war, taking six direct hits on 4 August 1914. Both vessels participated in the breakthrough into the Save River in late September, and they featured in contemporary illustrations of the bombardment of Belgrade. On 28 August both were attacked unsuccessfully by three Romanian torpedo boats. The following day they shelled oil depots at Giurgiu and shipping in Zimnicea. Körös took part in the operation to destroy the Romanian pontoon bridge at Rjahovo on 2 October 1916, in return taking twelve hits from Romanian artillery and suffering heavy damage. After Russia and Romania had been knocked out of the war, Körös and Szamos participated in the Black Sea cruise to Odessa by Flottenabteilung Wulff, and operated on the River Dnepr. Returning to the Danube, they covered the retreat of the Austro-Hungarian forces, and ended the war at Belene. In 1919 they were taken over by Hungary, and fought against the Czechs and Slovaks. Körös showing her mine rake. The cumbersome device could be lowered to attempt to catch moored and floating mines. Her crow's nest on its telescopic mast has been lowered. Both vessels were withdrawn from service in 1921, Szamos becoming crane pontoon FK 202, and Körös was handed over to the

Yugoslavs. For her subsequent service, see YUGOSLAVIA. Launched: 1892 by Schönichen & Hartmann, Budapest. Dimensions: Displ: 448 tons; L: 54m/162ft 9in; B: 9m/25ft 9in; D: 1.2m/5ft 3in. Crew: 77. Power/Speed: Twin screws; 2 × 600ihp 3-cyl VTE steam engines/10 knots. Guns/ Armour: 2 × 12cm L/35; 2 × 7cm L/42 QF; 2 × 8mm MG/Turrets 75mm front (3 × 25mm laminates), 50mm sides and rear (2 × 25mm laminates); Hull 40mm + 10mm on 90mm teak backing; Bulkheads 50mm; Deck 19mm; Conning tower 50mm. Fate: Körös to Yugoslavia as Morava; Szamos crane pontoon FK 202. Körös crewmen displaying pieces of a Romanian torpedo recovered after the unsuccessful attack on their monitor on 28 August 1914. Körös on an unknown date, having the Krupp gun in her aft turret removed/replaced, by the expedient of mooring under a railway (?) bridge. Note her 7cm L/42 on the stern which normally is mounted in the gun tub where the officer is standing, and her armoured crow's nest lowered. Both of the gun turrets on Körös were armed with Krupp 12cm L/35 C/89 guns on Krupp mountings. Note that because the gun pivots further back on the mounting, the embrasure is much larger than on the turrets with Škoda 12cm L/35 guns, as on her sister Szamos (and the rebuilt Maros and Leitha). The barrel is also set lower in the embrasure, which makes it easy to distinguish between the two sister-ships.

Temes (I) and Bodrog

Following the decision in the 1890s to build a pair of new monitors every ten years, the Temes class were constructed by the Danubius Schönichen-Hartmann AG Yard in Budapest, and launched in 1904. In this class the sloped deck arrangement of the previous four vessels was replaced by a more classic horizontal deck line. In order to double the ahead firepower, always an advantage in narrow river environments, Josef Thiel designed the class with the narrow 'tadpole'-shaped main turrets, the circular armoured conning tower being placed between them. Astern firepower was relegated to a single 12cm short-barrelled howitzer behind a minimal shield. The shield was later extended to give the gunners more protection. The great advantage of the howitzer was its ability to fire over high river banks, intervening hills, and into trenches, observed and corrected from the tall armoured crow's nest on the mast. The crew of Temes (I) coaling ship from a lighter. Note her name on the lifebelt, her twin wheels on the bridge, and an MG under a tarpaulin on the bridge wing.

Temes (I) as in 1904. Note the mast can be pivoted down on the battery deck and the funnel can hinge rearwards to clear bridges. In her original configuration Temes (I) could always be told apart from her sister Bodrog by her two large ventilator cowls at the rear of the battery deck. (Drawing by Erwin Sieche)

The two turrets of Bodrog with the shielded 7cm L/18 gun above, photographed at Odessa. Note the slatted optical signalling device behind the gun shield, used to send messages in Morse. Above the bridge is a gun tub with an 8mm MG.

The Škoda 12cm L/35 turrets fitted to Temes (I) and Bodrog. Note the severely restricted interior space. The 12cm L/10 howitzer mounted on the stern of both vessels, with its small shield.

Bodrog fired the first shots of the Great War even before the official start of hostilities, capturing three Serbian boats at Zemun on 26 July 1914. Temes (I) was flagship of the Danube Flotilla from 1908 to 1914. She was an early victim of a Serbian mine, sinking on 23 October 1914 with thirty-one men killed and ten wounded. She was salvaged and rebuilt with two high-angle 9cm L/45 anti-balloon gun

mountings replacing her single 12cm howitzer. Bodrog participated in the destruction of the pontoon bridge at Rjahovo on 2 October 1916. In April 1918 both monitors crossed the Black Sea to Odessa as part of Flottenabteilung Wulff. Retreating towards Budapest at the end of the war, on 31 October 1918 Bodrog grounded on a sandbank downstream from Belgrade, and was captured by Serb forces. In April 1920 Temes (I) was passed to Romania as the Ardeal. For her subsequent service, see ROMANIA. Bodrog was passed to Yugoslavia as the Sava. For her subsequent service, see YUGOSLAVIA. The wreck of Temes (I), sunk after hitting a Serb mine in the Sava River on 23 October 1914. Thirty-one crewmen lost their lives. The heavy loss of life and the extent of the damage confirms that she suffered a partial magazine explosion when the mine detonated in the region of the starboard 12cm turret. She was repaired in Budapest, and returned to service with a modernised secondary armament.

4.7cm L/44 QF. Launched: Temes (I) 26 March 1904, Bodrog 12 April 1904, by Danubius Schönichen-Hartmann AG, Budapest. Dimensions: Displ: 440 tons; L: 56.2m/184ft 5in; B: 9.50m/31ft 2in; D: 1.2m/3ft 11in. Temes (I) rebuilt: Displ: 440 tons; L: 58.6m/192ft 3in; B: 9.56m/31ft 4in; D: 1.5m/4ft 11in. Crew: 86. Power/Speed: Twin screws; 2 × 700ihp 3-cyl VTE steam engines/17.8 knots. Temes (I) rebuilt: 16.9 knots. Guns/Armour: 2 × 12cm L/35; 1 × 12cm L/10 howitzer; 2 × 37mm Hotchkiss revolver cannon, replaced 1913/1914 by 2 × 47mm L/44 QF; 1 × 8mm MG/Turrets 75mm front, 50mm sides, 40mm rear; Hull 40mm + 10mm on 90mm teak backing; Deck 19mm; Conning tower 50mm. Bodrog 1915: 2 × 47mm replaced by 1 × 7cm L/18 QF; MG increased to 2. Temes (I) 1917: 2 × 12cm L/35; 2 × 9cm L/45; 2 × 8mm MG. Fate: Bodrog to Yugoslavia; Temes (I) to Romania. The gunners manning the 12cm howitzer on the stern of Bodrog. Note how cramped the cupola is. (Photo courtesy of ) One of the two 47mm L/44 QF guns on the battery deck of Bodrog. Note the very short recoil, indicated by the polished part of the barrel. (Photo courtesy of ) Temes (I) firing her new 9cm guns. From the assembled guests on the left, including at least one lady, this may be her recommissioning ceremony. Temes (I) as re-commissioned on 23 April 1917. The drawing shows her reduced forward superstructure, and the 12cm howitzer aft replaced by two new 9cm guns with AA capability. She had been lengthened by 2.40m (7ft 10½in). Note the funnel hinging arrangement to pass under low bridges. (Drawing by Erwin Sieche) 9cm L/45 anti-balloon gun at full elevation. The mounting had a range of -3° to +90°. The fitting of two of these modern weapons gave the rebuilt Temes a powerful anti-aircraft capability for the time. Inn and Enns A hundred tons larger than the preceding class, Inn and Enns carried a powerful armament. For the first time the main guns were mounted in a twin turret, which saved weight compared with the two single turrets on Temes and Bodrog. The single howitzer for high-angle fire was replaced by three of the same calibre, mounted in between-deck cupolas which gave all-round armour protection to the gunners, albeit at the expense of internal space. The anti-balloon function was fulfilled by two 47mm L/50 guns on the superstructure. The telescoping mast carrying an armoured crow's nest was now standardised. This had three sections which retracted one inside the other, following which the retracted mast could be folded down to lie flat to clear bridges. The funnel was also much lower than on the previous classes, for the same



reason. Enns with folding pole masts in place of the lattice mast carried by her sister Inn. The class has the two-gun forward fire capability of Temes (I) and Bodrog, now mounted for the first time in a twin turret, with longer guns. Indirect fire capability was greatly increased by replacing the single shielded 12cm L/10 howitzer at the stern with three such weapons, mounted in armoured cupolas, countersunk into the rear deck. The tertiary armament now comprised two 47mm L/50 DP guns in large shields, mounted on the superstructure. (Drawing by Erwin Sieche) Enns completed in October 1914, and she soon undertook her first artillery duel with Serbian gunners defending Belgrade. She twice attacked the Flaminia pontoon bridge, then wintered on the Lower Danube at the close of 1917. Taken over in October 1918 by Hungary as the Drava, she was finally handed over to Yugoslavia as the Drava: for her subsequent service, see YUGOSLAVIA. Her sister-ship was completed in April 1915. On 22 September 1917 Inn struck one of five Serbian mines near Braila, and sank in 7m of water in five minutes. The Danube Flotilla's Chief of Staff, Korvettenkapitän von Förster, and one warrant officer were killed, and eight crewmen were injured. Salvaged between two barges in December 1917, she was repaired at Budapest and lengthened by 2.4m (7ft 10½in) by adding a block between ribs 15 and 19. In April 1919 she became the Hungarian Ujvidek, then under the Communist regime of Bela Kun she was renamed Marx. Finally, she was ceded to Romania as the Basarabia. For her subsequent service, see ROMANIA. Launched: 29 July 1914 (Enns) by Stabilimento Tecnico Triestino Werft, Linz; 25 February 1915 (Inn) by Ganz & Co, Budapest. Dimensions: Displ: 536 tons; L: 60.2m/197ft 6in; B: 10.5m/34ft 5in; D: 1.3m/4ft 3in. Inn rebuilt: Displ: Approx. 700 tons full load; L: 62.6m/205ft 5in; B: 10.5m/34ft 5in; D: 1.3m/4ft 3in. Crew: 86. Power/Speed: Twin screws; 2 × 750ihp (Inn rebuilt: 2 × 780ihp) oil-fired 3-cyl VTE steam engines/17.8 knots Guns/Armour: 2 × 12cm L/45; 3 × 12cm L/10 howitzers; 2 × 47mm L/50 QF; 6 to 8 × 8mm MG/Turrets 75mm front, 50mm sides, 40mm rear; Hull 40mm + 10mm on 90mm teak backing; Deck 25mm; Conning tower 50mm front, 40mm rear, 2 × 10mm plates roof. Fate: Enns to Yugoslavia; Inn to Romania. Inn with telescopic foremast and armoured crow's nest. This type of mast was first tested on the Maros class. It telescoped downwards in three sections. As it was offset to starboard, the telescoped mast could be folded backwards to lie alongside the funnel. Inn sunk in 7m of water. She struck a mine 14km (almost 9 miles) downriver from Braila on 22 September 1917. Three men were killed, two seriously injured and six suffered minor injuries. Salvage work on Inn began in October 1917. She arrived in Budapest for repairs in February 1918, and her bows were lengthened by 2.4m (7ft 10½in). Note her two 47mm L/50 DP mounts on the rear of the battery deck. The large shield has been removed from the mount on the left, and both barrels are missing, presumably to lighten the wreck. Also visible is her rear conning tower. Enns seen after suffering damage during the bombardment of Belgrade on 8 October 1915. She was hit below the waterline by a 138mm shell fired by the French battery on Topcider Hill. Here her pumps are in action to keep her afloat, and she safely reached Budapest for repairs. Twin 12cm L/45 gun turret. The French 138mm shell which fortunately did not explode. The 12cm magazine was flooded. Single 12cm L/10 howitzer in armoured cupola. Enns and Inn carried three of these

cupolas on the rear deck, countersunk into the deck plating, providing a powerful indirect fire capability. Sava and Temes (II) (later renamed Bosna) Sava and Temes (II) followed the lines of Inn and Enns. It was originally planned to mount a second twin 12cm L/45 turret at the stern, but wartime shortages meant that the same three-cupola arrangement as on Enns and Inn was finally fitted. The rearmost of the three cupolas exchanged the short-barrelled howitzer for a pair of 7cm (actually 66mm) L/26 anti-balloon guns with +90° elevation. In September 1918 Sava entered a Romanian drydock in Galata, but with the general collapse in November she was withdrawn to Budapest. Given the Hungarian name Soca in January 1919, in April 1920 she was handed over to Romania as the Bucovina: for her subsequent service, see ROMANIA. When the original Temes was salvaged and rebuilt, in May 1917 Temes (II) was renamed Bosna. She was one of the monitors in Flottenabteilung Wulff, crossing the Black Sea to Odessa and operating on the Dnepr. In January 1919 she was handed over to Yugoslavia as the Vardar. For her subsequent service, see YUGOSLAVIA. Sava moored beside the walls of the fortress of Smederevo, built in 1428. Her lattice mainmast has been retracted. This mast proved too top-heavy, so finally Sava was rebuilt with a pole mainmast. Sava as built, with her telescopic mast, which folded forward once retracted. (Drawing by Erwin Sieche) Launched: 31 May 1915 (Sava), 20 June 1915 (Temes II) by Stabilimento Tecnico Triestino Werft, Linz. Dimensions: Displ: 600 tons; L: 61m/200ft 2in; B: 10.5m/34ft 5in; D: 1.3m/4ft 3in. Crew: 86. Power/Speed: Twin screws; 2 × 800ihp oil-fired 3-cyl VTE steam engines/17.8 knots. Guns/Armour: 1 × twin 12cm L/45; 2 × 12cm L/10 howitzers; 1 × twin 7cm L/26 QF; 2 × 47mm L/50 DP guns; 6 × 8mm MG/Turrets 75mm front, 50mm sides, 40mm rear; Hull 40mm + 10mm on 90mm teak backing; Deck 25mm (2 × 12.5mm laminates); Conning tower 50mm front, 40mm rear, 45mm roof. Fate: Bosna to Yugoslavia; Sava to Romania. Bosna. Her masts pivoted to be able to pass under bridges. Note the three MG turrets on each side of the bridge. Temes (II), renamed as Bosna, without a telescopic mainmast. (Drawing by Erwin Sieche) A pair of Škoda 66mm L/26 guns (twin mounting number 266, probably from a Wels class patrol boat). These guns were formerly on display at the Budapest Military Museum. (Photographed on 18 May 1986 by Erwin Sieche) The twin 66mm stern mounting with +90° elevation. The photo shows the cupola on Temes (II). (Photo from Website ) Monitors XI and XII These powerful vessels were designed to replace the original Maros and Leitha. Voted in the 1916 Budget, they were laid down at the Linz shipyard, but the chaotic state of the Empire and material shortages meant that they were never completed. Monitors XI and XII were broken up on the slips shortly after the end of the war. If they had entered service they would have proved to be formidable river combat ships. Their two large turret guns would have been useful for shore bombardment, and their secondary armament of no less than five 9cm DP guns could have fended off Allied air attacks of the later war period. For the first time, the monitor design included a double bottom, as an increased insurance against mines and grounding damage. Also, the anti-mine and torpedo bulkhead protection, added to their greatly increased size and beam, would have enhanced their survivability – except, perhaps, in the case of a strike in the region of one of the wing turret

magazines, as had occurred with Temes. The British 'Insect' class had been designed to out-gun the existing Danube monitors in the early years of the war. They would have had great difficulty opposing Monitors XI and XII. Laid down at Stabilimento Tecnico Triestino Werft, Linz. Dimensions: Displ: 1,265 tons; L: 76m/249ft 4in; B: 13m/42ft 8in; D: 2m/6ft 7in. Power/Speed: Twin screws. Guns/Armour: 2 × 19cm L/35; 2 × twin and 1 × single 9cm L/45 anti-balloon guns; 2 × 47mm L/33 QF; 4 × 8mm MG/Hull 75mm; Anti-mine and torpedo bulkheads 20mm; Deck 30mm slopes, 17mm flat; Double bottom. Fate: Never completed; scrapped after the war. The proposed appearance of Monitors XI and XII if they had been completed. As they were designated 'Ersatz Maros' and 'Ersatz Leitha' it is possible they would have taken up the names of the very first monitors when these were withdrawn. (Drawing by Erwin Sieche) Single 19cm L/35 turret. Profile and plan of the Škoda design of a twin 9cm L/45 turret proposed as secondary armament for Monitors XI and XII. The fifth gun of this calibre was to have been mounted in a shield on the rear superstructure, similar to those on the rebuilt Temes. A future monitor project proposed in 1915 by Engineers Silvius Morin and F Cossutta of Stabilimento Tecnico Triestino. (Drawing by Erwin Sieche) Monitor Design Projects This long shallow-draught vessel was intended to mount two Škoda 30.5cm L/12 siege howitzers, of the type used since 1914 to batter fortifications from the Western Front to Poland. The huge howitzers, each weighing more than 20 tons, fired a HE shell weighing 287kg at a rate of ten shells an hour, to a range of 12,300m (13,500 yards). The latest model, to be mounted in the monitor, in hooded barbets, was the M 16 with longer L/12 barrel and 360° traverse. Interestingly, in 1918 a Škoda howitzer, the larger 38cm L/17 model, was test-fired on the old coast defence ship SMS Budapest in place of the forward turret. It proved unsuccessful due to the ship continuing to roll with the recoil of firing, making for poor accuracy with subsequent shots. There is no reason to believe that the river monitor design would have been any more successful had the vessel been constructed. Proposed secondary armament was to be two of the powerful 7cm L/50 guns in DP mountings. Dimensions: Displ: 800 tons; L: 68m/223ft 1in; B: 11m/36ft 1in; D: 1.5m/4ft 11in. Guns/Armour: 2 × 30.5cm L/12 howitzers; 2 × 7cm L/50 anti-balloon guns; 4 × 8mm MG/Barbets 40mm; Hull 60mm to 30mm; Deck 30mm; Conning tower 50mm front, 40mm rear. Fate: Never begun, project only. (Drawing by Erwin Sieche) On 11 December 1917, Engineer Silvius Morin proposed a super river monitor model displacing 2,000 tons. Suitable single-gun 24cm L/40 turrets were available on the pre-dreadnought coast-defence ship SMS Budapest, and the old armoured cruiser SMS Kaiser Karl VI. Once again, the state of the Empire at this late stage of the war precluded laying down any such large river monitor. Dimensions: Displ: 2,000 tons; L: 80m/262ft 5in; B: 15m/49ft 3in; D: 2m/6ft 7in. Guns/Armour: 2 × 24cm L/40; 4 × twin 9cm L/45 anti-balloon guns. Fate: Never begun, project only. Škoda 7cm L/50 gun on the LA mounting, planned for the secondary armament. The most powerful of the 7cm weapons, its shell case was the long 66x575 R. The giant Škoda 30.5cm L/12 siege howitzer planned for the 1915 monitor. (Tacom 35th scale model publicity shot) RIVER PATROL BOAT Patrouillenboot a Armed with an 8mm Salvator-Dormus MG and two spar torpedoes, and fitted with a funnel cowl. She could

conceivably have carried a pair of launch cradles for 14in Whitehead torpedoes, but they would have greatly increased her draught and reduced the stability of this small craft. Launched: 1894 by Schichau, Elbing. Dimensions: Displ: 33 tons; L: 22m/72ft 2in; B: 3.5m/11ft 6in; D: 1.1m/3ft 7in. Power/Speed: Single screw; 2-cyl compound steam engine. Guns/Armour: 1 × 8mm Salvator-Dormus Model 1893 MG; 2 × spar torpedoes/Bulletproof conning tower. Patrouillenboot a. (Drawing by László Benczúr) Patrouillenboot b As Patrouillenboot a had not met expectations, a larger PB was ordered from Danubius, powered by internal combustion engines rather than steam. In company with the monitors Temes and Körös and the minesweeper Andor, Patrouillenboot b broke through the Serbian mine barrage and entered the Sava River under heavy shellfire, on 28 September 1914. Patrouillenboot b was paid off in 1915. Launched: 1906 by Danubius Schönichen- Hartmann, Budapest. Dimensions: Displ: 36.5 tons; L: 28m/91ft 10in; B: 4.4m/14ft 5in; D: 0.4m/1ft 4in. Power/Speed: Twin screws; 4-cyl internal combustion engines. Guns/Armour: 1 × 37mm Hotchkiss Model 1885 QF; 2 × 8mm Salvator-Dormus Model 1893 MG/Bulletproof conning tower, MG turrets and crow's nest. Fate: Stricken 23 August 1915. Patrouillenboot b. (Drawing by László Benczúr) With the local beauties perhaps expecting a cruise on the river. Patrouillenboot c and d Patrouillenboot c was scuttled at Pancsova on 9 September 1914. Patrouillenboot d was sunk by Serb artillery at Belgrade on 15 May 1915, showing the vulnerability of these small craft to artillery fire. Launched: 1909 by private yard, Lustenau, Bodensee. Dimensions: Displ: 39 tons; L: 30m/98ft 5in; B: 4.4m/14ft 5in; D: 0.7m/1ft 4in. Power/Speed: Twin screws; 4-cyl internal combustion engine. Guns/Armour: 1 × 8mm Salvator-Dormus Model 1893 MG/Bulletproof conning tower, MG turret and crow's nest. Fate: c scuttled 9 September 1914; d sunk 15 May 1915. Patrouillenboot c and d. (Drawing by László Benczúr) Patrouillenboot c. Patrouillenboot e and f Patrouillenboot f was renamed Stör (I) in December 1916. She was transferred to the Adriatic Lagoon Flotilla 'Acquaeduct' in mid-March 1917, and served there as PM 1 (Panzer Motorboot = Armoured Motor Boat). There is no note of her ultimate fate but it is probable she was taken over by the Italians in 1920. Launched: 1908–9 by Yarrow, Glasgow. Dimensions: Displ: 12 tons; L: 18m/59ft; B: 2.7m/8ft 10in; D: 0.4m/1ft 4in. Power/Speed: Triple screws; 5 × petrol engines. Guns/Armour: Both: 1 × 8mm MG; Stör: + 1 × 37mm Hotchkiss Model 1885 QF/Bulletproof shield protecting the wheel and crow's nest; Stör: MG turret. Fate: e sold 1913; f as Stör (I) to Italians 1920? Stör (I). Right: Patrouillenboot g and h. (Drawings by László Benczúr) Patrouillenboot e, showing the distinctive lines of the Yarrow motor boat, and the stern flap to prevent the boat from sitting down at speed. Ordered in 1908/1909 from the yard in Glasgow, the high operating costs led to her being sold to a private buyer in 1913. Patrouillenboot g and h Yarrow-type Patrouillenboot g was built by Danubius in 1909. She was scuttled at Pancsova on 10 September 1914. Her sister Patrouillenboot h was renamed Lachs in December 1916 and transferred with Patrouillenboot f to the Adriatic Lagoon Flotilla 'Acquaeduct' in mid-March 1917, where she served as PM 2. Once again, her ultimate fate is not known, but as with PM 1 she probably became Italian in 1920. Launched: 1909 by Danubius, Budapest. Dimensions: Displ: 12 tons; L: 18m/59ft; B: 2.7m/8ft 10in; D: 0.4m/1ft 4in. Power/

Speed: Triple screws; 5 × petrol engines. Guns/Armour: 1 × 37mm Hotchkiss Model 1885 QF; 2 × 8mm MG/Bulletproof shield protecting the wheel; armoured conning tower, MG turret and crew's nest. Fate: g scuttled 10 September 1914; h as Lachs to Italians 1920? Patrouillenboot h. 60-ton Patrouillenboot The Navy budget of 1914/15 allocated funds for two 60-ton and four 120-ton patrol boats. The smaller 60-ton boats i and k were built within a year at the DDSG shipyard at Budapest which had had no work on private orders since the outbreak of the war. Before the vessels were launched it was decided to name the patrol vessels after fish found in the Danube. 60-ton Patrouillenboot. (Drawing by Erwin Sieche) Fogas ('Pike-perch'). Note the scale provided by the crewmen, otherwise these 'miniature destroyers' are hard to size from a plan alone. Here she shows off her two Danube-type anchors. Csuka ('pike'). The armoured shelter in front of the mainmast protects the auxiliary steering position. The forward mast and crew's nest can telescope downwards and the rear mast pivots between brackets, to pass under bridges. Patrouillenboot i was commissioned in December 1915, and in 1916 took the name Fogas (Hungarian for 'pike-perch'). In April 1920 she was transferred to the Austrian Army's Pioneer Corps, under her original name. For her subsequent service, see AUSTRIA Post-1918. Patrouillenboot k was commissioned in March 1916 as Csuka (Hungarian for 'pike'). In 1920 she was ceded to Hungary, under the name Siófok. For her subsequent service, see HUNGARY. Launched: Late 1915 (Fogas), early 1916 (Csuka), by DDSG Shipyard, Budapest. Dimensions: Displ: 60 tons; L: 36m/118ft 1in; B: 4.6m/15ft 1in; D: 0.9m/2ft 11in. Crew: 27. Power/Speed: Twin screws; 2 × 400ihp VTE steam engines/12 knots. Guns/Armour: 1 × 66mm L/30 K.09; 2 × 8mm MG/Hull 5mm; Deck 4mm; Turret 5mm; Conning tower 5mm. Fate: Fogas transferred to Austria 15 April 1920; Csuka ceded to Hungary 1920. 120-ton Class The larger 120-ton boats, l, m, n, and o, were built within one year by Ganz & Co. Danubius Maschinen- Waggon- und Schiffbau A.G., Budapest and commissioned on 14 March, 28 March and 28 April 1916 respectively. They were allocated the following fish names: l became Wels ('Cat-fish'), m became Barsch ('Perch'), n became Compó ('Tench') and o Viza ('Sterlet'). In December 1918, Wels and Barsch were interned at Beograd, and in January 1919 the Yugoslavs briefly commissioned them as Bregalnica and Neretva respectively. However, with the redistribution of the ex-Austro-Hungarian vessels, on 15 April 1920 Wels and Viza were allocated to Hungary as Szeged and Kecskemét respectively. In addition, Compó, which had been allocated to Austria, was never re-commissioned, and was later sold to Hungary and renamed Győr. For their subsequent service, see HUNGARY. At the same time in 1920 Barsch was allocated to Austria and re-commissioned under her original name. For her subsequent service, see AUSTRIA Post-1918. Launched: Late 1915 and early 1916, by Ganz & Danubius, Budapest. Dimensions: Displ: 129 tons (133 tons full load); L: 44m/144ft 4in; B: 6m/19ft 8in; D: 1m/3ft 3in. Crew: 27. Power/Speed: Twin screws; 2 × 600shp AEG geared steam turbines/15 knots (up to 18.5 knots on trials). Guns/Armour: 2 × twin 66mm L/26; 4 × 8mm MG/Hull 8mm; Deck 6mm; Turret 5mm; Conning tower 5mm. Fate: Transferred as above details. Three more 120-ton boats were ordered from Ganz & Co. Danubius but were not completed until 1918. They were

larger, with a dual-purpose armament. Boats p and q were named Stör (II) ('sturgeon') and Lachs (II) ('salmon'). Patrouillenboot r was launched in 1918 but never commissioned and was broken up in Hungary. In January 1919 Stör and Lachs were commissioned by Hungary as Komárom and Pozsony respectively, but in 1920 Stör was officially allocated to Austria and re-commissioned under her original name. For Pozsony, see HUNGARY; for Stör, see AUSTRIA Post-1918.120-ton class. (Drawing by László Benczúr) Launched: 1918 by Ganz & Danubius, Budapest. Dimensions: Displ: 129 tons (140 tons full load); L: 45.5m/149ft 3in; B: 6m/19ft 8in; D: 1m/3ft 3in. Crew: 42. Power/Speed: Twin screws; 2 × 700shp AEG geared steam turbines/16 knots. Guns/Armour: Stör and Lachs: 2 × 75mm L/30 K 16 DP guns; 6 × 8mm MG. Patrouillenboot r: 2 × 9cm L/45 DP guns; 6 × 8mm MG/Hull 10mm; Deck 6mm; Turret 5mm; conning tower 10mm. Fate: Stör to Austria; Lachs to Hungary; r broken up after the war. Compó (Hungarian for 'Tench'). Once more, in the absence of crewmen in a photo to give an idea of scale, one could easily mistake these river patrol gunboats for small destroyers. The twin 66mm L/26 gun mounting which armed the four patrol boats of the Wels class. Although still compact, they were somewhat more spacious than the sternmost cupola on Bosna and Sava. (Drawing by László Benczúr) The new dual-purpose single turret designed for 'p' and 'q', armed with a 7.5cm L/30 Škoda gun. Stör (II). (Drawing by László Benczúr) (Plans of Linz courtesy of Erwin Sieche) Linz In 1914 and 1915, an armoured motor boat, Linz, operated on the Lakes and River Flotilla, armed with a 7cm L/42 and three MGs. Also, for the FMK armed riverboats, see GERMANY, Danube. ARMED STEAMERS With such a large expanse of the Danube and its tributaries to patrol, it was only to be expected that the purpose-built monitors and patrol boats should be backed by an extensive flotilla of requisitioned and armed river steamers. The vessels included the Artur, Balaton, Dunajec, Goplana, Kopernic, Krakow, Kraus, Krystina, Kujawiak, Melsztyn, Nadwislanin, Neptun, Planeta, Polonez, Przyjacieli Publici, Pulawy, Samson, Steinkeller, Tyniec, Una, Wanda, Wawel (A), Wawel (B) and Wenera. Many of these can be found on the Website of . On the right is the ex-DDSG steamer Una (227 tons; length 54m/177ft). She survives at the time of writing as the Zupa, and is awaiting restoration at Belgrade. On the left is Inn with the telescopic lattice mast lowered. Ex-DDSG steamer Samson, fitted out as a river gunboat (467 tons; length 62m/203ft 5in). Note how her deck curves downward at bow and stern similar to the arrangement pioneered on Maros and Leitha, and for the same reasons. From the drawing she is armed with two 7cm L/42 on the upper deck and two 7cm L/18 at bow and stern, no doubt supplemented by several 8mm Schwarzlose MG. (Drawing by László Benczúr) The following are a selection of photos and plans: Samson. Tied up alongside is the Russian Danube submarine S-3, captured at Reni on 3 March 1918. Balaton, another steamer with curved deck line (displacement 225 tons, length 55m/180ft 5in), armed with two 7cm L/42 plus a 8mm Schwarzlose MG on the upper deck and two 7cm L/18, at bow and stern. (Drawing by László Benczúr) Bascka and Bája These two small river tugs, 80 tons displacement and 21.5m (70ft 6in) long, were quite well-armed for their size, and the wheelhouse was armoured. Note the funnel is able to pivot rearwards to pass under bridges, and it also acts as a mast for

radio aerials. Bascka was sunk by a mine in July 1919. (Drawing by László BenczúrBája, showing her forward 7cm L/18 Škoda QF cannon. Behind the shield on the wheelhouse roof is an 8mm MG, probably a Salvator-Dormus Model 1893.

### VISTULA FLOTILLA

The Austro-Hungarian Navy had planned the formation of a Vistula Flotilla as early as 1889, with the paddle steamers Wawel and Krakow. In 1897 they commissioned the paddle tug Krystina, the passenger steamer Dunajec and the two small paddle steamers Wilga and Iskra. In 1910 the Zieleniewsky Works in Krakau launched the Melsztyn, Wanda, Kopernik and Tyniec. With the Balkan crisis of 1912, in November of that year the river steamers began to be armed: Wawel received four 37mm Hotchkiss and two 8mm MG, Wanda, Melsztyn and Kopernik two 37mm and two 8mm MG, and Dunajec and Tyniec received just a pair of 8mm MG each. In addition, steps were taken to add bulletproof protection: 8mm around the machinery spaces, and 5mm on the deck and conning tower. Other steamers added up to thirty sandbags plus two MG on tripods.

The Vistula Flotilla was put on a war footing on 30 July 1914, to protect Austro-Hungarian shipping from Russian attacks, operating from bases in Austrian Galicia. In addition to the Austro-Hungarian vessels, the German Volunteer Motorboat Corps, or FMK, was sent to the Vistula by the German Army. For details, see GERMANY. After the Russian Army had been expelled from Poland, in 1915 the Flotilla extended its zone of operations further to the North, escorting tugs and barges carrying supplies for Austro-Hungarian and German forces operating to the east of the River. In March 1916 the Flotilla was increased by the arrival of seven armed motorboats: Alpha, Gamma, Dora, Ida, Cb der Enns, Hedwig and Gott mit uns. Their numbers were swelled by the inclusion of two captured Serbian vessels Save and Danubius.

### Wawel

Profile of Wawel. (Drawn by Herbert Winkler, in *Marine - Gestern, Heute*, 1975 Vol 2)

### Krystina

Krystina, with white hull and buff upperworks, with her funnel and mast folded down to pass under the bridge on which the photographer is standing. (Photo from Website )

The armament fitted on the stern of Krystina: two 37mm Model 1885 single-barrelled Hotchkiss Model 1885 QF guns, with an 8mm Schwarzlose MG mounted between them, giving formidable firepower to such a small vessel. (Photo courtesy of )

Profile of Krystina, powered by a 150ihp steam engine, and drawing 0.65m/2ft 1½in. Armed with four 37mm Hotchkiss QF and two 8mm MG. (Drawn by Herbert Winkler, in *Marine - Gestern, Heute*, 1975 Vol 2)

### Dunajec

Dunajec seen from a bridge. She appears here to be armed with two 37mm Hotchkiss Model 1885 QF. (Photo courtesy of )

### Melsztyn, Wanda and Kopernik

Launched: 1910 by Zieleniewsky Works in Krakau.

Dimensions: Displ: 510 tons; L: 38m/124ft 8in; B: 4.7m/15ft 5in; 8.8m/28ft 10½in over paddleboxes; D: 0.54m/1ft 9in.

Power/Speed: Side paddle wheels; Steam engines 108ihp.

Guns/ Armour: 2 × 37mm Hotchkiss Model 1885 QF; 2 × 8mm MG/Machinery spaces 8mm; Deck and Conning tower 5mm.

The double-enders built for the K.u.K. in 1910. Note their sloping deck profile and the rudders fore and aft. (Drawn by Herbert Winkler, in *Marine - Gestern, Heute*, 1975 Vol 2)

### Nadwislanin

Profile of Nadwislanin, powered by a 120ihp steam engine, and drawing 0.50m/1ft 7¾in. Armed with two 37mm Hotchkiss QF and two 8mm MG. (Drawn by Herbert Winkler, in *Marine - Gestern, Heute*, 1975 Vol 2)

### Polonez

(100ihp, draught 0.70m/2ft 3½in),

Goplana (50ihp, draught 0.75m/2ft 9½in) and Neptun (60ihp, draught 0.55m/1ft 9½in).**POSTSCRIPT**During the last days of the First World War all surviving floating and operable units of the K.u.K. Donauflotte returned to their base barracks at Óbuda, a suburb of Budapest. There, on 6 November 1918, they were ceremonially paid off. The vessels were disarmed under the supervision of the Allied Control Commissions which operated in both Austria and Hungary. Thus ended a century-old branch of the Austro-Hungarian armed forces. On the eightieth anniversary, 6 November 1998, to celebrate their proud heritage, the Hungarians held a commemorative ceremony in front of the former Barracks of the Donauflotte. During the ceremony two commemorative plaques were unveiled.**BELGIUM**Belgian explorers and administrators in Central Africa were among the first users of the classic Yarrow type of stern-wheeler. On the lower Congo River the Belgian Force Publique maintained an armed steamer, the *Hirondelle*, with a 6-pounder (57mm) Nordenfelt gun. With the outbreak of the Great War other river steamers were armed.**CONFRONTATIONS ON THE SANGHA RIVER**On 3 August 1914, the German community of Kinshasa, together with several hundred Congolese recruits, set out on board the steamer *Dongo* to reach the German colony of Eastern Kamerun. Their intention was to link up with German Schutztruppen on the River Sangha, and then return to occupy Kinshasa and Brazzaville. However, French troops based in Brazzaville armed the steamer *Albert Dolisie* and set off in pursuit. Just three days later the *Dongo* was captured, and German plans thwarted. The following month the French in Brazzaville asked for Belgian aid in neutralising the remaining German positions on the River Sangha. The Belgians armed a new paddle steamer, the *PS Luxembourg*, with one 3-pounder Nordenfelt QF gun and two 7.65mm machine guns. She sailed with a force of sixty Congolese troops, returning to Kinshasa with wounded men in early November, then finally led a force of six ships up the Sangha. German resistance was overcome just before Christmas.**LAKE TANGANYIKA**On Lake Tanganyika in 1914 the Belgians had a 90-ton 22.5m (73ft 9in) steamer, the *Alexandre Delcommune*, and were building a large vessel, the *Baron Dhanis*, of 700 tons. Both were capable of being armed as gunboats if necessary. On 6 August 1914 the *Delcommune* had been allowed to leave the German port of Kigoma due to confusion on the part of the German authorities as to whether the Belgian Congo would remain neutral. The Germans aboard the newly-armed *Hedwig von Wissmann* spotted the *Delcommune* on 25 August, but the Belgian steamer was able to use her superior speed to escape. However, the Germans followed her to Mtoa and shelled her, forcing the *Delcommune's* crew to beach her. She was again attacked on the night of 8/9 October, this time by a force which landed and placed explosive charges, causing slight damage. Finally on 23 October she was shelled once more by the *Hedwig*, by this time towing a pair of 8.8cm guns, and after receiving some thirty hits was severely damaged. The *Delcommune* would be repaired and armed, with a 12-pounder gun, under the new and appropriate name of *Vengeur Alexandre Delcommune* in her original pre-war form, with two funnels. *Baron Dhanis* after the war. *Alexandre Delcommune* after being rebuilt, with presumably at least a new or repaired boiler, with now just one funnel. She is armed with a 12-pounder gun, so here she is now known as



Vengeur. Mosselback ('Dix-Tonnes') Stung into responding, the Belgians sent by rail to the lake a 10-ton armoured motor launch, 14m (45ft 11in) long. Renamed the Mosselback, she was manned by one officer and six men. Mosselback was armed with 47mm (3-pounder) and 57mm (6-pounder) Nordenfelt guns, but these severely overloaded her, and the Belgians had to remove some armour plating and reinforce her structure, reducing her designed speed. In July 1915 observers on shore noted the approach of the German Kingani, and the Mosselback sortied to engage her. Outgunned, the Kingani retreated, and the Belgian launch was not fast enough to catch her. Mosselback, originally known as the 'Dix-Tonnes', armed with a 47mm and a 57mm gun. Note the Netta in the background. (Photo Belgian Army Museum)

Netta RIVER GUNBOATS RIVER GUNBOATS RIVER GUNBOATS Austro-Hungarian Monitors Szamos (foreground) and Leitha (background) as they appeared during the First World War. (Photo courtesy of Erwin Sieche) Austro-Hungarian Monitors Szamos (foreground) and Leitha (background) as they appeared during the First World War. (Photo courtesy of Erwin Sieche) Austro-Hungarian Monitors Szamos (foreground) and Leitha (background) as they appeared during the First World War. (Photo courtesy of Erwin Sieche)

RIVER GUNBOATS SAN ILLUSTRATED ENCYCLOPAEDIA ROGER BRANFILL-COOK RIVER GUNBOATS SAN ILLUSTRATED ENCYCLOPAEDIA ROGER BRANFILL-COOK

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CONTENTS Introduction Notes on the Plans and Specifications Acknowledgements Country Chapters The earliest British river gunboats were officially owned by the Honourable East India Company. However, they operated

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Acre Angola Argentina Austria post-1918 Austria-Hungary Belgium Bolivia Brazil Bulgaria Burma/ Myanmar Cambodia Cameroon China Colombia Confederate States of America Congo, Democratic Republic Croatia, Independent State 1941–1945 Czechoslovakia Egypt Equatorial Guinea Estonia Finland France Germany Great Britain Guinea Hungary Iraq Italy Japan Malawi Manchukuo Mozambique Nigeria Paraguay Peru Poland Portugal Romania Russia Serbia South Africa South Vietnam 1955–1975 Spain Sudan (Mahdist State) Sweden Switzerland Thailand Turkey Uganda Ukraine United States of America Uruguay Uzbekistan Vietnam Yugoslavia Bibliography Appendix 1: River and Lake Gunboats in Popular Culture Appendix 2: River Gunboat Camouflage Schemes CONTENTS Introduction Notes on the Plans and Specifications Acknowledgements Country Chapters

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INTRODUCTION Inspiration Like many of my generation, my own interest in river gunboats began with Robert Wise's masterful film interpretation of *The Sand Pebbles* in 1966. Who could forget Steve McQueen's 'Hello Engine', or the desperate fight at the barrage of junks, when Richard Crenna's Captain Collins tries to redeem his small gunboat's honour? The same year came the depiction of General Gordon in Khartoum, with the mystery of what happened to his gunboat *Abbas*, despatched to fetch help. The reissue on DVD of the classic *Korda 1939*

colour movie *The Four Feathers* reminded us that Kitchener's old gunboat *Melik* was still with us. I was two years old when John Huston filmed *The African Queen*, but I came to know and love it when the classic movie was screened on British TV nearly every Christmas holiday. Thus began my fascination with the lake gunboats of Africa. Defining the Scope of this Encyclopaedia

Mounting a cannon on any small oared craft capable of carrying it immediately transformed it into a 'gunboat'. The size of the Danube meant that some river gunboats employed there were in fact small sailing warships. The restrictions of most rivers, however, ruled out the use of sail power, and the size and weight of cannons increased to the point where oar power also became impractical. The use of the classic river gunboat came into its own in the nineteenth century with the introduction of the steam engine, and this work concentrates on gunboats powered by steam or internal combustion engines, to the exclusion of purely oar or sail power. Now the smaller gunboats could penetrate deep inland, moving upriver against strong currents, attempting the independent passage of rapids in narrow gorges which had previously defied sailing or oared vessels and required, in appropriate cases, assistance by rope haulage from the banks. With the advent of steam power, the gunboat became the smallest type of warship able to project naval power, whether used to protect harbours and coastlines – such as the 'flatiron' type used by the Royal Navy – or for patrol and policing duties, or simply as a 'presence' in far-flung parts of the world. The term 'gunboat diplomacy' came into being to recognise the influence these small vessels could bring to bear. Ocean-going gunboats with relatively deep draft were in fact used to penetrate quite far up major rivers. Their use continued into the First World War period in Mesopotamia, and up to the Second World War on the lower stretches of the Yangtze and other Chinese rivers, where the opposing Japanese and Chinese navies deployed large vessels including destroyers and cruisers. In the case of ocean-going sloops and gunboats, I have provided representative examples of the types of vessel involved. The American Civil War saw the first large-scale use of steam-powered gunboats on the North American river systems. The scope of the conflict also introduced the widespread conversion of commercial riverine craft to warships. For the sake of completeness, this encyclopaedia includes ACW riverine vessels nominally designated as 'rams' if they also carried gun armament, especially behind armour. A contemporary use of armoured river gunboats occurred in China during the bloody civil war which pitted the Taiping rebels against the Emperor, when Gordon set up his headquarters on board the side-wheel paddle steamer *Hyson*. With the advent of iron construction, the Royal Navy pioneered the technique of constructing a sectionalised gunboat in a British yard, for transport abroad and reassembly at the chosen destination. The prototype was *HMS Mohawk* of 1843, a side-wheel paddle steamer built to patrol Lake Erie. She was closely followed by her American counterpart *USS Michigan*. In France Napoleon III proposed and oversaw the production of drawings for sectionalised river gunboats to use on rivers and lakes during his Italian campaign of 1859. Subsequently, the French built large numbers of such craft for river warfare in Indochina and elsewhere. The British continued the trend with two Peruvian gunboats intended for use on Lake Titicaca, which were

designed in 1862. The extremely difficult transport of their hundreds of individual parts on the backs of mules – and the carrying of their sectional propeller shafts on the backs of porters – up the slopes of the Andes, however, meant that the first vessel did not in fact enter service until 1870. The gunboats on Lake Titicaca were examples of the ‘pin-built’ form of construction, whereby the vessels consisted of hundreds of individual pieces, small enough to be man- or mule-ported over considerable distances. Before leaving the builder’s shipyard, the individual hull and deck plates would be trial-assembled to the ribs by bolts. They would then be disassembled, numbered and carefully packed into cases for transport overseas. On arrival on site, the hundreds of parts would be permanently assembled using rivets. The process involved sending skilled supervisors to accompany the kit of parts, and to oversee the work of reassembly by local workmen. On more than one occasion, the design plans would not arrive on site with the kit of parts, providing a major headache for the supervisor. One of the last military usages of ‘pin-built’ vessels was the overland transportation of the German steamer Graf von Götzen to Lake Tanganyika in 1915, but steamers intended for service on Lake Victoria were transported in thousands of pieces up to modern times. The other form of this type of vessel was the ‘knock-down’ construction, whereby the hull and superstructure would be pre-assembled in complete sections. Once again, following initial assembly with bolts, they would be dismantled for overseas transport, often on the decks or in the holds of cargo ships. The relatively large size of each section compared with the small parts of the ‘pin-built’ version meant that they had to be carried on railway or road wagons, or even floated down rivers. In the case of the hull sections, this form of construction often continued to use bolts to hold the sections together. In period photos, the numbers marked on adjacent sections can be clearly seen. Napoleon III’s floating riverine batteries were of this type, as were many Nile and China gunboats. In the 1880s the firm of Yarrow, based at Poplar on the Thames, began to specialise in shallow-draft vessels which revolutionised the exploration and colonisation of vast stretches of Africa. Tested on the Thames, they would then be broken down into sections, for shipping and overland transport to the ultimate destination, where they would be bolted together. This system also avoided the problem of deploying a shallow-draft vessel to distant stations when she was completely unsuitable for long ocean transits. Again, the smaller gunboats used in Mesopotamia during the First World War were also broken down for transit. Larger British gunboats, such as the ‘Insect’ class, would affect long transits suitably lightened and reinforced for the open sea. However, as the French would learn with the Argus, encountering bad weather could mean serious trouble. Yarrow’s first type of shallow-draft vessels used stern wheel propulsion, as was common on American rivers. This avoided the complication of burying propellers in tunnels which in certain areas risked being clogged with weeds. Several of the country chapters illustrate variants of his steamers, which featured the classic ‘locomotive’ boilers, familiar to early railway enthusiasts. His next important contribution to shallow-draft river craft was the invention of the hinged flap arrangement to ensure the efficiency of screw propellers inside tunnels. The perfection of smaller breech-loading guns, and also reliable machine guns, meant that riverine craft in Africa and

Indochina could quickly be converted to gunboats, by bolting down armament ranging from a single Gardner or Nordenfelt manually-operated machine gun, then the fully-automatic Maxim which supplanted them, to small-calibre quick-firing cannon originally designed as anti-torpedo boat armament on larger vessels. The smallest of these was the short single-barrelled 37mm 1-pounder Hotchkiss Model 1885, then in ascending calibre the 47mm 3-pounder, and the 57mm 6-pounder. The more powerful riverine craft would go on to mount the classic 76mm 12-pounder. Some gunboats would even mount 6in guns or larger. This volume describes several vessels which were known to their contemporaries as 'riverine battleships'. At short ranges, considerable firepower could be laid down by the fearsome French five-barrelled 37mm Hotchkiss revolver cannon, capable of pumping out up to forty high-explosive or shrapnel rounds a minute, or by the popular Maxim 37mm Pom-Pom. The modern day equivalents are the chain gun and the Minigun. A relatively heavy armament was always valuable, when for example following rivers where even famous explorers such as Mungo Park came to grief at the hands of aggressive natives. Or when attempting to prevent tribes from invading their neighbours' territory in search of slaves, such as on the Gambia and Niger. Missionaries also tended to ensure their steamers were capable of carrying artillery or machine guns: one leading missionary had been killed and eaten by cannibals, and Arab slavers inevitably resisted Christian do-gooders interfering with their lucrative business. Conversely, if a gunboat was likely to face enemy troops dug in along the river bank, then the classic First World War antidote to trenches was fitted, in the form of short-barrelled howitzers or even army mortars. The rapid and simple conversion of commercial riverine craft to gunboats which began during the American Civil War continued into the First World War period, especially on the vast river systems of Russia. The large numbers of such craft, and their often ephemeral existence – at least as warships – means that I have refrained from attempting the virtually impossible task of listing each and every river craft armed with a cannon or machine gun, but instead have provided examples to give some idea of the types of craft involved. In many cases, specific details of these transitory craft have either been lost, or in fact were never recorded. At the very least, I have attempted to find a photo. But in one notable case, the Hyson used in China by Gordon, to date no illustration has come to light. Also included are gunboats used on lakes, as they were in most respects identical to the types found on river systems, and I have extended the scope to also take in the fascinating 'lagoon gunboats' designed to protect Venice. Maps My original intention was to include colour maps of all the various river systems and lakes where historical and current gunboats were and are used. As my research revealed the enormous scope of my project, and bearing in mind the practicalities of publishing and distributing the finished work, I have preferred to give the space over to the descriptions of all the river and lake gunboats I have found, rather than dedicate many dozens of pages to maps which are freely accessible elsewhere. Reference libraries can furnish historical and modern atlases, and a search on the Internet will quickly pinpoint any particular place or water course mentioned in the text. A particularly valuable resource is the David Rumsey Historical Map Collection. The Sources Previous authors and historians have concentrated on

certain narrow aspects of river gunboats. In the United States, the river gunboats of the Civil War have received much attention. China gunboats on the Yangtze and other smaller rivers are now relatively well-covered in literature. The centenary of the Great War and the turbulence in Iraq revived interest in the Mesopotamia campaigns, and many contemporary reminiscences were revisited. Austrian and Hungarian authors have covered their respective navies on the Danube, but lack of translation into English has hampered their widespread dissemination. A similar problem has bedevilled the sharing of the significant research conducted by Russian historians and enthusiasts. A rich source of information has, as always, been the Internet. I freely recognise the contributions of the many enthusiasts, and I give them credit for their input, which so often has such a limited shelf life before it disappears forever behind the 'Error 404' message, the bane of the surfer's life. A large part of the Bibliography is dedicated to the Websites which provided much valuable information. One site in particular must be mentioned, the vast Narypedia site run by Ivan Gogin, which includes many river gunboats. In the herculean task of compiling his vast encyclopaedia, which attempts to eventually list all the warships from the industrial revolution up to today, in a very few places he has copied inaccurate information, which I have corrected in my own work. Some countries defy all reasonable attempts to find full information. The main country affected is China. Whereas the multitude of foreign China gunboats have always received international attention, conversely the details of historic Chinese China gunboats are fragmentary, for the reasons discussed in the relevant country chapter. Over-protective state secrecy does not help the situation with regard to modern Chinese river gunboats. Conversely the Royal Navy never hid its first iron-armoured battleships from view, but flaunted them in full view of their possible French opponents. Hiding them from view could have given the impression that, just perhaps, they had good reason to hide. So little attention has been paid to the subject of river gunboats, that even official sites can lack certain basic details. The most commonly omitted are 'crew complement', 'horsepower' and 'speed'. With their secondary role of transporting troops or police detachments, the complement of a river gunboat could vary depending on the circumstances, from a handful of caretaker crew when not in action to several hundred if space was available. As for speed, high speed is a great advantage on the open sea, and can convey a vital tactical advantage, for example when attempting to out-manoeuvre an enemy formation, or as in the past when launching or avoiding a torpedo or ramming attack. In a riverine environment, the principal requirements are shallow draught and manoeuvrability. Speed is a secondary consideration. It suffices to show a significant surplus speed over the strongest head current to be encountered. In shallow or confined waters high speed is a definite disadvantage. Then there is the psychological aspect. If the object of operating a gunboat is to overawe indigenous peoples living on the river banks, then the bulk of a heavily-armed gunboat moving with slow determination is sufficient. A similar effect is a favourite trick of movie directors, when the camera is deliberately slowed to show a group of heroes 'walking the walk', advancing with determination towards a showdown. Usual riverine maximum speeds ranged from 8 knots to a maximum sprint of 12 to 15 knots. On the other hand, several gunboat crews would discover

to their discomfort that low maximum speed often meant they could never make headway against strong currents . . . This is the first work to attempt to cover the subject as fully as possible at the time of writing. Given the enormous scope it is inevitable there will be gaps and lacunas. My hope is that I will have inspired future historians and enthusiasts to fill these gaps, and recognise the historical contributions of the river or lake gunboat.

Ongoing Developments Just as with my initial intention to provide maps, when the enormous scope of the subject unfolded to me, I was obliged for space considerations to delete one additional planned appendix, detailing the research and building of model gunboats. Readers who wish to browse these elements to complete the picture will find them on my Website, at [http://www.gunboat.org.uk](#), in the relevant pages dedicated to river gunboats. There I will also be posting additional illustrations, and updating new details of river gunboats as they come to light.

Ivoir, September 2017

### INTRODUCTION

Inspiration Like many of my generation, my own interest in river gunboats began with Robert Wise's masterful film interpretation of *The Sand Pebbles* in 1966. Who could forget Steve McQueen's 'Hello Engine', or the desperate fight at the barrage of junks, when Richard Crenna's Captain Collins tries to redeem his small gunboat's honour? The same year came the depiction of General Gordon in Khartoum, with the mystery of what happened to his gunboat *Abbas*, despatched to fetch help. The reissue on DVD of the classic Korda 1939 colour movie *The Four Feathers* reminded us that Kitchener's old gunboat *Melik* was still with us. I was two years old when John Huston filmed *The African Queen*, but I came to know and love it when the classic movie was screened on British TV nearly every Christmas holiday. Thus began my fascination with the lake gunboats of Africa.

### Defining the Scope of this Encyclopaedia

Mounting a cannon on any small oared craft capable of carrying it immediately transformed it into a 'gunboat'. The size of the Danube meant that some river gunboats employed there were in fact small sailing warships. The restrictions of most rivers, however, ruled out the use of sail power, and the size and weight of cannons increased to the point where oar power also became impractical. The use of the classic river gunboat came into its own in the nineteenth century with the introduction of the steam engine, and this work concentrates on gunboats powered by steam or internal combustion engines, to the exclusion of purely oar or sail power. Now the smaller gunboats could penetrate deep inland, moving upriver against strong currents, attempting the independent passage of rapids in narrow gorges which had previously defied sailing or oared vessels and required, in appropriate cases, assistance by rope haulage from the banks. With the advent of steam power, the gunboat became the smallest type of warship able to project naval power, whether used to protect harbours and coastlines – such as the 'flatiron' type used by the Royal Navy – or for patrol and policing duties, or simply as a 'presence' in far-flung parts of the world. The term 'gunboat diplomacy' came into being to recognise the influence these small vessels could bring to bear.

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including destroyers and cruisers. In the case of ocean-going sloops and gunboats, I have provided representative examples of the types of vessel involved. The American Civil War saw the first large-scale use of steam-powered gunboats on the North American river systems. The scope of the conflict also introduced the widespread conversion of commercial riverine craft to warships. For the sake of completeness, this encyclopaedia includes ACW riverine vessels nominally designated as 'rams' if they also carried gun armament, especially behind armour. A contemporary use of armoured river gunboats occurred in China during the bloody civil war which pitted the Taiping rebels against the Emperor, when Gordon set up his headquarters on board the side-wheel paddle steamer Hyson. With the advent of iron construction, the Royal Navy pioneered the technique of constructing a sectionalised gunboat in a British yard, for transport abroad and reassembly at the chosen destination. The prototype was HMS Mohawk of 1843, a side-wheel paddle steamer built to patrol Lake Erie. She was closely followed by her American counterpart USS Michigan. In France Napoleon III proposed and oversaw the production of drawings for sectionalised river gunboats to use on rivers and lakes during his Italian campaign of 1859. Subsequently, the French built large numbers of such craft for river warfare in Indochina and elsewhere. The British continued the trend with two Peruvian gunboats intended for use on Lake Titicaca, which were designed in 1862. The extremely difficult transport of their hundreds of individual parts on the backs of mules – and the carrying of their sectional propeller shafts on the backs of porters – up the slopes of the Andes, however, meant that the first vessel did not in fact enter service until 1870. The gunboats on Lake Titicaca were examples of the 'pin-built' form of construction, whereby the vessels consisted of hundreds of individual pieces, small enough to be man- or mule-ported over considerable distances. Before leaving the builder's shipyard, the individual hull and deck plates would be trial-assembled to the ribs by bolts. They would then be disassembled, numbered and carefully packed into cases for transport overseas. On arrival on site, the hundreds of parts would be permanently assembled using rivets. The process involved sending skilled supervisors to accompany the kit of parts, and to oversee the work of reassembly by local workmen. On more than one occasion, the design plans would not arrive on site with the kit of parts, providing a major headache for the supervisor. One of the last military usages of 'pin-built' vessels was the overland transportation of the German steamer Graf von Götzen to Lake Tanganyika in 1915, but steamers intended for service on Lake Victoria were transported in thousands of pieces up to modern times. The other form of this type of vessel was the 'knock-down' construction, whereby the hull and superstructure would be pre-assembled in complete sections. Once again, following initial assembly with bolts, they would be dismantled for overseas transport, often on the decks or in the holds of cargo ships. The relatively large size of each section compared with the small parts of the 'pin-built' version meant that they had to be carried on railway or road wagons, or even floated down rivers. In the case of the hull sections, this form of construction often continued to use bolts to hold the sections together. In period photos, the numbers marked on adjacent sections can be clearly seen. Napoleon III's floating riverine batteries were of this type, as were



many Nile and China gunboats. In the 1880s the firm of Yarrow, based at Poplar on the Thames, began to specialise in shallow-draft vessels which revolutionised the exploration and colonisation of vast stretches of Africa. Tested on the Thames, they would then be broken down into sections, for shipping and overland transport to the ultimate destination, where they would be bolted together. This system also avoided the problem of deploying a shallow-draft vessel to distant stations when she was completely unsuitable for long ocean transits. Again, the smaller gunboats used in Mesopotamia during the First World War were also broken down for transit. Larger British gunboats, such as the 'Insect' class, would affect long transits suitably lightened and reinforced for the open sea. However, as the French would learn with the *Argus*, encountering bad weather could mean serious trouble. Yarrow's first type of shallow-draft vessels used stern wheel propulsion, as was common on American rivers. This avoided the complication of burying propellers in tunnels which in certain areas risked being clogged with weeds. Several of the country chapters illustrate variants of his steamers, which featured the classic 'locomotive' boilers, familiar to early railway enthusiasts. His next important contribution to shallow-draft river craft was the invention of the hinged flap arrangement to ensure the efficiency of screw propellers inside tunnels. The perfection of smaller breech-loading guns, and also reliable machine guns, meant that riverine craft in Africa and Indochina could quickly be converted to gunboats, by bolting down armament ranging from a single Gardner or Nordenfelt manually-operated machine gun, then the fully-automatic Maxim which supplanted them, to small-calibre quick-firing cannon originally designed as anti-torpedo boat armament on larger vessels. The smallest of these was the short single-barrelled 37mm 1-pounder Hotchkiss Model 1885, then in ascending calibre the 47mm 3-pounder, and the 57mm 6-pounder. The more powerful riverine craft would go on to mount the classic 76mm 12-pounder. Some gunboats would even mount 6in guns or larger. This volume describes several vessels which were known to their contemporaries as 'riverine battleships'. At short ranges, considerable firepower could be laid down by the fearsome French five-barrelled 37mm Hotchkiss revolver cannon, capable of pumping out up to forty high-explosive or shrapnel rounds a minute, or by the popular Maxim 37mm Pom-Pom. The modern day equivalents are the chain gun and the Minigun. A relatively heavy armament was always valuable, when for example following rivers where even famous explorers such as Mungo Park came to grief at the hands of aggressive natives. Or when attempting to prevent tribes from invading their neighbours' territory in search of slaves, such as on the Gambia and Niger. Missionaries also tended to ensure their steamers were capable of carrying artillery or machine guns: one leading missionary had been killed and eaten by cannibals, and Arab slavers inevitably resisted Christian do-gooders interfering with their lucrative business. Conversely, if a gunboat was likely to face enemy troops dug in along the river bank, then the classic First World War antidote to trenches was fitted, in the form of short-barrelled howitzers or even army mortars. The rapid and simple conversion of commercial riverine craft to gunboats which began during the American Civil War continued into the First World War period, especially on the vast river systems of Russia. The large numbers of such craft, and their often ephemeral existence –

at least as warships – means that I have refrained from attempting the virtually impossible task of listing each and every river craft armed with a cannon or machine gun, but instead have provided examples to give some idea of the types of craft involved. In many cases, specific details of these transitory craft have either been lost, or in fact were never recorded. At the very least, I have attempted to find a photo. But in one notable case, the Hyson used in China by Gordon, to date no illustration has come to light. Also included are gunboats used on lakes, as they were in most respects identical to the types found on river systems, and I have extended the scope to also take in the fascinating ‘lagoon gunboats’ designed to protect Venice. Maps My original intention was to include colour maps of all the various river systems and lakes where historical and current gunboats were and are used. As my research revealed the enormous scope of my project, and bearing in mind the practicalities of publishing and distributing the finished work, I have preferred to give the space over to the descriptions of all the river and lake gunboats I have found, rather than dedicate many dozens of pages to maps which are freely accessible elsewhere. Reference libraries can furnish historical and modern atlases, and a search on the Internet will quickly pinpoint any particular place or water course mentioned in the text. A particularly valuable resource is the David Rumsey Historical Map Collection. The Sources Previous authors and historians have concentrated on certain narrow aspects of river gunboats. In the United States, the river gunboats of the Civil War have received much attention. China gunboats on the Yangtze and other smaller rivers are now relatively well-covered in literature. The centenary of the Great War and the turbulence in Iraq revived interest in the Mesopotamia campaigns, and many contemporary reminiscences were revisited. Austrian and Hungarian authors have covered their respective navies on the Danube, but lack of translation into English has hampered their widespread dissemination. A similar problem has bedevilled the sharing of the significant research conducted by Russian historians and enthusiasts. A rich source of information has, as always, been the Internet. I freely recognise the contributions of the many enthusiasts, and I give them credit for their input, which so often has such a limited shelf life before it disappears forever behind the ‘Error 404’ message, the bane of the surfer’s life. A large part of the Bibliography is dedicated to the Websites which provided much valuable information. One site in particular must be mentioned, the vast Navypedia site run by Ivan Gogin, which includes many river gunboats. In the herculean task of compiling his vast encyclopaedia, which attempts to eventually list all the warships from the industrial revolution up to today, in a very few places he has copied inaccurate information, which I have corrected in my own work. Some countries defy all reasonable attempts to find full information. The main country affected is China. Whereas the multitude of foreign China gunboats have always received international attention, conversely the details of historic Chinese China gunboats are fragmentary, for the reasons discussed in the relevant country chapter. Over-protective state secrecy does not help the situation with regard to modern Chinese river gunboats. Conversely the Royal Navy never hid its first iron-armoured battleships from view, but flaunted them in full view of their possible French opponents. Hiding them from view could have given the impression

that, just perhaps, they had good reason to hide. So little attention has been paid to the subject of river gunboats, that even official sites can lack certain basic details. The most commonly omitted are 'crew complement', 'horsepower' and 'speed'. With their secondary role of transporting troops or police detachments, the complement of a river gunboat could vary depending on the circumstances, from a handful of caretaker crew when not in action to several hundred if space was available. As for speed, high speed is a great advantage on the open sea, and can convey a vital tactical advantage, for example when attempting to out-manoeuvre an enemy formation, or as in the past when launching or avoiding a torpedo or ramming attack. In a riverine environment, the principal requirements are shallow draught and manoeuvrability. Speed is a secondary consideration. It suffices to show a significant surplus speed over the strongest head current to be encountered. In shallow or confined waters high speed is a definite disadvantage. Then there is the psychological aspect. If the object of operating a gunboat is to overawe indigenous peoples living on the river banks, then the bulk of a heavily-armed gunboat moving with slow determination is sufficient. A similar effect is a favourite trick of movie directors, when the camera is deliberately slowed to show a group of heroes 'walking the walk', advancing with determination towards a showdown. Usual riverine maximum speeds ranged from 8 knots to a maximum sprint of 12 to 15 knots. On the other hand, several gunboat crews would discover to their discomfort that low maximum speed often meant they could never make headway against strong currents . . . This is the first work to attempt to cover the subject as fully as possible at the time of writing. Given the enormous scope it is inevitable there will be gaps and lacunas. My hope is that I will have inspired future historians and enthusiasts to fill these gaps, and recognise the historical contributions of the river or lake gunboat.

Ongoing Developments Just as with my initial intention to provide maps, when the enormous scope of the subject unfolded to me, I was obliged for space considerations to delete one additional planned appendix, detailing the research and building of model gunboats. Readers who wish to browse these elements to complete the picture will find them on my Website, at [http://www.rivergunboats.com](#), in the relevant pages dedicated to river gunboats. There I will also be posting additional illustrations, and updating new details of river gunboats as they come to light.

Ivoiry, September 2017

### NOTES ON THE PLANS AND SPECIFICATIONS

With such a varied collection of river and lake gunboats, ranging from sectionalised armed launches to massive riverine ironclads, to keep to a standard scale for the available plans and drawings would be futile. Where space is available the plans have been expanded to fill the page or column width, and virtually all the drawn-on scales have been eliminated. It is a relatively simple matter to reproduce copies of the plans to any desired scale by referring to the specifications. The specifications are as complete as can be found from the various published and Internet references. In some cases details have had to be left blank, for example where the precise dimensions are not all recorded or have been lost. A stunning example of this latter is the displacement for the Lake Baikal icebreaker SS Angara, where the original archive plans in the UK do not specify her tonnage. And neither can the museum which currently preserves her. Length is virtually always overall, which can exceed the water-line

length. In a very few cases the length has had to be expressed as 'between perpendiculars', as this is the only figure recorded – and as such is little use for scale modellers. Tonnage is a thorny problem, as many reference works do not specify the system used. I have followed the same procedure, so one must assume that in countries where, at the time a vessel was constructed, the metric system was officially in force, for example France, Germany, Portugal and Spain, then the displacements stated are in Metric Tons. Similarly, for example with British, British Empire, United States, Confederate and Japanese vessels the displacement will be expressed in Long Tons. To convert every single entry from Long Tons to Metric Tons and vice versa was simply one conversion too many, for little positive result. Dimensions, as well as distances, however, have all been expressed in both Metric and Imperial. The following abbreviations have been used to save space. Displ: displacement; L: length; B: beam; D: draught; bhp: brake horsepower of an internal combustion engine; ihp: indicated horsepower of a reciprocating steam engine; shp: shaft horsepower of a turbine; VTE: vertical triple expansion reciprocating steam engine; QF: quick-firer; SB: smooth-bore muzzle-loader; MLR: muzzle-loading rifled gun; BL: breech-loading gun; LA: low-angle gun; HA: high-angle gun; DP: dual purpose HA/LA gun; AA: anti-aircraft gun; AT: anti-tank missile; MG: machine gun; HMG: heavy machine gun; manpad: shoulder-fired AA missile; SA or SAM: surface-to-air AA missile. For guns which are described as, for example '3in L/50', the shell calibre is 3 inches and the barrel length is 50 times the diameter of the shell. A German Pak is an anti-tank gun, KwK is a tank gun, and FlaK is anti-aircraft. The Hotchkiss revolver cannon is a manually-operated five-barrelled gun firing explosive shells, in 37mm, 40mm, 47mm and 57mm calibres. The Hotchkiss 37mm QF comes in two different barrel lengths: the short Model 1885 which fires the same shell as the revolver cannon has no recoil mechanism. The 'Pom-Pom' is a Vickers Maxim heavy machine gun firing 37mm or 40mm explosive shells, so named for the distinctive sound it makes when firing.

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ACRE Armed Launch Independencia This small, ephemeral independent state came briefly into existence as a result of the so-called Acre War between Bolivia and Brazil. The First Acre Republic was declared on 14 July 1899, but the arrival of Brazilian warships at Puerto Alonso on 15 March 1900 put an end to the new Republic. This did not stop the mainly Brazilian residents of the area from rising in revolt against Bolivian rule and declaring the Second Republic of Acre in late 1900, during which the Bolivian armed launch Rio Afuá carried supplies to Puerto Alonso. On 14 October 1902 the Rio Afuá was captured by the insurgents at Puerto Alonso and renamed Independencia. She was subsequently used by the



rebels to transport tons of rubber to sell, in order to purchase arms and ammunition. The Third Republic of Acre was declared on 27 January 1903, which led the Bolivian President, General José Manuel Pando, to lead a Bolivian force to combat the Acreans. However, a diplomatic settlement was reached on 17 November 1903 which put an end to the fighting, and ceded the territory of Acre to Brazil. The Independencia, ex-Rio Afuá, became part of the Brazilian Navy.

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**ANGOLA**  
The following Portuguese patrol boats were transferred to Angola on independence in 1975: Antares; Bellatrix class P 366, P 368, P 377 and P 378; Júpiter class P 1134 – P 1137; Argos class P 361, P 362, P 372, P 374 – P 376, P 379, P 1130. For details, see PORTUGAL. Project 1400ME Zhuk On 23 January 1977 the Soviet Union transferred to Angola Grif No 35. The model transferred was armed with two twin 12.7mm HMG, and powered by two 1,000hp M-401BT diesel engines. For full details, see RUSSIA Part II.

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**ARGENTINA**  
Choele Choele The Argentine Navy recognised the need for gunboats to control its extensive river systems, and in 1869 it purchased the commercial screw steamer Maritiana/Transport for service on the Rio Negro (Black River), which runs for 342 miles (550km) inland from the sea. In October 1869 she was renamed Choele Choele. Choele Choele initially saw service on the Rio

Negro, based at Carmen de Patagones. Then in November 1870 she sailed up the Ibicuy following the revolution of Lopez Jordan. After a minor collision with the Brazilian monitor Barroso at Asuncion in 1873, she transferred to the Upper Parana. 1875 found her patrolling the Upper Paraguay, and the next year she was laid up. Launched: Before 1869 by Fontana Hnos, of Boca del Richuelo. Dimensions: Displ: 65 tons; L: 25m/82ft; B: 5.9m/19ft 4in; D: 1.7m/5ft 7in. Crew: 15–20. Power/Speed: Twin screws; coal- or wood-fired steam engine, 65ihp/4.5 knots. Guns/Armour: 1 × 8-pounder bronze SB/5mm flat iron plates protecting the hull. Fate: Pontoon 1878; sold for scrap 1891. ARA Uruguay and Paraná

Paraná and Uruguay were ordered from Lairds as part of President Domingo Faustino Sarmiento's reinforcing of the Argentine Navy after the war with Paraguay. They were designed as seagoing vessels, but with relatively shallow draught in order to be used on the rivers of Argentina. To protect them in the event of grounding, their hulls were built of iron 1¼in (31mm) thick, sheathed in teak and finally covered in zinc plates. Paraná was delivered to Argentina by an English crew, being commissioned on 2 May 1874. The following September her crew joined the 1874 revolution, but after that failed, she was recovered by the Argentine Navy in the port of Maldonado, Uruguay. She was re-armed in 1879. Between 1885 and 1889, Paraná was employed on the Paraná, Uruguay and de la Plata rivers, and carried out hydrographic surveys. Modernised in 1894, she was sold in 1900, and became the merchant ship Piedrabuena. She was finally wrecked in 1926. ARA Paraná. Uruguay had a much longer and more varied career, and is still in existence as a museum ship at the time of writing. Completed in 1874, on her arrival in Argentina she was involved in the revolt of the students at the Naval Academy, then in 1875 she carried infantry up the Uruguay River to combat the rebel Lopez Jordan. Rearmed in 1880 and overhauled in England between 1884 and 1886, she divided her time between rescuing mariners in distress on the high seas and patrolling the Uruguay and Paraná Rivers. In 1893 and again in 1900 Uruguay was rearmed with modern Armstrong guns. Then in 1900 she was taken in hand and converted to an Antarctic rescue ship. Her sailing rig was cut down, she was reengined with part of the machinery salvaged from the wrecked destroyer Santa Fe, most of her guns were landed, her magazines were reloaded with explosives to blast a path through ice and with provisions to last a year, and, most significantly, her hull was stiffened by the insertion of eight new bulkheads. With a much-reduced crew of just twenty-seven, she sailed to rescue the survivors of the Swedish Nordenskjöld expedition, who she discovered in October 1903 marooned on Paulet Island and Snow Hill Island. The following year she supported a French Antarctic expedition, then was used on regular resupply runs to the base at Orcadas. Finally laid up in 1926, Uruguay was saved from scrapping, and is a museum ship at Puerto Madero. Launched: 1873 by Laird Brothers, Birkenhead. Dimensions: Displ: 540 tons; L: 46.36m/152ft 1in; B: 7.62m/25ft; D: 3.35m/11ft. Crew: 104 as gunboat/27 as Antarctic rescue ship. Power/Speed: Single screw; horizontal steam engine, 475ihp + 2,000ft<sup>2</sup> (612m<sup>2</sup>) sail area/11 knots sail + steam, 6 knots steam only. Uruguay 1900: VTE steam engine, 1,850ihp/11 knots. Guns/Armour: 4 × 7in BL on Vavasseur mountings; 1879/1880: 1 × 6in gun + 2 × 90mm. Uruguay: 1893: 2 × 4.7in. 1900: 2 ×

4.7in + 4 × 3in. 1903: 4 × 3in; Disarmed.Fate:Paraná sold for merchant use 1900; Uruguay museum ship 2017.River monitors Los Andes on the left and La Plata on the right, seen in 1901. (Photo from Website )Los Andes and La PlataOrdered by President Sarmiento in 1872, these two turret ships were intended as river monitors, due to nervousness about using low-freeboard turret ships at sea following the HMS Captain disaster. Nevertheless, they would spend most of their service lives on seagoing expeditions and as guardships in the various river mouths. But in late 1878 Los Andes was part of the squadron which sailed up the Santa Cruz River and landed troops. In the same year her sister was stationed in the Uruguay River. In 1893 in the Paraná River, Los Andes was seized by revolutionaries, and was being used to run weapons to Rosario, when she was ambushed by loyal warships and knocked out of action opposite Espinillo Island. In 1899 Los Andes was stationed in the Rio Santiago and the River Plate, and in 1902 carried out hydrographic surveys of the Plate. The following year La Plata carried out river patrols. Briefly reactivated during the Great War, from 1923 Los Andes remained derelict and was sold for scrap in March 1931. La Plata was discarded in 1927 and sold to commercial firm Laminación Curia S. R. L. Her hulk was still in existence in 1961.Interestingly, they had ballast tanks which could reduce their freeboard in combat by 6ft (1.83m) in forty-five minutes.Launched:1875 by Cammell Laird, Birkenhead.Dimensions:Displ: 1,677 tons; L: 55.68m/182ft 8in; B: 13.4m/43ft 11in; D: 3.5m/11ft 6in.Crew:126.Power/Speed:Twin screws; 2 × compound steam engines, total 1,500ihp/9 knotsGuns/Armour:2 × 200-pounder/23 cal MLR/255mm turret; 160mm hull. 1883: 2 × 9.2in Armstrong BL; 2 × 3-pounder Armstrong QF; 4 × 37mm Hotchkiss QF.Fate:La Plata sold 1927; Los Andes sold 1931 and scrapped.Independencia and LibertadLibertad was originally laid down as 9 de Julio, but was rechristened when this name was given to a cruiser. These two interesting vessels were used as coast defence ships, but their original concept was described as that of 'riverine battleships', and they were deliberately given relatively shallow draught to enable them to patrol the river systems of Argentina or, as the report in The Engineer of 18 November 1892 states, 'to go where the ordinary armoured vessel could not possibly follow'. Krupp 24cm main guns were chosen for their main armament, but the gun mountings were of Elswick design and manufacture. Both had a slight tumblehome amidships, which caused the secondary armament to be mounted on sponsons. This had the advantage of making the forward 4.7in guns able to fire directly ahead, and the rear pair directly astern.ARA Libertad in 'as built' condition. Note the open torpedo-launching aperture just forward of amidships. In later years she would lose her bow scrollwork and the lower of her fighting tops. An enclosed pilot house would be constructed on top of her conning tower. The above-water torpedo tubes would be removed, no doubt on US Navy advice following their removal from all American battleships for safety reasons when in combat with other armoured vessels. (Photo from Website )Their introduction led to a great deal of interest, as they were well-armed and well-protected for their size. It would probably be more fitting to have described them as 'pocket armoured cruisers', but this type of description was still some three decades in the future when they appeared. Despite their designation, they spent very little of their seventy-year existence cruising the rivers of

Argentina. One notable occasion was on 29 September 1893, when Independencia was ordered to pursue and recapture the rebel-controlled Los Andes during the combat of Espinillo. By the end of the fight, Independencia had suffered just one hit from a machine-gun round, but Los Andes was flooding from a water-line hit by a 24cm shell from Independencia, and the rebels hid between foreign ships before surrendering. Independencia served as a mother ship for submarines from 1948, before being transferred to the Coastguard for duty as pilot station ship Recalada-Practicos. She was scrapped in 1968. Her sister-ship also became a pilot station ship, Interseccion-Practicos and was scrapped in the same year.

Launched: Independencia 1891, Libertad 1892 by Cammell Laird, Birkenhead.

Independencia profile. (Drawing courtesy of The Blueprints)

Dimensions: Displ: 2,336 tons; L: 73.1m/240ft; B: 13.53m/44ft 3in; D: 3.96m/13ft. Crew: 155. Power/Speed: Twin screws; 2 × compound vertical steam engines, total 2,897ihp/14.4 knots. Guns/Armour: 2 × 24cm Krupp BL; 4 × 4.7in Armstrong QF; 4 × 3-pounder Nordenfelt QF; 4 × 1in Maxim-Nordenfelt three-barrelled MG; 2 × 18in Whitehead torpedo tubes above the waterline/8in belt 5ft deep, closed by front 8in and rear 6in cross bulkheads; Curved protective deck 1in thick behind the belt, 2in thick at the extremities, curving down at the bow to reinforce the ram and extending to the stern to protect the steering gear; Barbette trunks 8in thick (upper part) and 5in thick (lower part); Main turrets 5in vertical and 3in sloping sections.

1883: 2 × 9.2in Armstrong BL; 2 × 3-pounder Armstrong QF; 4 × 37mm Hotchkiss QF.

Fate: Both scrapped 1968.

ARA Paraná and Rosario

The firm of Armstrong took over from Cammell Laird, to supply the last pair of armoured river gunboats, Paraná and Rosario. Following the previous 'riverine battleships', they too carried a heavy armament, with a pair of 6in howitzers for shore bombardment, able to drop their shells into trenches and gun emplacements on the river banks. The howitzers were backed up (literally) by two pairs of 12-pounder (3in) QF, but the close proximity as evidenced by the VIP photo below indicates that each group of three would be unlikely to be all fired directly over the bow or stern, due to severe blast interference.

Rosario was commissioned on 7 August 1909, and Paraná the next day, but their delivery to Argentina was delayed by a diversion to Boulogne-sur-Mer, for the inauguration of the statue of General San Martin.

Both gunboats had active careers patrolling the river systems, and carrying out cadet training on a regular annual basis, except during the Great War. Due to the unrestricted U-boat attacks on merchant ships, the supply of high-grade Welsh anthracite and other British coal was virtually cut off, and in 1917 both gunboats were laid up inactive. They served throughout the Second World War, Paraná being sold for scrap in August 1958. Rosario was sold in December 1959, and was dismantled in 1961 and 1962 in the San Fernando Canal, her teak decking being especially sought after for domestic flooring.

Marshal Estigarriba, President of Paraguay, on board Paraná in 1939. Note the breech of the Vickers 6in howitzer to the right, and the close proximity of the muzzles of the two forward 12-pounders on the left. (Photo from Website )

ARA Paraná in grey, probably following the Great War. Both sister-ships originally had ornate bow scrolls, but here they have been removed. (Photo from Website )

Launched: Paraná 28 April 1908, Rosario 27 July 1908, by Armstrong, Newcastle-on-Tyne.

Dimensions: Displ: 1,053 tons full

load; L: 76.4m/250ft 8in; B: 9.8m/32ft 2in; D: 2.74m/9ft. Crew: 145. Power/Speed: Twin screws; 2 × VTE steam engines, total 1,300ihp/15 knots. Guns/Armour: 2 × 6in/12 cal Vickers howitzers; 6 × 3in/50 cal QF; 8 × 7.65mm MG; 4 × 75mm field guns for landing parties/4in belt of Krupp cemented; 1in protective deck. Fate: Paraná scrapped 1958; Rosario scrapped 1961–2. ARA Murature and King These patrol boats were laid down as a class of four minelayers during the Second World War. During their construction, Murature and King were reclassified as patrol boats, leaving the other two vessels, Piedra Buena and Azopardo, to be completed as anti-submarine frigates. ARA P-21 King coming alongside. (Photo: Argentine Armed Forces) Breech end of the forward 10.5cm DP gun on ARA King, photographed on 19 May 2004 at North Darsena. (Photo from Website ) Murature at least was initially armed with four 10.5cm DP guns, the stern two being unshielded. No 3 gun was later changed for a twin Bofors mounting. After service in the Antarctic, in 1947 Murature joined the River Squadron, and two years later became flagship of the River Plate division. King joined the river patrols in 1950. During the revolt against the Peron regime in September 1955, while defending the Rio Santiago Naval Base, Murature shot down a Peronist Avro Lincoln bomber. At that time King was immobilised with her engines removed, but she was towed to the West Dock and covered it against air and ground attack by Peronist forces. Both units spent much of their later careers patrolling the river systems, even visiting the Brazilian Ebook Library. Murature was scrapped in 2014, but her sister survived up until the time of writing, still in service. Launched: King 3 November 1943, Murature 1944, by Rio Santiago Naval Yard. Dimensions: Displ: 1,030 tons; L: 77m/252ft 7in; B: 9m/29ft 6in; D: 4m/13ft 1in. Crew: 130. Power/Speed: Twin screws; 2 × Werkspoor diesel engines, total 2,500bhp/18 knots. Guns/Armour: 4 (later 3) × 10.5cm DP; 4 × 40mm Bofors; MG. Fate: Murature sold for scrapping September 2014; King in active service 2017. Murature class in profile.

**ARGENTINA** Choele Choele The Argentine Navy recognised the need for gunboats to control its extensive river systems, and in 1869 it purchased the commercial screw steamer Maritiana/Transport for service on the Rio Negro (Black River), which runs for 342 miles (550km) inland from the sea. In October 1869 she was renamed Choele Choele. Choele Choele initially saw service on the Rio Negro, based at Carmen de Patagones. Then in November 1870 she sailed up the Ibicuy following the revolution of Lopez Jordan. After a minor collision with the Brazilian monitor Barroso at Asuncion in 1873, she transferred to the Upper Parana. 1875 found her patrolling the Upper Paraguay, and the next year she was laid up. Launched: Before 1869 by Fontana Hnos, of Boca del Richuelo. Dimensions: Displ: 65 tons; L: 25m/82ft; B: 5.9m/19ft 4in; D: 1.7m/5ft 7in. Crew: 15–20. Power/Speed: Twin screws; coal- or wood-fired steam engine, 65ihp/4.5 knots. Guns/Armour: 1 × 8-pounder bronze SB/5mm flat iron plates protecting the hull. Fate: Pontoon 1878; sold for scrap 1891.

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covered in zinc plates. Paraná was delivered to Argentina by an English crew, being commissioned on 2 May 1874. The following September her crew joined the 1874 revolution, but after that failed, she was recovered by the Argentine Navy in the port of Maldonado, Uruguay. She was re-armed in 1879. Between 1885 and 1889, Paraná was employed on the Paraná, Uruguay and de la Plata rivers, and carried out hydrographic surveys. Modernised in 1894, she was sold in 1900, and became the merchant ship Piedrabuena. She was finally wrecked in 1926.

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**River monitors Los Andes on the left and La Plata on the right, seen in 1901.** (Photo from Website )

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reactivated during the Great War, from 1923 Los Andes remained derelict and was sold for scrap in March 1931. La Plata was discarded in 1927 and sold to commercial firm Laminación Curia S. R. L. Her hulk was still in existence in 1961. Interestingly, they had ballast tanks which could reduce their freeboard in combat by 6ft (1.83m) in forty-five minutes. Launched: 1875 by Cammell Laird, Birkenhead. Dimensions: Displ: 1,677 tons; L: 55.68m/182ft 8in; B: 13.4m/43ft 11in; D: 3.5m/11ft 6in. Crew: 126. Power/Speed: Twin screws; 2 × compound steam engines, total 1,500ihp/9 knots. Guns/Armour: 2 × 200-pounder/23 cal MLR/255mm turret; 160mm hull. 1883: 2 × 9.2in Armstrong BL; 2 × 3-pounder Armstrong QF; 4 × 37mm Hotchkiss QF. Fate: La Plata sold 1927; Los Andes sold 1931 and scrapped. Independencia and Libertad Libertad was originally laid down as 9 de Julio, but was rechristened when this name was given to a cruiser. These two interesting vessels were used as coast defence ships, but their original concept was described as that of 'riverine battleships', and they were deliberately given relatively shallow draught to enable them to patrol the river systems of Argentina or, as the report in The Engineer of 18 November 1892 states, 'to go where the ordinary armoured vessel could not possibly follow'. Krupp 24cm main guns were chosen for their main armament, but the gun mountings were of Elswick design and manufacture. Both had a slight tumblehome amidships, which caused the secondary armament to be mounted on sponsons. This had the advantage of making the forward 4.7in guns able to fire directly ahead, and the rear pair directly astern. ARA Libertad in 'as built' condition. Note the open torpedo-launching aperture just forward of amidships. In later years she would lose her bow scrollwork and the lower of her fighting tops. An enclosed pilot house would be constructed on top of her conning tower. The above-water torpedo tubes would be removed, no doubt on US Navy advice following their removal from all American battleships for safety reasons when in combat with other armoured vessels. (Photo from Website ) Their introduction led to a great deal of interest, as they were well-armed and well-protected for their size. It would probably be more fitting to have described them as 'pocket armoured cruisers', but this type of description was still some three decades in the future when they appeared. Despite their designation, they spent very little of their seventy-year existence cruising the rivers of Argentina. One notable occasion was on 29 September 1893, when Independencia was ordered to pursue and recapture the rebel-controlled Los Andes during the combat of Espinillo. By the end of the fight, Independencia had suffered just one hit from a machine-gun round, but Los Andes was flooding from a water-line hit by a 24cm shell from Independencia, and the rebels hid between foreign ships before surrendering. Independencia served as a mother ship for submarines from 1948, before being transferred to the Coastguard for duty as pilot station ship Recalada-Practicos. She was scrapped in 1968. Her sister-ship also became a pilot station ship, Interseccion-Practicos and was scrapped in the same year. Launched: Independencia 1891, Libertad 1892 by Cammell Laird, Birkenhead. Independencia profile. (Drawing courtesy of The Blueprints) Dimensions: Displ: 2,336 tons; L: 73.1m/240ft; B: 13.53m/44ft 3in; D: 3.96m/13ft. Crew: 155. Power/Speed: Twin screws; 2 × compound vertical steam engines, total 2,897ihp/14.4 knots. Guns/Armour: 2 × 24cm Krupp BL; 4 × 4.7in Armstrong QF; 4 × 3-pounder

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**Murature class in profile.**

**ARGENTINA ARGENTINA**

**Choele Choele**

The Argentine Navy recognised the need for gunboats to control its extensive river systems, and in 1869 it purchased the commercial screw steamer Maritiana/Transport for service on the Rio Negro (Black River), which runs for 342 miles (550km) inland from the sea. In October 1869 she was renamed Choele Choele. Choele Choele initially saw service on the Rio Negro, based at Carmen de Patagones. Then in November 1870 she sailed up the Ibicuy following the revolution of Lopez Jordan. After a minor collision with the Brazilian monitor Barroso at Asuncion in 1873, she transferred to the Upper Parana. 1875 found her patrolling the Upper Paraguay, and the next year she was laid up.

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Guns/Armour: 4 × 7in BL on Vavasseur mountings; 1879/1880: 1 × 6in gun + 2 × 90mm. Uruguay: 1893: 2 × 4.7in. 1900: 2 × 4.7in + 4 × 3in. 1903: 4 × 3in; Disarmed.

Fate: Paraná sold for merchant use 1900; Uruguay museum ship 2017.

River monitors Los Andes on the left and La Plata on the right, seen in 1901. (Photo from Website)

Ordered by President Sarmiento in 1872, these two turret ships were intended as river monitors, due to nervousness about using low-freeboard turret ships at sea following the HMS Captain disaster. Nevertheless, they would spend most of their service lives on seagoing expeditions and as guardships in the various river mouths. But in late 1878 Los Andes was part of the squadron which sailed up the Santa Cruz River and landed troops. In the same year her sister was stationed in the Uruguay River. In 1893 in the Paraná River, Los Andes was seized by revolutionaries, and was being used to run weapons to Rosario, when she was ambushed by loyal warships and knocked out of action opposite Espinillo Island. In 1899 Los Andes was stationed in the Rio Santiago and the River Plate, and in 1902 carried out hydrographic surveys of the Plate. The following year La Plata carried out river patrols. Briefly reactivated during the Great War, from 1923 Los Andes remained derelict and was sold for scrap in March 1931. La Plata was discarded in 1927 and sold to commercial firm Laminación Curia S. R. L. Her hulk was still in existence in 1961. Interestingly, they had ballast tanks which could reduce their freeboard in combat by 6ft (1.83m) in forty-five minutes.

Launched: 1875 by Cammell Laird, Birkenhead.

Dimensions: Displ: 1,677 tons; L: 55.68m/182ft 8in; B: 13.4m/43ft 11in; D: 3.5m/11ft 6in.

Crew: 126.

Power/Speed: Twin screws; 2 × compound steam engines, total 1,500ihp/9 knots.

Guns/Armour: 2 × 200-pounder/23 cal MLR/255mm turret; 160mm hull. 1883: 2 × 9.2in Armstrong BL; 2 × 3-pounder Armstrong QF; 4 × 37mm Hotchkiss QF.

Fate: La Plata sold 1927; Los Andes sold 1931 and

scrapped. Independencia and Libertad was originally laid down as 9 de Julio, but was rechristened when this name was given to a cruiser. These two interesting vessels were used as coast defence ships, but their original concept was described as that of 'riverine battleships', and they were deliberately given relatively shallow draught to enable them to patrol the river systems of Argentina or, as the report in *The Engineer* of 18 November 1892 states, 'to go where the ordinary armoured vessel could not possibly follow'. Krupp 24cm main guns were chosen for their main armament, but the gun mountings were of Elswick design and manufacture. Both had a slight tumblehome amidships, which caused the secondary armament to be mounted on sponsons. This had the advantage of making the forward 4.7in guns able to fire directly ahead, and the rear pair directly astern. ARA Libertad in 'as built' condition. Note the open torpedo-launching aperture just forward of amidships. In later years she would lose her bow scrollwork and the lower of her fighting tops. An enclosed pilot house would be constructed on top of her conning tower. The above-water torpedo tubes would be removed, no doubt on US Navy advice following their removal from all American battleships for safety reasons when in combat with other armoured vessels. (Photo from Website) Their introduction led to a great deal of interest, as they were well-armed and well-protected for their size. It would probably be more fitting to have described them as 'pocket armoured cruisers', but this type of description was still some three decades in the future when they appeared. Despite their designation, they spent very little of their seventy-year existence cruising the rivers of Argentina. One notable occasion was on 29 September 1893, when Independencia was ordered to pursue and recapture the rebel-controlled Los Andes during the combat of Espinillo. By the end of the fight, Independencia had suffered just one hit from a machine-gun round, but Los Andes was flooding from a water-line hit by a 24cm shell from Independencia, and the rebels hid between foreign ships before surrendering. Independencia served as a mother ship for submarines from 1948, before being transferred to the Coastguard for duty as pilot station ship Recalada-Practicos. She was scrapped in 1968. Her sister-ship also became a pilot station ship, Interseccion-Practicos and was scrapped in the same year.

Launched: Independencia 1891, Libertad 1892 by Cammell Laird, Birkenhead. Independencia profile. (Drawing courtesy of The Blueprints)

Dimensions: Displ: 2,336 tons; L: 73.1m/240ft; B: 13.53m/44ft 3in; D: 3.96m/13ft. Crew: 155. Power/Speed: Twin screws; 2 × compound vertical steam engines, total 2,897ihp/14.4 knots. Guns/Armour: 2 × 24cm Krupp BL; 4 × 4.7in Armstrong QF; 4 × 3-pounder Nordenfelt QF; 4 × 1in Maxim-Nordenfelt three-barrelled MG; 2 × 18in Whitehead torpedo tubes above the waterline/8in belt 5ft deep, closed by front 8in and rear 6in cross bulkheads; Curved protective deck 1in thick behind the belt, 2in thick at the extremities, curving down at the bow to reinforce the ram and extending to the stern to protect the steering gear; Barbette trunks 8in thick (upper part) and 5in thick (lower part); Main turrets 5in vertical and 3in sloping sections. 1883: 2 × 9.2in Armstrong BL; 2 × 3-pounder Armstrong QF; 4 × 37mm Hotchkiss QF. Fate: Both scrapped 1968. ARA Paraná and Rosario

The firm of Armstrong took over from Cammell Laird, to supply the last pair of armoured river gunboats,

Paraná and Rosario. Following the previous 'riverine battleships', they too carried a heavy armament, with a pair of 6in howitzers for shore bombardment, able to drop their shells into trenches and gun emplacements on the river banks. The howitzers were backed up (literally) by two pairs of 12-pounder (3in) QF, but the close proximity as evidenced by the VIP photo below indicates that each group of three would be unlikely to be all fired directly over the bow or stern, due to severe blast interference. Rosario was commissioned on 7 August 1909, and Paraná the next day, but their delivery to Argentina was delayed by a diversion to Boulogne-sur-Mer, for the inauguration of the statue of General San Martin. Both gunboats had active careers patrolling the river systems, and carrying out cadet training on a regular annual basis, except during the Great War. Due to the unrestricted U-boat attacks on merchant ships, the supply of high-grade Welsh anthracite and other British coal was virtually cut off, and in 1917 both gunboats were laid up inactive. They served throughout the Second World War, Paraná being sold for scrap in August 1958. Rosario was sold in December 1959, and was dismantled in 1961 and 1962 in the San Fernando Canal, her teak decking being especially sought after for domestic flooring. Marshal Estigarriba, President of Paraguay, on board Paraná in 1939. Note the breach of the Vickers 6in howitzer to the right, and the close proximity of the muzzles of the two forward 12-pounders on the left. (Photo from Website )

ARA Paraná in grey, probably following the Great War. Both sister-ships originally had ornate bow scrolls, but here they have been removed. (Photo from Website )

Launched: Paraná 28 April 1908, Rosario 27 July 1908, by Armstrong, Newcastle-on-Tyne. Dimensions: Displ: 1,053 tons full load; L: 76.4m/250ft 8in; B: 9.8m/32ft 2in; D: 2.74m/9ft. Crew: 145. Power/Speed: Twin screws; 2 × VTE steam engines, total 1,300ihp/15 knots. Guns/Armour: 2 × 6in/12 cal Vickers howitzers; 6 × 3in/50 cal QF; 8 × 7.65mm MG; 4 × 75mm field guns for landing parties/4in belt of Krupp cemented; 1in protective deck. Fate: Paraná scrapped 1958; Rosario scrapped 1961–2.

ARA Murature and King These patrol boats were laid down as a class of four minelayers during the Second World War. During their construction, Murature and King were reclassified as patrol boats, leaving the other two vessels, Piedra Buena and Azopardo, to be completed as anti-submarine frigates. ARA P-21 King coming alongside. (Photo: Argentine Armed Forces)

Breach end of the forward 10.5cm DP gun on ARA King, photographed on 19 May 2004 at North Darsena. (Photo from Website )

Murature at least was initially armed with four 10.5cm DP guns, the stern two being unshielded. No 3 gun was later changed for a twin Bofors mounting. After service in the Antarctic, in 1947 Murature joined the River Squadron, and two years later became flagship of the River Plate division. King joined the river patrols in 1950. During the revolt against the Peron regime in September 1955, while defending the Rio Santiago Naval Base, Murature shot down a Peronist Avro Lincoln bomber. At that time King was immobilised with her engines removed, but she was towed to the West Dock and covered it against air and ground attack by Peronist forces. Both units spent much of their later careers patrolling the river systems, even visiting the Brazilian Ebook Library. Murature was scrapped in 2014, but her sister survived up until the time of writing, still in service.

Launched: King 3 November 1943,

Murature 1944, by Rio Santiago Naval Yard. Dimensions: Displ: 1,030 tons; L: 77m/252ft 7in; B: 9m/29ft 6in; D: 4m/13ft 1in. Crew: 130. Power/Speed: Twin screws; 2 × Werkspoor diesel engines, total 2,500bhp/18 knots. Guns/Armour: 4 (later 3) × 10.5cm DP; 4 × 40mm Bofors; MG. Fate: Murature sold for scrapping September 2014; King in active service 2017. Murature class in profile. AUSTRIA POST-1918 Following the armistice signed on 3 November 1918 at the Villa Giusti, the entire Austro-Hungarian river flotilla was taken over by other nations. The Hungarians held the majority of the ships, and these took part in the brief fighting between the Communist regime and its neighbours. In April 1920 the victorious Allies finally decided on the allocation of the surviving Austro-Hungarian vessels. The Austrian Republic received no monitors, but were allocated the following river patrol boats: 120-ton type Barsch (formerly 'm'). On 30 July 1920 she was sold to Hungary (in exchange for the 60-ton patrol boat Siofok) and renamed Baja. For her subsequent service, see HUNGARY. Compo (formerly 'n'). She in fact never entered Austrian service, and on 6 October 1927 was sold to Hungary and renamed Győr. For her subsequent service, see HUNGARY. Stör (formerly 'p'). She was commissioned by Austria on 14 May 1921, but on 6 October 1927 was sold to Hungary and renamed Sopron. For her subsequent service, see HUNGARY. 60-ton type Fogas (formerly 'i'). On 6 October 1927 she was sold to Hungary and renamed Gödöllő. For her subsequent service, see HUNGARY. In addition, on 24 July 1927 Austria purchased Siofok (the former Austro-Hungarian Csuka) from Hungary. In Austrian service she did not take up her former name but was renamed Birago. 1920–1938 Birago After the Anschluss of 1938, the sole river patrol boat retained by Austria, the 60-ton Birago, was taken over by the German Kriegsmarine. They attempted to put her back into service and bring her up to modern German specifications, but the work was abandoned, and from 7 October 1939 she was scrapped at Linz.

**Pioneer Boats** Between the wars, the Austrian Bundesheer Pioneer Corps operated a flotilla of small motorboats. When these were armed they carried 8mm Schwarzlose MG. The 33-ton boat Gazelle was armed with a 20mm cannon in addition to the MG.

**14-ton Schleppboot (tug)** The 14-ton boats were named, in order of building, Krems, Drau, Mur, Traun, Salzach, Enns and Inn. Launched: April 1930 (Krems) – January 1937 (Inn), by Zeugsanstalt Krems. Dimensions: Displ: 14 tons; L: 14.4m/47ft 3in; B: 3m/9ft 10in; D: 0.80m/2ft 7½in. Power/Speed: Twin screws; diesel engines, total 200bhp/17 knots. Guns/Armour: 3 × 8mm Schwarzlose MG. Barsch in Austrian service between April 1920 and July 1929. (Drawing courtesy of Erwin Sieche) Birago as in 1935 after being purchased from Hungary. Note the folding mainmast and the telescoping armoured crow's nest. (Drawing courtesy of Erwin Sieche)

**14-ton Schleppboot.** (Drawing by Erwin Sieche) The design built as Gazelle. (Drawing by Erwin Sieche) 2cm Tankgewehr M 35. (Photo from Marine- und Flußkriegseinheiten by Erwin Steinböck)

**33-ton Schleppboot (tug) Gazelle** Launched: 1934 by Mittlere Schiffsteil. Dimensions: Displ: 32.8 tons; L: 21m/68ft 11in; B: 3.85m/12ft 7½in; D: 0.80m/2ft 7½in. Power/Speed: Twin screws; 2 × diesel engines, total 320bhp/11.8 knots. Guns/Armour: 1 × 20mm M 35 cannon; 2 × 8mm Schwarzlose MG. 1935 Kampfboot Designs In 1935 designs were drawn up for combat boats armed with

cannon. Two types were envisaged, the 5-ton type with a 20mm cannon, and the 9-ton type with a 47mm Böhler anti-tank gun. In the event neither type would be built.

**1945–2006** After the end of the Second World War, the Austrian government planned to build a flotilla of nine patrol boats to help secure the Danube as an international waterway. In fact only two boats were built, the small Oberst Brecht and the larger Niederösterreich.

**5-ton Kampfboot.** (Drawings by Erwin Sieche) The crew of Niederösterreich saluting a visiting Soviet squadron, Vienna, April 1985. (Photo courtesy of Erwin Sieche)

**Launched:** 1958 by Korneuburg Werft, No A601. Steel hull. **Dimensions:** Displ: 10 tons; L: 12.3m/40ft 4in; B: 2.51m/8ft 2in; D: 0.75m/2ft 5½in. **Crew:** 6. **Power/Speed:** Twin screws; 2 × Graf & Stift diesel engines, total 290bhp/14 knots. **Guns/Armour:** 1 × 84mm Carl Gustav recoilless anti-tank rifle; 1 × 0.50 cal Browning HMG. **Fate:** Stricken July 2006. Retained as museum exhibit.

**Niederösterreich** **Launched:** 1970 by Korneuburg Werft, No A604. Steel hull. **Dimensions:** Displ: 73 tons; L: 29.67m/97ft 4in; B: 5.41m/17ft 7in; D: 1.1m/3ft 7in. **Crew:** 9. **Power/Speed:** Twin screws; 2 × MWM diesel engines, total 1,620hp/22 knots. **Guns/Armour:** 1 × 20mm Oerlikon Mark 66 cannon; 1 × 84mm Carl Gustav recoilless anti-tank rifle; 1 × 0.50 cal Browning HMG; 2 × 7.62mm MG/Bulletproof bridge/wheel-house. **Fate:** Stricken July 2006. Retained as museum exhibit.

The Patrouillenbootstaffel was operated by the Army Pioneers up until 31 July 2006. Apart from the high diesel consumption of Niederösterreich during a time of severe budgetary restrictions, it was realised that both patrol boats were vulnerable to tank fire from the banks, and to aircraft, especially while negotiating the many locks of the post-war Danube, which has been dammed at several points to install electricity-generating stations. With their retirement, the long history of the Austrian riverine forces was brought to a close.

**Oberst Brecht** dazzle-painted. For a colour view, see Appendix 2.

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**AUSTRIA-HUNGARY**  
It is all too easy to dismiss the Austro-Hungarian Empire for its role in starting the First World War and its calamitous collapse at the end of that conflict. Apart from major contributions to art, music, ballet and architecture up to and during the Belle Époque, a visit to the entrance hall of the Vienna Army Museum will reveal the statues of the numerous Austrian marshals and generals who for centuries defended Central Europe against the expansion of the Ottoman Empire.

In the nineteenth and early twentieth centuries, Austrians were at the forefront of technical innovation. Robert Whitehead's first successful automotive torpedo was developed for the Austrian Navy. Dr Porsche's petrol-electric Landwehrzug all-wheel-drive artillery train was a sensation in 1912, the oceanographic exploration submersible Loligo was launched at Rijeka in 1913, and giant Škoda siege howitzers helped crush fortifications across Europe in 1914. At sea the Austro-Hungarian Navy were the first to launch dreadnoughts armed with triple turrets.

On the Danube, for centuries the Austrians, then the Austro-Hungarian Dual Monarchy and Empire, had maintained extensive flotillas of sail and oar-powered gunboats, blocking the river to Turkish encroachment. On Lake Garda, an Austrian flotilla had secured control of the lake during the Second and Third Wars of Italian

Independence. The Austrians were the first to build modern armoured river gunboats of what would become the classic model, inspired by the USS Monitor. In fact their designs were so successful that one of the very first, the Leitha, has been fully restored to virtually her condition of 1873 as a museum ship, and at the time of writing at least one other example, the hulk of the Bodrog, still exists in Serbia, awaiting restoration in her turn. The introduction of the Maros class inspired the Germans to produce the Rhein and Mosel, and the existence of the Austro-Hungarian monitors almost certainly influenced the later Russian river monitor classes. Developments would include high-angle howitzers carried to fire over high river banks and nearby hills and into trench systems, controlled from armoured crews' nests on telescoping masts. To pass under the Danube bridges, the masts would hinge at the base to fold flat. Later vessels had elaborate lattice masts which also telescoped and folded down. As rivers are relatively easy to blockade with mines, the Austro-Hungarian vessels could be fitted with complex mine rakes on the bows. Despite this, two of the monitors would fall victim to mines during the First World War. Once again, Austro-Hungarian technical skills would bring the lost vessels back into service relatively quickly. The two 'Danube Dreadnoughts', laid down but never completed, would have been tough opponents for all other river gunboats of the era. Projects for two even larger vessels were drawn up, but the design skills of the engineers were undermined by the collapse of the Empire during the Great War, and the later vessels would never be begun. To support the river monitors the Austrians also built a series of armoured river patrol boats, of which several would be deleted before and during the war. The initial classes of small vessels were adequate for patrol and policing duties, but were too vulnerable to modern artillery fire. However, the last 120-ton design was extremely successful and long-lived. This class would form the inspiration for the Czechoslovak President Masaryk. With the collapse of the Dual Monarchy in November 1918, most of the river monitors and patrol boats were divided up between various countries in the revised Europe of the post-war period. Their later developments can be traced under the individual country chapters. The European Danube Commission took over three of the oldest monitors, Leitha, Maros and Szamos, which were disarmed to be used as pontoons, and thanks to this Leitha was saved to be fully restored as a museum ship.

**Acknowledgements:** All photos and plans in this chapter, apart from those taken from the official archives or marked otherwise, are courtesy of Erwin Sieche, many coming from his personal collection.

**LAGOON GUNBOATS** Analogous to river gunboats are many of the lake gunboats, such as those described in the following section, but the Austrian Navy also ordered special gunboats designed to operate within the lagoon surrounding Venice. They were side-wheel paddle steamers, with the hull cut away at the stern to allow a clear field of fire for the large muzzle-loading guns. From the following photos and plan it is clear that they would not be able to operate on the open sea. They preceded the RN Rendel 'Flatiron' coast defence gunboats by some twelve years. By comparison the Rendel types were generally much larger, with the gun firing forward and aimed by manoeuvring the ship, as it could elevate but not traverse. The twin-screw Rendels could cross open stretches of water by lowering the gun by

means of a hydraulic mechanism, which lowered the centre of gravity of the ship and improved stability. However, whenever a Rendel was required to voyage any distance from its base, for example to carry out shore bombardment, it would usually be towed by a larger vessel. The two vessels on the left and the third of the same type in the centre background are Austrian lagoon gunboats Nos II, III and VI seen at Venice between 1855 and 1866. A rear view of lagoon gunboat No I at Venice between 1855 and 1866. At this time the armament was a 48-pounder muzzle-loader. Note the extreme cutaway stern section to allow the large gun to traverse. Lagoon gunboat profile. (Drawing courtesy of Karl Klaus Körner) Six lagoon gunboats were built, and when Venetia was ceded to Italy in October 1866 they were sold to the Italian Navy for 20,000 florins. The Austrians could very well have evacuated them along with the naval base contents and the rest of the fleet, but these gunboats were so specialised that they were probably thought unfit for any other duty, and in any case they would probably have had to be dismantled for sea transport. Then just five years later the Austrians decided to start building monitors for the Danube. For the lagoon gunboats' later configuration, see ITALY. Launched: 1855, by J Ruston, Vienna/Florisdorf. Sent in parts to Venice and reassembled by Guidecca. Dimensions: Displ: 75 tons; L: 30.5m/100ft; B: 5.18m/17ft; D: 0.9m/2ft 11in. Crew: 29–32. Power/Speed: Side paddle wheels; steam engine, 25 nominal hp/8 knots. Guns/Armour: 1 × 48-pounder iron SB; 1 × 7-pounder bronze SB howitzer Model 1842. Fate: Sold to Italy October 1866.

**LAKE GARDA FLOTILLA** A little-known aspect of the Austrian Navy was its presence on Lake Garda during the wars of Italian unification. In June 1859 the *Hess* and *Franz Joseph*, plus the *Benaco*, took part in the Second War of Italian Independence. The *Benaco* was lost on 20 June when she was sunk by a Piedmontese field gun battery at Salò. The lack of any French and Piedmontese naval units meant that the Austrians had complete dominance of the Lake. During the Third War of Italian Independence which began in June 1866, the *Hess* and *Franz Joseph* with six modern screw-driven gunboats – *Wildfang*, *Raufbold*, *Wespe*, *Uskoke*, *Scharfschütze* and *Speiteufel* – faced the five Italian gunboats supplied by France plus two Italian-built steamers *Solferino* and *Saint Martino*, along with *Benaco*, which the Austrians recaptured on 19 July in Gargano. With the end of the war, Lake Garda was ceded to Italy, except for a small strip of shoreline around Riva del Garda. The Austrian flotilla was dissolved and the vessels were sold to their former enemies for the sum of one million florins.

**Gunboat Franz Joseph on Lake Garda.** When sold to Italy she was renamed *San Marco*, and was used as a passenger steamer. (Photo from Ogliari, Francesco: *La navigazione sui laghi italiani – Lago di Garda*, Milan : Cavallotti, 1987)

**Hess** Launched: As *Hess* May 1852, by Escher Wyss, Zurich, assembled by Riva del Garda shipyard. Wooden hull. Dimensions: Displ: 360 tons; L: 45.4m/149ft; B: 5.5m/18ft; D: 1.5m/4ft 11in. Crew: 55. Power/Speed: Side paddle wheels; steam engine, 100ihp; brigantine rig. Guns/Armour: 2 × 18-pounder MLR; 2 × 7-pounder bronze SB howitzers Model 1842. In Italian service as gunboat: 2 × 12-pounder MLR; 1 × 3-pounder howitzer. Fate: Sold to Italy 2 December 1866 as *Prince Oddone*. Passenger steamer 1867. Scrapped 1890.

**YANGTZE EXPEDITION** The Austro-Hungarian Navy were participants in the exploration of China's rivers.

In 1890–1 the iron corvette SMS Zrinyi (launched 10 December 1870 by the Stabilimento Tecnico Triestino), explored the Yangtze River as far upstream as Nanking (Nanjing) and Hankow. Her crew sketched and mapped the river banks and took especial notice of the fortifications on both banks. Their work was useful during the fighting in the Boxer Uprising a decade later.

Ex-Austrian Hess as Italian Prince Oddone. (Painting by D Cavarrone, in the Genoa Naval Museum)

### RIVER MONITORS

All the Austro-Hungarian river monitors were named after tributaries of the Danube. Maros and Leitha

Although the American armoured vessels derived from the original Monitor were far from safe on the open seas, they performed well enough in the confines of river systems, where their low freeboard made for a small target, and their cylindrical Coles-style turret allowed for virtually all-round fire from just two guns.

Following the Crimean War, Turkey ordered five armoured gunboats of the Feth-ül-Islam class from France, and their appearance on the lower Danube from 1865 onward spurred the Austrians into responding. It was decided to build two armoured monitor-style gunboats, to be designed by the experienced K.u.K. Naval Architect-Inspector Josef Ritter von Romako. He would produce a design inspired by the USS Monitor type but incorporating several innovations. The most obvious new feature was the downward curve of the armoured deck at the bow and stern. This arrangement reduced the weights at both ends and contributed to the shallow draught of the vessels. Interestingly, in Britain Yarrow would be taking the opposite view as regards the stern of their river vessels, building a flat, wide stern to spread the weight. Yarrow's version did, however, require placing the screws in tunnels which Romako avoided, the hull being cut away aft for the screws.

Previous steam engines were slow-turning low-pressure types, usually employing a single large horizontal cylinder. For his new river monitors, Romako fitted a pair of 2-cylinder vertical engines turning at relatively high speed. This allowed him to use smaller propellers, essential given the vessels' shallow draught.

The riveted hulls were made of iron which in the case of Leitha has lasted for almost a century and a half. For the first time Bessemer steel was used for the armour, a 25mm layer being placed directly on the deck, and 44mm of vertical hull armour was fixed to 203mm of teak backing. The turret and conning tower had 50mm armour. In 1871, to protect against attacks by spar torpedoes, and particularly in view of the recent Austrian adoption of Whitehead's locomotive torpedo, thought was given to providing the monitors with a comprehensive anti-torpedo net protection, which would be hung at a distance from the hull on booms hinged vertically at the deck edge. Such an arrangement would have added substantial weight on a hull where shallow draught was essential, and the danger of part of the net coming adrift after battle damage or by snagging on a river obstacle, and entangling the screws or the rudder, meant it was quickly forgotten. For the later anti-mine protection, see below.

Profile of the Maros class as originally built in 1871. Note the conning tower built on top of the turret, as used on many early monitor designs. This arrangement was copied by the Germans on Rhein and Mosel. Not shown are the two spars mounted one each side of the bows for spar torpedoes, copying contemporary Turkish river monitors which used spar torpedoes at bow and stern as defence against enemy spar torpedo boats. There was originally no foremast, just a large

flagpole on the conning tower. The structures on the foredeck are WC boxes (the 'heads'). The galley is the box with a chimney in front of the funnel. An early modification was the addition of a spark-arrestor on the funnel, to avoid starting forest fires on the banks of narrow waterways. This was soon removed and would not be copied on subsequent designs. During the 1873 refit the flagpole on the conning tower was removed and replaced by a foremast in front of the WC boxes. Another innovative feature was the addition of flushing toilets, in the boxes on the deck forward, which were among the very first of their kind on-board ship. They have been faithfully reproduced on the reconstructed Leitha, as later repositioned on either side behind the funnel. Laid down in 1870 at Pest Flumaner Schiffbau AG in Budapest, both monitors were accepted into service in 1872. They first went into action during the Austro-Hungarian occupation of Bosnia-Herzegovina in September 1878, when they provided fire support to troops on the banks of the River Sava. Modern replicas of the two 15cm System Warendorf breech-loading guns originally mounted in each of the Coles-type turrets on Maros and Leitha in 1871. The turret crew numbered sixteen men, and a further ten ammunition handlers worked in the magazine below the turret, handing up charges. The guns used separate loading of shell and silk propellant bag, and could achieve a rate of fire of between four and six rounds a minute. The turret was rotated by hand, and for large degrees of training the whole ship was turned towards the target. (Photographed inside the replica turret on the reconstructed Leitha). Specifications as built 1870–1 Launched: Maros: April 1871; Leitha: May 1871, by Pest Flumaner Schiffbau AG, Budapest. Dimensions: Displ: 310 tons; L: 49.98m/164ft; B: 8.12m/26ft 7in; D: 1.07m/3ft 6in. Crew: 50. Power/Speed: Twin screws; 2 × 350ihp 2-cyl vertical steam engines/8.3 knots. Guns/ Armour: 2 × 15cm L/21 Warendorf BL; + from 1878: 2 × 25mm Palmkrantz manually-operated HMG/Deck 25mm (Maros), 19mm (Leitha); Hull 44mm on 203mm teak backing; Turret 51mm front, 44mm sides and rear; Conning tower 64mm. Fate: Rebuilt 1893–4. The original pair of monitors had been in service for over twenty years, and in reserve for several more, when it was decided to build a new pair, which would become the Körös and Szamos. At the same time as they were building, the improvements incorporated in the new pair were incorporated in the Maros and Leitha, giving them a new lease of life, and providing the Danube Flotilla with a quartet of monitors sharing common armament and similar performance. Their old engines were replaced by a pair of vertical triple expansion engines of greater power, raising their maximum speed to match that of the new monitors. The old twin turret and Warendorf guns were removed, and replaced by a new cylindrical turret mounting a single Škoda 12cm L/35 gun, the same as in the newer monitors. A new bulletproof citadel was installed, and a new oval-shaped conning tower was fitted behind the turret, with an 8mm Salvator-Dormus MG in a shield mounted on top. On each side of the funnel, the old 25mm Palmkrantz MG were replaced by a pair of 47mm Hotchkiss revolver cannons with a cyclic rate of fire of forty rounds a minute, providing a much improved defence against torpedo boats. During the Great War this armament would be further modified, as shown in the following drawings: Leitha would receive a 7cm L/42 gun in a large shielded mounting at the stern, a short-barrelled 7cm L/18 gun would be mounted

to the rear of the superstructure, and two tall cylindrical MG turrets would be installed, each armed with an 8mm Schwarzlose.25mm Palmkrantz four-barrelled manually-operated MG. In 1881 it was proposed to fit two mountings, one behind the pair of WC boxes on the forward deck, and one near the stern. These mountings were given more command by placing them on either side of the funnel on a platform deck, supported by the boxes for the heads which were moved from the foredeck to either side behind the funnel. The complete gun weighed 300kg, and the magazine held a total of thirty-two rounds, eight for each barrel. The cyclic rate of fire was over ninety rounds a minute. Maros would be rearmed with a total of three 7cm L/18 guns, all in shielded mounts, two of which replaced the 47mm Hotchkiss. The rebuilt Maros on the Danube in about 1900. At that time she was armed with a single modern Škoda 12cm L/35 turret gun, a pair of 47mm Hotchkiss revolver cannons mounted port and starboard behind the funnel, in place of the 25mm Palmkrantz, and a shielded 8mm Salvator-Dormus Model 1893 MG on top of the new conning tower. Two spars were carried on board, as mooring poles (Schorbaum) to distance the vessel from a sloping riverbank. Maros as rebuilt 1893–4, with a central superstructure and modern armament. The drawing shows her with the three 7cm L/18 guns fitted as secondary armament during the Great War. One has replaced the 8mm MG on the conning tower, and the rear pair are situated on top of the repositioned WC boxes, and replace the earlier Palmkrantz MG and Hotchkiss revolver cannons. (Drawing by Erwin Sieche) The replacement turret fitted to Maros and Leitha mounting a single 12cm L/35 Škoda gun. Two identical turrets and Škoda guns were also fitted to Szamos. As the conflict progressed both monitors would also carry a pair of 37mm Pom-Poms to subdue small-arms fire from the river banks. With the planned introduction of Monitors VII and VIII in 1914, both Maros and Leitha were due to be deleted. However, with the imminent outbreak of war both were retained, and the old ships saw considerable action. At first part of the Sava River monitor group based at Breko, they provided fire support to the Austro-Hungarian army. In late September 1914, on forcing the entry to the Sava River, Leitha received a hit on her turret: the gun crew were killed and the guns put out of action. She was repaired at the Slavonic-Mitroviča yard. Then in October 1915 they joined the other monitors in the attack on the Serb capital of Belgrade, fighting duels with Serb and Allied artillery. Between December 1915 and August 1916 both monitors remained at Ruschuk. Then Leitha shelled Romanian oil and harbour installations at Giurgiou. Meanwhile, Maros guarded the Belene Channel. From the winter of 1916 up until the end of the war both ships were based on the river between Budapest and Orsova. In 1919 Leitha was renamed Lajta in Hungarian service, and fought the Czechs and Slovaks, before both monitors were handed over to Yugoslavia. They never entered service, being discarded in 1921. While Maros was scrapped, Leitha was sold into commercial service, and in 1928 became the elevator hulk József Lajo.

Specifications as rebuilt 1894  
Dimensions: Displ: 310 tons; L: 49.98m/164ft; B: 8.12m/26ft 7in; D: 1.07m/3ft 6in. Crew: 57. Power/Speed: Twin screws; 2 × 600ihp 2-cyl VTE steam engines/10 knots. Guns/Armour: 1 × 12cm L/35; Secondary armament 1897: 2 × 47mm Hotchkiss revolver cannons; 1 × 8mm Salvator-Dormus MG. 1916: Maros: 3 × 7cm L/18; Leitha:

1 × 7cm L/42 + 1 × 7cm L/18 + 2 × 8mm Schwarzlose MG. Later 2 × 37mm Pom-Poms added on open mounts/Turrets 75mm front (3 × 25mm laminates), 50mm sides and rear (2 × 25mm laminates); Hull 44mm on 90mm teak backing; Deck 25mm (Maros), 19mm (Leitha); Conning tower 50mm (2 × 25mm laminates); Superstructure: bulletproof. Fate: Maros scrapped 1921; Lajta disarmed 1921, from 1928 used as elevator hulk; museum ship 2010. In the 1970s Hungarian naval historian Dr. Károly Csonkaréti discovered the old ship, and with naval enthusiast Dr. András Margitay-Becht worked to try to preserve her. Leitha as rebuilt in 1893–4, with new superstructure and new guns, in a different layout to those on her sister. Again, the drawing shows her Great War configuration of 1915–18. (Drawing by Erwin Sieche) The 7cm L/42 gun mounted on the stern of the rebuilt Leitha. 7cm L/18 gun. The 37mm Vickers Pom-Pom fitted during the Great War to counter enemy small-arms fire. Salvador-Dormus Model 1893 delayed-blowback machine gun manufactured by Škoda. In view of its lightweight construction, and the curious arrangement whereby the rate of fire was controlled by adjusting the swinging pendulum exposed below the breech, it was rejected by the Army. However, it functioned well enough on fixed mountings in fortresses and on naval vessels. (Photo via Wikipedia) They had a difficult task, as the ex-Leitha consisted of simply an empty hull, lacking her internal partitions and watertight bulkheads, with no steering or mooring fittings, which prevented her legally from being moved. Her superstructure had gone, and new holes had been cut in the deck. The side armour had long disappeared. Despite all the problems, in 2005 she was hauled up on dry land for preservation, and by 2010 had undergone a complete transformation, restoring her to the state she was in when first commissioned. At the time of writing, Lajta serves as the honorary flagship of the Hungarian Army's river warship regiment.

Szamos and Körös More than twenty years after the introduction of the Maros and Leitha, it was decided to build a second pair of river monitors for the Danube. Designer Josef Thiel took advantage of the developments since the launch of the original pair, and produced two miniature pre-dreadnoughts with a main gun turret fore and aft of a substantial superstructure, topped with an imposing funnel for forced draft, and numbers of smaller guns. Note that the class still retained the deck profile of Maros and Leitha, curving downwards at bow and stern. For the first time, the screws turned partly in shallow tunnels in the underneath of the hull. A full-scale wooden dummy of the Maros class built in the spring of 1915, intended to draw fire from hidden French and Serb batteries at Belgrade, thus exposing their positions. Unfortunately, details of the dummy were leaked and the ruse failed. Lajta as reconstructed as a museum ship in 2010 to her configuration in 1873. (Drawing by Dr Balagh Tarras) The armoured conning tower was now circular, and separated from the main superstructure. A second cylindrical tower supported the gun mounting at the rear of the superstructure. Armour was now nickel-steel, increased to 50mm for the belt, backed by 90mm of teak, with 75mm on the turrets, 19mm on the deck, and 40mm on the conning tower. The remainder of the superstructure was built of bulletproof plating. The main guns were 12cm L/35 models, those on Körös being supplied by Krupp, and those on Szamos by Škoda, presumably to compare the two types. Significantly, no more Krupp guns were ordered. Each of the

cylindrical structures carried a long 7cm gun, and a tall cylindrical turret amidships mounted an 8mm MG, initially a Salvator-Dormus model, with a second MG carried in the crow's nest. Both would later be replaced by the 8mm Schwarzlose. Körös in pre-war livery. Her main armament guns were built by Krupp, whereas the guns on her sister were built by Škoda. Szamos in wartime livery. Note the semaphore device mounted above the bridge, and the raised forward bulwarks. Also the Škoda 12cm guns are mounted higher in the turret with a smaller embrasure than on Körös. Körös during the First World War. (Drawing by Erwin Sieche) The drawing shows the addition of the spotting top in the form of an armoured crow's nest. In photographs this is seen at different heights above the deck, because the masts were able to telescope to pass under river bridges. For the same reason the funnels hinged rearwards. Prominent at the bow was the now-standard Danube anchor in the form of a four-arm grapnel. As the moored or floating mine posed the greatest risk to these river monitors, an elaborate minesweeping rake structure could be deployed over the bows to catch and explode these deadly weapons. Below decks, Yarrow boilers supplied steam to two vertical triple expansion engines, built by Schichau in Elbing, giving a speed of 10 knots. They were built in 1891–2 by Schönichen & Hartmann at Budapest (Körös was originally to be named Theiss). Both vessels were active during the Great War. Körös engaged Serbian artillery within hours of the declaration of war, taking six direct hits on 4 August 1914. Both vessels participated in the breakthrough into the Save River in late September, and they featured in contemporary illustrations of the bombardment of Belgrade. On 28 August both were attacked unsuccessfully by three Romanian torpedo boats. The following day they shelled oil depots at Giurgiu and shipping in Zimnicea. Körös took part in the operation to destroy the Romanian pontoon bridge at Rjahovo on 2 October 1916, in return taking twelve hits from Romanian artillery and suffering heavy damage. After Russia and Romania had been knocked out of the war, Körös and Szamos participated in the Black Sea cruise to Odessa by Flottenabteilung Wulff, and operated on the River Dnepr. Returning to the Danube, they covered the retreat of the Austro-Hungarian forces, and ended the war at Belene. In 1919 they were taken over by Hungary, and fought against the Czechs and Slovaks. Körös showing her mine rake. The cumbersome device could be lowered to attempt to catch moored and floating mines. Her crow's nest on its telescopic mast has been lowered. Both vessels were withdrawn from service in 1921, Szamos becoming crane pontoon FK 202, and Körös was handed over to the Yugoslavs. For her subsequent service, see YUGOSLAVIA. Launched: 1892 by Schönichen & Hartmann, Budapest. Dimensions: Displ: 448 tons; L: 54m/162ft 9in; B: 9m/25ft 9in; D: 1.2m/5ft 3in. Crew: 77. Power/Speed: Twin screws; 2 × 600ihp 3-cyl VTE steam engines/10 knots. Guns/ Armour: 2 × 12cm L/35; 2 × 7cm L/42 QF; 2 × 8mm MG/Turrets 75mm front (3 × 25mm laminates), 50mm sides and rear (2 × 25mm laminates); Hull 40mm + 10mm on 90mm teak backing; Bulkheads 50mm; Deck 19mm; Conning tower 50mm. Fate: Körös to Yugoslavia as Morava; Szamos crane pontoon FK 202. Körös crewmen displaying pieces of a Romanian torpedo recovered after the unsuccessful attack on their monitor on 28 August 1914. Körös on an unknown date, having the Krupp gun in her aft turret removed/replaced, by the expedient of



mooring under a railway (?) bridge. Note her 7cm L/42 on the stern which normally is mounted in the gun tub where the officer is standing, and her armoured crow's nest lowered. Both of the gun turrets on Körös were armed with Krupp 12cm L/35 C/89 guns on Krupp mountings. Note that because the gun pivots further back on the mounting, the embrasure is much larger than on the turrets with Škoda 12cm L/35 guns, as on her sister Szamos (and the rebuilt Maros and Leitha). The barrel is also set lower in the embrasure, which makes it easy to distinguish between the two sister-ships.

Temes (I) and Bodrog

Following the decision in the 1890s to build a pair of new monitors every ten years, the Temes class were constructed by the Danubius Schönichen-Hartmann AG Yard in Budapest, and launched in 1904. In this class the sloped deck arrangement of the previous four vessels was replaced by a more classic horizontal deck line. In order to double the ahead firepower, always an advantage in narrow river environments, Josef Thiel designed the class with the narrow 'tadpole'-shaped main turrets, the circular armoured conning tower being placed between them. Astern firepower was relegated to a single 12cm short-barrelled howitzer behind a minimal shield. The shield was later extended to give the gunners more protection. The great advantage of the howitzer was its ability to fire over high river banks, intervening hills, and into trenches, observed and corrected from the tall armoured crow's nest on the mast.

The crew of Temes (I) coaling ship from a lighter. Note her name on the lifebelt, her twin wheels on the bridge, and an MG under a tarpaulin on the bridge wing.

Temes (I) as in 1904. Note the mast can be pivoted down on the battery deck and the funnel can hinge rearwards to clear bridges. In her original configuration Temes (I) could always be told apart from her sister Bodrog by her two large ventilator cowls at the rear of the battery deck. (Drawing by Erwin Sieche)

The two turrets of Bodrog with the shielded 7cm L/18 gun above, photographed at Odessa. Note the slatted optical signalling device behind the gun shield, used to send messages in Morse. Above the bridge is a gun tub with an 8mm MG.

The Škoda 12cm L/35 turrets fitted to Temes (I) and Bodrog. Note the severely restricted interior space.

The 12cm L/10 howitzer mounted on the stern of both vessels, with its small shield.

Bodrog fired the first shots of the Great War even before the official start of hostilities, capturing three Serbian boats at Zemun on 26 July 1914. Temes (I) was flagship of the Danube Flotilla from 1908 to 1914. She was an early victim of a Serbian mine, sinking on 23 October 1914 with thirty-one men killed and ten wounded. She was salvaged and rebuilt with two high-angle 9cm L/45 anti-balloon gun mountings replacing her single 12cm howitzer.

Bodrog participated in the destruction of the pontoon bridge at Rjahovo on 2 October 1916. In April 1918 both monitors crossed the Black Sea to Odessa as part of Flottenabteilung Wulff. Retreating towards Budapest at the end of the war, on 31 October 1918 Bodrog grounded on a sandbank downstream from Belgrade, and was captured by Serb forces. In April 1920 Temes (I) was passed to Romania as the Ardeal. For her subsequent service, see ROMANIA. Bodrog was passed to Yugoslavia as the Sava. For her subsequent service, see YUGOSLAVIA.

The wreck of Temes (I), sunk after hitting a Serb mine in the Sava River on 23 October 1914. Thirty-one crewmen lost their lives. The heavy loss of life and the extent of the damage confirms that she suffered a partial magazine explosion when the

mine detonated in the region of the starboard 12cm turret. She was repaired in Budapest, and returned to service with a modernised secondary armament. 4.7cm L/44 QF. Launched: Temes (I) 26 March 1904, Bodrog 12 April 1904, by Danubius Schönichen-Hartmann AG, Budapest. Dimensions: Displ: 440 tons; L: 56.2m/184ft 5in; B: 9.50m/31ft 2in; D: 1.2m/3ft 11in. Temes (I) rebuilt: Displ: 440 tons; L: 58.6m/192ft 3in; B: 9.56m/31ft 4in; D: 1.5m/4ft 11in. Crew: 86. Power/Speed: Twin screws; 2 × 700ihp 3-cyl VTE steam engines/17.8 knots. Temes (I) rebuilt: 16.9 knots. Guns/Armour: 2 × 12cm L/35; 1 × 12cm L/10 howitzer; 2 × 37mm Hotchkiss revolver cannon, replaced 1913/1914 by 2 × 47mm L/44 QF; 1 × 8mm MG/Turrets 75mm front, 50mm sides, 40mm rear; Hull 40mm + 10mm on 90mm teak backing; Deck 19mm; Conning tower 50mm. Bodrog 1915: 2 × 47mm replaced by 1 × 7cm L/18 QF; MG increased to 2. Temes (I) 1917: 2 × 12cm L/35; 2 × 9cm L/45; 2 × 8mm MG. Fate: Bodrog to Yugoslavia; Temes (I) to Romania. The gunners manning the 12cm howitzer on the stern of Bodrog. Note how cramped the cupola is. (Photo courtesy of ) One of the two 47mm L/44 QF guns on the battery deck of Bodrog. Note the very short recoil, indicated by the polished part of the barrel. (Photo courtesy of ) Temes (I) firing her new 9cm guns. From the assembled guests on the left, including at least one lady, this may be her recommissioning ceremony. Temes (I) as re-commissioned on 23 April 1917. The drawing shows her reduced forward superstructure, and the 12cm howitzer aft replaced by two new 9cm guns with AA capability. She had been lengthened by 2.40m (7ft 10½in). Note the funnel hinging arrangement to pass under low bridges. (Drawing by Erwin Sieche) 9cm L/45 anti-balloon gun at full elevation. The mounting had a range of -3° to +90°. The fitting of two of these modern weapons gave the rebuilt Temes a powerful anti-aircraft capability for the time. Inn and Enns A hundred tons larger than the preceding class, Inn and Enns carried a powerful armament. For the first time the main guns were mounted in a twin turret, which saved weight compared with the two single turrets on Temes and Bodrog. The single howitzer for high-angle fire was replaced by three of the same calibre, mounted in between-deck cupolas which gave all-round armour protection to the gunners, albeit at the expense of internal space. The anti-balloon function was fulfilled by two 47mm L/50 guns on the superstructure. The telescoping mast carrying an armoured crow's nest was now standardised. This had three sections which retracted one inside the other, following which the retracted mast could be folded down to lie flat to clear bridges. The funnel was also much lower than on the previous classes, for the same reason. Enns with folding pole masts in place of the lattice mast carried by her sister Inn. The class has the two-gun forward fire capability of Temes (I) and Bodrog, now mounted for the first time in a twin turret, with longer guns. Indirect fire capability was greatly increased by replacing the single shielded 12cm L/10 howitzer at the stern with three such weapons, mounted in armoured cupolas, countersunk into the rear deck. The tertiary armament now comprised two 47mm L/50 DP guns in large shields, mounted on the superstructure. (Drawing by Erwin Sieche) Enns completed in October 1914, and she soon undertook her first artillery duel with Serbian gunners defending Belgrade. She twice attacked the Flaminia pontoon bridge, then wintered on the Lower Danube at the close of 1917. Taken over in October 1918 by Hungary as

the Drava, she was finally handed over to Yugoslavia as the Drava: for her subsequent service, see YUGOSLAVIA. Her sister-ship was completed in April 1915. On 22 September 1917 Inn struck one of five Serbian mines near Braila, and sank in 7m of water in five minutes. The Danube Flotilla's Chief of Staff, Korvettenkapitän von Förster, and one warrant officer were killed, and eight crewmen were injured. Salvaged between two barges in December 1917, she was repaired at Budapest and lengthened by 2.4m (7ft 10½in) by adding a block between ribs 15 and 19. In April 1919 she became the Hungarian Ujvidek, then under the Communist regime of Bela Kun she was renamed Marx. Finally, she was ceded to Romania as the Basarabia. For her subsequent service, see ROMANIA. Launched: 29 July 1914 (Enns) by Stabilimento Tecnico Triestino Werft, Linz; 25 February 1915 (Inn) by Ganz & Co, Budapest. Dimensions: Displ: 536 tons; L: 60.2m/197ft 6in; B: 10.5m/34ft 5in; D: 1.3m/4ft 3in. Inn rebuilt: Displ: Approx. 700 tons full load; L: 62.6m/205ft 5in; B: 10.5m/34ft 5in; D: 1.3m/4ft 3in. Crew: 86. Power/Speed: Twin screws; 2 × 750ihp (Inn rebuilt: 2 × 780ihp) oil-fired 3-cyl VTE steam engines/17.8 knots Guns/Armour: 2 × 12cm L/45; 3 × 12cm L/10 howitzers; 2 × 47mm L/50 QF; 6 to 8 × 8mm MG/Turrets 75mm front, 50mm sides, 40mm rear; Hull 40mm + 10mm on 90mm teak backing; Deck 25mm; Conning tower 50mm front, 40mm rear, 2 × 10mm plates roof. Fate: Enns to Yugoslavia; Inn to Romania. Inn with telescopic foremast and armoured crow's nest. This type of mast was first tested on the Maros class. It telescoped downwards in three sections. As it was offset to starboard, the telescoped mast could be folded backwards to lie alongside the funnel. Inn sunk in 7m of water. She struck a mine 14km (almost 9 miles) downriver from Braila on 22 September 1917. Three men were killed, two seriously injured and six suffered minor injuries. Salvage work on Inn began in October 1917. She arrived in Budapest for repairs in February 1918, and her bows were lengthened by 2.4m (7ft 10½in). Note her two 47mm L/50 DP mounts on the rear of the battery deck. The large shield has been removed from the mount on the left, and both barrels are missing, presumably to lighten the wreck. Also visible is her rear conning tower. Enns seen after suffering damage during the bombardment of Belgrade on 8 October 1915. She was hit below the waterline by a 138mm shell fired by the French battery on Topcider Hill. Here her pumps are in action to keep her afloat, and she safely reached Budapest for repairs. Twin 12cm L/45 gun turret. The French 138mm shell which fortunately did not explode. The 12cm magazine was flooded. Single 12cm L/10 howitzer in armoured cupola. Enns and Inn carried three of these cupolas on the rear deck, countersunk into the deck plating, providing a powerful indirect fire capability. Sava and Temes (II) (later renamed Bosna) Sava and Temes (II) followed the lines of Inn and Enns. It was originally planned to mount a second twin 12cm L/45 turret at the stern, but wartime shortages meant that the same three-cupola arrangement as on Enns and Inn was finally fitted. The rearmost of the three cupolas exchanged the short-barrelled howitzer for a pair of 7cm (actually 66mm) L/26 anti-balloon guns with +90° elevation. In September 1918 Sava entered a Romanian drydock in Galata, but with the general collapse in November she was withdrawn to Budapest. Given the Hungarian name Soca in January 1919, in April 1920 she was handed over to Romania as the Bucovina: for her subsequent service, see ROMANIA. When the

original Temes was salvaged and rebuilt, in May 1917 Temes (II) was renamed Bosna. She was one of the monitors in Flottenabteilung Wulff, crossing the Black Sea to Odessa and operating on the Dnepr. In January 1919 she was handed over to Yugoslavia as the Vardar. For her subsequent service, see YUGOSLAVIA. Sava moored beside the walls of the fortress of Smederevo, built in 1428. Her lattice mainmast has been retracted. This mast proved too top-heavy, so finally Sava was rebuilt with a pole mainmast. Sava as built, with her telescopic mast, which folded forward once retracted. (Drawing by Erwin Sieche) Launched: 31 May 1915 (Sava), 20 June 1915 (Temes II) by Stabilimento Tecnico Triestino Werft, Linz. Dimensions: Displ: 600 tons; L: 61m/200ft 2in; B: 10.5m/34ft 5in; D: 1.3m/4ft 3in. Crew: 86. Power/Speed: Twin screws; 2 × 800ihp oil-fired 3-cyl VTE steam engines/17.8 knots. Guns/Armour: 1 × twin 12cm L/45; 2 × 12cm L/10 howitzers; 1 × twin 7cm L/26 QF; 2 × 47mm L/50 DP guns; 6 × 8mm MG/Turrets 75mm front, 50mm sides, 40mm rear; Hull 40mm + 10mm on 90mm teak backing; Deck 25mm (2 × 12.5mm laminates); Conning tower 50mm front, 40mm rear, 45mm roof. Fate: Bosna to Yugoslavia; Sava to Romania. Bosna. Her masts pivoted to be able to pass under bridges. Note the three MG turrets on each side of the bridge. Temes (II), renamed as Bosna, without a telescopic mainmast. (Drawing by Erwin Sieche) A pair of Škoda 66mm L/26 guns (twin mounting number 266, probably from a Wels class patrol boat). These guns were formerly on display at the Budapest Military Museum. (Photographed on 18 May 1986 by Erwin Sieche) The twin 66mm stern mounting with +90° elevation. The photo shows the cupola on Temes (II). (Photo from Website )

Monitors XI and XII These powerful vessels were designed to replace the original Maros and Leitha. Voted in the 1916 Budget, they were laid down at the Linz shipyard, but the chaotic state of the Empire and material shortages meant that they were never completed. Monitors XI and XII were broken up on the slips shortly after the end of the war. If they had entered service they would have proved to be formidable river combat ships. Their two large turret guns would have been useful for shore bombardment, and their secondary armament of no less than five 9cm DP guns could have fended off Allied air attacks of the later war period. For the first time, the monitor design included a double bottom, as an increased insurance against mines and grounding damage. Also, the anti-mine and torpedo bulkhead protection, added to their greatly increased size and beam, would have enhanced their survivability – except, perhaps, in the case of a strike in the region of one of the wing turret magazines, as had occurred with Temes. The British ‘Insect’ class had been designed to out-gun the existing Danube monitors in the early years of the war. They would have had great difficulty opposing Monitors XI and XII. Launched: Laid down at Stabilimento Tecnico Triestino Werft, Linz. Dimensions: Displ: 1,265 tons; L: 76m/249ft 4in; B: 13m/42ft 8in; D: 2m/6ft 7in. Power/Speed: Twin screws. Guns/Armour: 2 × 19cm L/35; 2 × twin and 1 × single 9cm L/45 anti-balloon guns; 2 × 47mm L/33 QF; 4 × 8mm MG/Hull 75mm; Anti-mine and torpedo bulkheads 20mm; Deck 30mm slopes, 17mm flat; Double bottom. Fate: Never completed; scrapped after the war. The proposed appearance of Monitors XI and XII if they had been completed. As they were designated ‘Ersatz Maros’ and ‘Ersatz Leitha’ it is possible they would have taken up the names

of the very first monitors when these were withdrawn. (Drawing by Erwin Sieche) Single 19cm L/35 turret. Profile and plan of the Škoda design of a twin 9cm L/45 turret proposed as secondary armament for Monitors XI and XII. The fifth gun of this calibre was to have been mounted in a shield on the rear superstructure, similar to those on the rebuilt Temes. A future monitor project proposed in 1915 by Engineers Silvius Morin and F Cossutta of Stabilimento Tecnico Triestino. (Drawing by Erwin Sieche) Monitor Design Projects This long shallow-draught vessel was intended to mount two Škoda 30.5cm L/12 siege howitzers, of the type used since 1914 to batter fortifications from the Western Front to Poland. The huge howitzers, each weighing more than 20 tons, fired a HE shell weighing 287kg at a rate of ten shells an hour, to a range of 12,300m (13,500 yards). The latest model, to be mounted in the monitor, in hooded barbets, was the M 16 with longer L/12 barrel and 360° traverse. Interestingly, in 1918 a Škoda howitzer, the larger 38cm L/17 model, was test-fired on the old coast defence ship SMS Budapest in place of the forward turret. It proved unsuccessful due to the ship continuing to roll with the recoil of firing, making for poor accuracy with subsequent shots. There is no reason to believe that the river monitor design would have been any more successful had the vessel been constructed. Proposed secondary armament was to be two of the powerful 7cm L/50 guns in DP mountings. Dimensions: Displ: 800 tons; L: 68m/223ft 1in; B: 11m/36ft 1in; D: 1.5m/4ft 11in. Guns/ Armour: 2 × 30.5m L/12 howitzers; 2 × 7cm L/50 anti-balloon guns; 4 × 8mm MG/Barbets 40mm; Hull 60mm to 30mm; Deck 30mm; Conning tower 50mm front, 40mm rear. Fate: Never begun, project only. (Drawing by Erwin Sieche) On 11 December 1917, Engineer Silvius Morin proposed a super river monitor model displacing 2,000 tons. Suitable single-gun 24cm L/40 turrets were available on the pre-dreadnought coast-defence ship SMS Budapest, and the old armoured cruiser SMS Kaiser Karl VI. Once again, the state of the Empire at this late stage of the war precluded laying down any such large river monitor. Dimensions: Displ: 2,000 tons; L: 80m/262ft 5in; B: 15m/49ft 3in; D: 2m/6ft 7in. Guns/ Armour: 2 × 24cm L/40; 4 × twin 9cm L/45 anti-balloon guns. Fate: Never begun, project only. Škoda 7cm L/50 gun on the LA mounting, planned for the secondary armament. The most powerful of the 7cm weapons, its shell case was the long 66x575 R. The giant Škoda 30.5cm L/12 siege howitzer planned for the 1915 monitor. (Tacom 35th scale model publicity shot) RIVER PATROL BOAT Patrouillenboot a Armed with an 8mm Salvator-Dormus MG and two spar torpedoes, and fitted with a funnel cowl. She could conceivably have carried a pair of launch cradles for 14in Whitehead torpedoes, but they would have greatly increased her draught and reduced the stability of this small craft. Launched: 1894 by Schichau, Elbing. Dimensions: Displ: 33 tons; L: 22m/72ft 2in; B: 3.5m/11ft 6in; D: 1.1m/3ft 7in. Power/Speed: Single screw; 2-cyl compound steam engine. Guns/ Armour: 1 × 8mm Salvator-Dormus Model 1893 MG; 2 × spar torpedoes/ Bulletproof conning tower. Patrouillenboot a. (Drawing by László Benczúr) Patrouillenboot b As Patrouillenboot a had not met expectations, a larger PB was ordered from Danubius, powered by internal combustion engines rather than steam. In company with the monitors Temes and Körös and the minesweeper Andor, Patrouillenboot b broke through the Serbian mine barrage and entered the Sava River under

heavy shellfire, on 28 September 1914. Patrouillenboot b was paid off in 1915. Launched: 1906 by Danubius Schönichen- Hartmann, Budapest. Dimensions: Displ: 36.5 tons; L: 28m/91ft 10in; B: 4.4m/14ft 5in; D: 0.4m/1ft 4in. Power/Speed: Twin screws; 4-cyl internal combustion engines. Guns/Armour: 1 × 37mm Hotchkiss Model 1885 QF; 2 × 8mm Salvator-Dormus Model 1893 MG/Bulletproof conning tower, MG turrets and crow's nest. Fate: Stricken 23 August 1915. Patrouillenboot b. (Drawing by László Benczúr) With the local beauties perhaps expecting a cruise on the river. Patrouillenboot c and d Patrouillenboot c was scuttled at Pancsova on 9 September 1914. Patrouillenboot d was sunk by Serb artillery at Belgrade on 15 May 1915, showing the vulnerability of these small craft to artillery fire. Launched: 1909 by private yard, Lustenau, Bodensee. Dimensions: Displ: 39 tons; L: 30m/98ft 5in; B: 4.4m/14ft 5in; D: 0.7m/1ft 4in. Power/Speed: Twin screws; 4-cyl internal combustion engine. Guns/Armour: 1 × 8mm Salvator-Dormus Model 1893 MG/Bulletproof conning tower, MG turret and crow's nest. Fate: c scuttled 9 September 1914; d sunk 15 May 1915. Patrouillenboot c and d. (Drawing by László Benczúr) Patrouillenboot e and f Patrouillenboot f was renamed Stör (I) in December 1916. She was transferred to the Adriatic Lagoon Flotilla 'Acquaeduct' in mid-March 1917, and served there as PM 1 (Panzer Motorboot = Armoured Motor Boat). There is no note of her ultimate fate but it is probable she was taken over by the Italians in 1920. Launched: 1908–9 by Yarrow, Glasgow. Dimensions: Displ: 12 tons; L: 18m/59ft; B: 2.7m/8ft 10in; D: 0.4m/1ft 4in. Power/Speed: Triple screws; 5 × petrol engines. Guns/Armour: Both: 1 × 8mm MG; Stör: + 1 × 37mm Hotchkiss Model 1885 QF/Bulletproof shield protecting the wheel and crow's nest; Stör: MG turret. Fate: e sold 1913; f as Stör (I) to Italians 1920? Stör (I). Right: Patrouillenboot g and h. (Drawings by László Benczúr) Patrouillenboot e, showing the distinctive lines of the Yarrow motor boat, and the stern flap to prevent the boat from sitting down at speed. Ordered in 1908/1909 from the yard in Glasgow, the high operating costs led to her being sold to a private buyer in 1913. Patrouillenboot g and h Yarrow-type Patrouillenboot g was built by Danubius in 1909. She was scuttled at Pancsova on 10 September 1914. Her sister Patrouillenboot h was renamed Lachs in December 1916 and transferred with Patrouillenboot f to the Adriatic Lagoon Flotilla 'Acquaeduct' in mid-March 1917, where she served as PM 2. Once again, her ultimate fate is not known, but as with PM 1 she probably became Italian in 1920. Launched: 1909 by Danubius, Budapest. Dimensions: Displ: 12 tons; L: 18m/59ft; B: 2.7m/8ft 10in; D: 0.4m/1ft 4in. Power/Speed: Triple screws; 5 × petrol engines. Guns/Armour: 1 × 37mm Hotchkiss Model 1885 QF; 2 × 8mm MG/Bulletproof shield protecting the wheel; armoured conning tower, MG turret and crow's nest. Fate: g scuttled 10 September 1914; h as Lachs to Italians 1920? Patrouillenboot h. 60-ton Patrouillenboot The Navy budget of 1914/15 allocated funds for two 60-ton and four 120-ton patrol boats. The smaller 60-ton boats i and k were built within a year at the DDSG shipyard at Budapest which had had no work on private orders since the outbreak of the war. Before the vessels were launched it was decided to name the patrol vessels after fish found in the Danube. 60-ton Patrouillenboot. (Drawing by Erwin Sieche) Fogas ('Pike-perch'). Note the scale provided by the crewmen, otherwise these 'miniature destroyers' are hard to size from a plan

alone. Here she shows off her two Danube-type anchors. Csuka ('pike'). The armoured shelter in front of the mainmast protects the auxiliary steering position. The forward mast and crow's nest can telescope downwards and the rear mast pivots between brackets, to pass under bridges. Patrouillenboot i was commissioned in December 1915, and in 1916 took the name Fogas (Hungarian for 'pike-perch'). In April 1920 she was transferred to the Austrian Army's Pioneer Corps, under her original name. For her subsequent service, see AUSTRIA Post-1918. Patrouillenboot k was commissioned in March 1916 as Csuka (Hungarian for 'pike'). In 1920 she was ceded to Hungary, under the name Siófok. For her subsequent service, see HUNGARY. Launched: Late 1915 (Fogas), early 1916 (Csuka), by DDSG Shipyard, Budapest. Dimensions: Displ: 60 tons; L: 36m/118ft 1in; B: 4.6m/15ft 1in; D: 0.9m/2ft 11in. Crew: 27. Power/Speed: Twin screws; 2 × 400ihp VTE steam engines/12 knots. Guns/ Armour: 1 × 66mm L/30 K.09; 2 × 8mm MG/Hull 5mm; Deck 4mm; Turret 5mm; Conning tower 5mm. Fate: Fogas transferred to Austria 15 April 1920; Csuka ceded to Hungary 1920. 120-ton Class The larger 120-ton boats, l, m, n, and o, were built within one year by Ganz & Co. Danubius Maschinen- Waggon- und Schiffbau A.G., Budapest and commissioned on 14 March, 28 March and 28 April 1916 respectively. They were allocated the following fish names: l became Wels ('Cat-fish'), m became Barsch ('Perch'), n became Compó ('Tench') and o Viza ('Sterlet'). In December 1918, Wels and Barsch were interned at Beograd, and in January 1919 the Yugoslavs briefly commissioned them as Bregalnica and Neretva respectively. However, with the redistribution of the ex-Austro-Hungarian vessels, on 15 April 1920 Wels and Viza were allocated to Hungary as Szeged and Kecskemét respectively. In addition, Compó, which had been allocated to Austria, was never re-commissioned, and was later sold to Hungary and renamed Györ. For their subsequent service, see HUNGARY. At the same time in 1920 Barsch was allocated to Austria and re-commissioned under her original name. For her subsequent service, see AUSTRIA Post-1918. Launched: Late 1915 and early 1916, by Ganz & Danubius, Budapest. Dimensions: Displ: 129 tons (133 tons full load); L: 44m/144ft 4in; B: 6m/19ft 8in; D: 1m/3ft 3in. Crew: 27. Power/Speed: Twin screws; 2 × 600shp AEG geared steam turbines/15 knots (up to 18.5 knots on trials). Guns/ Armour: 2 × twin 66mm L/26; 4 × 8mm MG/Hull 8mm; Deck 6mm; Turret 5mm; Conning tower 5mm. Fate: Transferred as above details. Three more 120-ton boats were ordered from Ganz & Co. Danubius but were not completed until 1918. They were larger, with a dual-purpose armament. Boats p and q were named Stör (II) ('sturgeon') and Lachs (II) ('salmon'). Patrouillenboot r was launched in 1918 but never commissioned and was broken up in Hungary. In January 1919 Stör and Lachs were commissioned by Hungary as Komárom and Pozsony respectively, but in 1920 Stör was officially allocated to Austria and re-commissioned under her original name. For Pozsony, see HUNGARY; for Stör, see AUSTRIA Post-1918. 120-ton class. (Drawing by László Benczúr) Launched: 1918 by Ganz & Danubius, Budapest. Dimensions: Displ: 129 tons (140 tons full load); L: 45.5m/149ft 3in; B: 6m/19ft 8in; D: 1m/3ft 3in. Crew: 42. Power/Speed: Twin screws; 2 × 700shp AEG geared steam turbines/16 knots. Guns/ Armour: Stör and Lachs: 2 × 75mm L/30 K 16 DP guns; 6 × 8mm MG.

Patrouillenboot r: 2 × 9cm L/45 DP guns; 6 × 8mm MG/Hull 10mm; Deck 6mm: Turret 5mm; conning tower 10mm.Fate:Stör to Austria; Lachs to Hungary; r broken up after the war.Compó (Hungarian for 'Tench'). Once more, in the absence of crewmen in a photo to give an idea of scale, one could easily mistake these river patrol gunboats for small destroyers.The twin 66mm L/26 gun mounting which armed the four patrol boats of the Wels class. Although still compact, they were somewhat more spacious than the sternmost cupola on Bosna and Sava. (Drawing by László Benczúr)The new dual-purpose single turret designed for 'p' and 'q', armed with a 7.5cm L/30 Škoda gun.Stör (II). (Drawing by László Benczúr)(Plans of Linz courtesy of Erwin Sieche)LinzIn 1914 and 1915, an armoured motor boat, Linz, operated on the Lakes and River Flotilla, armed with a 7cm L/42 and three MGs. Also, for the FMK armed riverboats, see GERMANY, Danube.ARMED STEAMERSWith such a large expanse of the Danube and its tributaries to patrol, it was only to be expected that the purpose-built monitors and patrol boats should be backed by an extensive flotilla of requisitioned and armed river steamers. The vessels included the Artur, Balaton, Dunajec, Goplana, Kopernic, Krakow, Kraus, Krystina, Kujawiak, Melsztyn, Nadwislanin, Neptun, Planeta, Polonez, Przyjacieli Publiki, Pulawy, Samson, Steinkeller, Tyniec, Una, Wanda, Wawel (A), Wawel (B) and Wenera. Many of these can be found on the Website of .On the right is the ex-DDSG steamer Una (227 tons; length 54m/177ft). She survives at the time of writing as the Zupa, and is awaiting restoration at Belgrade. On the left is Inn with the telescopic lattice mast lowered.Ex-DDSG steamer Samson, fitted out as a river gunboat (467 tons; length 62m/203ft 5in). Note how her deck curves downward at bow and stern similar to the arrangement pioneered on Maros and Leitha, and for the same reasons. From the drawing she is armed with two 7cm L/42 on the upper deck and two 7cm L/18 at bow and stern, no doubt supplemented by several 8mm Schwarzlose MG. (Drawing by László Benczúr)The following are a selection of photos and plans:Samson. Tied up alongside is the Russian Danube submarine S-3, captured at Reni on 3 March 1918.Balaton, another steamer with curved deck line (displacement 225 tons, length 55m/180ft 5in), armed with two 7cm L/42 plus a 8mm Schwarzlose MG on the upper deck and two 7cm L/18, at bow and stern. (Drawing by László Benczúr)Bascka and BájaThese two small river tugs, 80 tons displacement and 21.5m (70ft 6in) long, were quite well-armed for their size, and the wheelhouse was armoured. Note the funnel is able to pivot rearwards to pass under bridges, and it also acts as a mast for radio aeri-als. Bascka was sunk by a mine in July 1919. (Drawing by László Benczúr)Bája, showing her forward 7cm L/18 Škoda QF cannon. Behind the shield on the wheelhouse roof is an 8mm MG, probably a Salvator-Dormus Model 1893.VISTULA FLOTILLAThe Austro-Hungarian Navy had planned the formation of a Vistula Flotilla as early as 1889, with the paddle steamers Wawel and Krakow. In 1897 they commissioned the paddle tug Krystina, the passenger steamer Dunajec and the two small paddle steamers Wilga and Iskra. In 1910 the Zieleniewsky Works in Krakau launched the Melsztyn, Wanda, Kopernik and Tyniec. With the Balkan crisis of 1912, in November of that year the river steamers began to be armed: Wawel received four 37mm Hotchkiss and two 8mm MG, Wanda, Melsztyn and Kopernik two 37mm



and two 8mm MG, and Dunajec and Tynieć received just a pair of 8mm MG each. In addition, steps were taken to add bulletproof protection: 8mm around the machinery spaces, and 5mm on the deck and conning tower. Other steamers added up to thirty sandbags plus two MG on tripods. The Vistula Flotilla was put on a war footing on 30 July 1914, to protect Austro-Hungarian shipping from Russian attacks, operating from bases in Austrian Galicia. In addition to the Austro-Hungarian vessels, the German Volunteer Motorboat Corps, or FMK, was sent to the Vistula by the German Army. For details, see GERMANY. After the Russian Army had been expelled from Poland, in 1915 the Flotilla extended its zone of operations further to the North, escorting tugs and barges carrying supplies for Austro-Hungarian and German forces operating to the east of the River. In March 1916 the Flotilla was increased by the arrival of seven armed motorboats: Alpha, Gamma, Dora, Ida, Cb der Enns, Hedwig and Gott mit uns. Their numbers were swelled by the inclusion of two captured Serbian vessels Save and Danubius.

**Wawel** Profile of Wawel. (Drawn by Herbert Winkler, in *Marine - Gestern, Heute*, 1975 Vol 2) Krystina Krystina, with white hull and buff upperworks, with her funnel and mast folded down to pass under the bridge on which the photographer is standing. (Photo from Website) The armament fitted on the stern of Krystina: two 37mm Model 1885 single-barrelled Hotchkiss Model 1885 QF guns, with an 8mm Schwarzlose MG mounted between them, giving formidable firepower to such a small vessel. (Photo courtesy of ) Profile of Krystina, powered by a 150ihp steam engine, and drawing 0.65m/2ft 1½in. Armed with four 37mm Hotchkiss QF and two 8mm MG. (Drawn by Herbert Winkler, in *Marine - Gestern, Heute*, 1975 Vol 2) Dunajec Dunajec seen from a bridge. She appears here to be armed with two 37mm Hotchkiss Model 1885 QF. (Photo courtesy of ) Melsztyn, Wanda and Kopernik Launched: 1910 by Zieleniewsky Works in Krakau. Dimensions: Displ: 510 tons; L: 38m/124ft 8in; B: 4.7m/15ft 5in; 8.8m/28ft 10½in over paddleboxes; D: 0.54m/1ft 9in. Power/Speed: Side paddle wheels; Steam engines 108ihp. Guns/ Armour: 2 × 37mm Hotchkiss Model 1885 QF; 2 × 8mm MG/ Machinery spaces 8mm; Deck and Conning tower 5mm. The double-enders built for the K.u.K. in 1910. Note their sloping deck profile and the rudders fore and aft. (Drawn by Herbert Winkler, in *Marine - Gestern, Heute*, 1975 Vol 2) Nadwislanin Profile of Nadwislanin, powered by a 120ihp steam engine, and drawing 0.50m/1ft 7¾in. Armed with two 37mm Hotchkiss QF and two 8mm MG. (Drawn by Herbert Winkler, in *Marine - Gestern, Heute*, 1975 Vol 2) Polonez (100ihp, draught 0.70m/2ft 3½in), Goplana (50ihp, draught 0.75m/2ft 9½in) and Neptun (60ihp, draught 0.55m/1ft 9½in).

**POSTSCRIPT** During the last days of the First World War all surviving floating and operable units of the K.u.K. Donauflotille returned to their base barracks at Óbuda, a suburb of Budapest. There, on 6 November 1918, they were ceremonially paid off. The vessels were disarmed under the supervision of the Allied Control Commissions which operated in both Austria and Hungary. Thus ended a century-old branch of the Austro-Hungarian armed forces. On the eightieth anniversary, 6 November 1998, to celebrate their proud heritage, the Hungarians held a commemorative ceremony in front of the former Barracks of the Donauflotille. During the ceremony two commemorative plaques were unveiled.

**AUSTRIA-**

HUNGARYAUSTRIA-HUNGARYIt is all too easy to dismiss the Austro-Hungarian Empire for its role in starting the First World War and its calamitous collapse at the end of that conflict. Apart from major contributions to art, music, ballet and architecture up to and during the Belle Époque, a visit to the entrance hall of the Vienna Army Museum will reveal the statues of the numerous Austrian marshals and generals who for centuries defended Central Europe against the expansion of the Ottoman Empire. In the nineteenth and early twentieth centuries, Austrians were at the forefront of technical innovation. Robert Whitehead's first successful automotive torpedo was developed for the Austrian Navy. Dr Porsche's petrol-electric Landwehrzug all-wheel-drive artillery train was a sensation in 1912, the oceanographic exploration submersible Loligo was launched at Rijeka in 1913, and giant Škoda siege howitzers helped crush fortifications across Europe in 1914. At sea the Austro-Hungarian Navy were the first to launch dreadnoughts armed with triple turrets. On the Danube, for centuries the Austrians, then the Austro-Hungarian Dual Monarchy and Empire, had maintained extensive flotillas of sail and oar-powered gunboats, blocking the river to Turkish encroachment. On Lake Garda, an Austrian flotilla had secured control of the lake during the Second and Third Wars of Italian Independence. The Austrians were the first to build modern armoured river gunboats of what would become the classic model, inspired by the USS Monitor. In fact their designs were so successful that one of the very first, the Leitha, has been fully restored to virtually her condition of 1873 as a museum ship, and at the time of writing at least one other example, the hulk of the Bodrog, still exists in Serbia, awaiting restoration in her turn. The introduction of the Maros class inspired the Germans to produce the Rhein and Mosel, and the existence of the Austro-Hungarian monitors almost certainly influenced the later Russian river monitor classes. Developments would include high-angle howitzers carried to fire over high river banks and nearby hills and into trench systems, controlled from armoured crows' nests on telescoping masts. To pass under the Danube bridges, the masts would hinge at the base to fold flat. Later vessels had elaborate lattice masts which also telescoped and folded down. As rivers are relatively easy to blockade with mines, the Austro-Hungarian vessels could be fitted with complex mine rakes on the bows. Despite this, two of the monitors would fall victim to mines during the First World War. Once again, Austro-Hungarian technical skills would bring the lost vessels back into service relatively quickly. The two 'Danube Dreadnoughts', laid down but never completed, would have been tough opponents for all other river gunboats of the era. Projects for two even larger vessels were drawn up, but the design skills of the engineers were undermined by the collapse of the Empire during the Great War, and the later vessels would never be begun. To support the river monitors the Austrians also built a series of armoured river patrol boats, of which several would be deleted before and during the war. The initial classes of small vessels were adequate for patrol and policing duties, but were too vulnerable to modern artillery fire. However, the last 120-ton design was extremely successful and long-lived. This class would form the inspiration for the Czechoslovak President Masaryk. With the collapse of the Dual Monarchy in November 1918, most of the river monitors and patrol boats were divided up

between various countries in the revised Europe of the post-war period. Their later developments can be traced under the individual country chapters. The European Danube Commission took over three of the oldest monitors, Leitha, Maros and Szamos, which were disarmed to be used as pontoons, and thanks to this Leitha was saved to be fully restored as a museum ship.

**Acknowledgements:** All photos and plans in this chapter, apart from those taken from the official archives or marked otherwise, are courtesy of Erwin Sieche, many coming from his personal collection.

**LAGOON GUNBOATS**  
**LAGOON GUNBOATS**

Analogous to river gunboats are many of the lake gunboats, such as those described in the following section, but the Austrian Navy also ordered special gunboats designed to operate withing the lagoon surrounding Venice. They were side-wheel paddle steamers, with the hull cut away at the stern to allow a clear field of fire for the large muzzle-loading guns. From the following photos and plan it is clear that they would not be able to operate on the open sea. They preceded the RN Rendel 'Flatiron' coast defence gunboats by some twelve years. By comparison the Rendel types were generally much larger, with the gun firing forward and aimed by manoeuvring the ship, as it could elevate but not traverse. The twin-screw Rendels could cross open stretches of water by lowering the gun by means of a hydraulic mechanism, which lowered the centre of gravity of the ship and improved stability. However, whenever a Rendel was required to voyage any distance from its base, for example to carry out shore bombardment, it would usually be towed by a larger vessel. The two vessels on the left and the third of the same type in the centre background are Austrian lagoon gunboats Nos II, III and VI seen at Venice between 1855 and 1866. A rear view of lagoon gunboat No I at Venice between 1855 and 1866. At this time the armament was a 48-pounder muzzle-loader. Note the extreme cutaway stern section to allow the large gun to traverse.

**Lagoon gunboat profile.** (Drawing courtesy of Karl Klaus Körner)

Six lagoon gunboats were built, and when Venetia was ceded to Italy in October 1866 they were sold to the Italian Navy for 20,000 florins. The Austrians could very well have evacuated them along with the naval base contents and the rest of the fleet, but these gunboats were so specialised that they were probably thought unfit for any other duty, and in any case they would probably have had to be dismantled for sea transport. Then just five years later the Austrians decided to start building monitors for the Danube. For the lagoon gunboats' later configuration, see ITALY.

**Launched:** 1855, by J Ruston, Vienna/Florisdorf. Sent in parts to Venice and reassembled by Guidecca.

**Dimensions:** Displ: 75 tons; L: 30.5m/100ft; B: 5.18m/17ft; D: 0.9m/2ft 11in.

**Crew:** 29–32.

**Power/Speed:** Side paddle wheels; steam engine, 25 nominal hp/8 knots.

**Guns/Armour:** 1 × 48-pounder iron SB; 1 × 7-pounder bronze SB howitzer Model 1842.

**Fate:** Sold to Italy October 1866.

**LAKE GARDA FLOTILLA**

A little-known aspect of the Austrian Navy was its presence on Lake Garda during the wars of Italian unification. In June 1859 the Hess and Franz Joseph, plus the Benaco, took part in the Second War of Italian Independence. The Benaco was lost on 20 June when she was sunk by a Piedmontese field gun battery at Salo. The lack of any French and Piedmontese naval units meant that the Austrians had complete dominance of the

Lake. During the Third War of Italian Independence which began in June 1866, the Hess and Franz Joseph with six modern screw-driven gunboats – Wildfang, Raufbold, Wespe, Uskoke, Scharfschütze and Speiteufel – faced the five Italian gunboats supplied by France plus two Italian-built steamers Solferino and Saint Martino, along with Benaco, which the Austrians recaptured on 19 July in Gargano. With the end of the war, Lake Garda was ceded to Italy, except for a small strip of shoreline around Riva del Garda. The Austrian flotilla was dissolved and the vessels were sold to their former enemies for the sum of one million florins.

**Gunboat Franz Joseph on Lake Garda.** When sold to Italy she was renamed San Marco, and was used as a passenger steamer. (Photo from Ogliari, Francesco: *La navigazione sui laghi italiani – Lago di Garda*, Milan : Cavallotti, 1987)

**Hess**  
**Launched:** Launched: As Hess May 1852, by Escher Wyss, Zurich, assembled by Riva del Garda shipyard. Wooden hull.  
**Dimensions:** Dimensions: Displ: 360 tons; L: 45.4m/149ft; B: 5.5m/18ft; D: 1.5m/4ft 11in.  
**Crew:** Crew: 55.  
**Power/Speed:** Power/Speed: Side paddle wheels; steam engine, 100ihp; brigantine rig.  
**Guns/Armour:** Guns/Armour: 2 × 18-pounder MLR; 2 × 7-pounder bronze SB howitzers Model 1842. In Italian service as gunboat: 2 × 12-pounder MLR; 1 × 3-pounder howitzer.  
**Fate:** Fate: Sold to Italy 2 December 1866 as Prince Oddone. Passenger steamer 1867. Scrapped 1890.

**YANGTZE EXPEDITION**  
**YANGTZE EXPEDITION**  
 The Austro-Hungarian Navy were participants in the exploration of China's rivers. In 1890–1 the iron corvette SMS Zrinyi (launched 10 December 1870 by the Stabilimento Tecnico Triestino), explored the Yangtze River as far upstream as Nanking (Nanjing) and Hankow. Her crew sketched and mapped the river banks and took especial notice of the fortifications on both banks. Their work was useful during the fighting in the Boxer Uprising a decade later.

**Ex-Austrian Hess as Italian Prince Oddone.** (Painting by D Cavarrone, in the Genoa Naval Museum)

**RIVER MONITORS**  
**RIVER MONITORS**  
 All the Austro-Hungarian river monitors were named after tributaries of the Danube. Maros and Leitha

Although the American armoured vessels derived from the original Monitor were far from safe on the open seas, they performed well enough in the confines of river systems, where their low freeboard made for a small target, and their cylindrical Coles-style turret allowed for virtually all-round fire from just two guns. Following the Crimean War, Turkey ordered five armoured gunboats of the Feth-ül-Islam class from France, and their appearance on the lower Danube from 1865 onward spurred the Austrians into responding. It was decided to build two armoured monitor-style gunboats, to be designed by the experienced K.u.K. Naval Architect-Inspector Josef Ritter von Romako. He would produce a design inspired by the USS Monitor type but incorporating several innovations. The most obvious new feature was the downward curve of the armoured deck at the bow and stern. This arrangement reduced the weights at both ends and contributed to the shallow draught of the vessels. Interestingly, in Britain Yarrow would be taking the opposite view as regards the stern of their river vessels, building a flat, wide stern to spread the weight. Yarrow's version did, however, require placing the screws in tunnels which Romako avoided, the hull being cut away aft for the screws. Previous steam engines were slow-turning low-pressure types, usually employing a single large horizontal cylinder. For his new river monitors, Romako

fitted a pair of 2-cylinder vertical engines turning at relatively high speed. This allowed him to use smaller propellers, essential given the vessels' shallow draught. The riveted hulls were made of iron which in the case of Leitha has lasted for almost a century and a half. For the first time Bessemer steel was used for the armour, a 25mm layer being placed directly on the deck, and 44mm of vertical hull armour was fixed to 203mm of teak backing. The turret and conning tower had 50mm armour. In 1871, to protect against attacks by spar torpedoes, and particularly in view of the recent Austrian adoption of Whitehead's locomotive torpedo, thought was given to providing the monitors with a comprehensive anti-torpedo net protection, which would be hung at a distance from the hull on booms hinged vertically at the deck edge. Such an arrangement would have added substantial weight on a hull where shallow draught was essential, and the danger of part of the net coming adrift after battle damage or by snagging on a river obstacle, and entangling the screws or the rudder, meant it was quickly forgotten. For the later anti-mine protection, see below.

Profile of the Maros class as originally built in 1871. Note the conning tower built on top of the turret, as used on many early monitor designs. This arrangement was copied by the Germans on Rhein and Mosel. Not shown are the two spars mounted one each side of the bows for spar torpedoes, copying contemporary Turkish river monitors which used spar torpedoes at bow and stern as defence against enemy spar torpedo boats. There was originally no foremast, just a large flagpole on the conning tower. The structures on the foredeck are WC boxes (the 'heads'). The galley is the box with a chimney in front of the funnel. An early modification was the addition of a spark-arrestor on the funnel, to avoid starting forest fires on the banks of narrow waterways. This was soon removed and would not be copied on subsequent designs. During the 1873 refit the flagpole on the conning tower was removed and replaced by a foremast in front of the WC boxes. Another innovative feature was the addition of flushing toilets, in the boxes on the deck forward, which were among the very first of their kind on-board ship. They have been faithfully reproduced on the reconstructed Leitha, as later repositioned on either side behind the funnel.

Laid down in 1870 at Pest Flumaner Schiffbau AG in Budapest, both monitors were accepted into service in 1872. They first went into action during the Austro-Hungarian occupation of Bosnia-Herzegovina in September 1878, when they provided fire support to troops on the banks of the River Sava. Modern replicas of the two 15cm System Wahrendorf breech-loading guns originally mounted in each of the Coles-type turrets on Maros and Leitha in 1871. The turret crew numbered sixteen men, and a further ten ammunition handlers worked in the magazine below the turret, handing up charges. The guns used separate loading of shell and silk propellant bag, and could achieve a rate of fire of between four and six rounds a minute. The turret was rotated by hand, and for large degrees of training the whole ship was turned towards the target. (Photographed inside the replica turret on the reconstructed Leitha).

Specifications as built 1870–1  
Launched: Launched: Maros: April 1871; Leitha: May 1871, by Pest Flumaner Schiffbau AG, Budapest.  
Dimensions: Dimensions: Displ: 310 tons; L: 49.98m/164ft; B: 8.12m/26ft 7in; D: 1.07m/3ft 6in.  
Crew: Crew: 50. Power/Speed: Power/Speed: Twin screws; 2 × 350ihp 2-cyl vertical steam engines/8.3 knots.  
Guns/Armour: Guns/

Armour: 2 × 15cm L/21 Wahrendorf BL; + from 1878: 2 × 25mm Palmkrantz manually-operated HMG/Deck 25mm (Maros), 19mm (Leitha); Hull 44mm on 203mm teak backing; Turret 51mm front, 44mm sides and rear; Conning tower 64mm. Fate: Rebuilt 1893–4. The original pair of monitors had been in service for over twenty years, and in reserve for several more, when it was decided to build a new pair, which would become the Körös and Szamos. At the same time as they were building, the improvements incorporated in the new pair were incorporated in the Maros and Leitha, giving them a new lease of life, and providing the Danube Flotilla with a quartet of monitors sharing common armament and similar performance. Their old engines were replaced by a pair of vertical triple expansion engines of greater power, raising their maximum speed to match that of the new monitors. The old twin turret and Wahrendorf guns were removed, and replaced by a new cylindrical turret mounting a single Škoda 12cm L/35 gun, the same as in the newer monitors. A new bulletproof citadel was installed, and a new oval-shaped conning tower was fitted behind the turret, with an 8mm Salvator-Dormus MG in a shield mounted on top. On each side of the funnel, the old 25mm Palmkrantz MG were replaced by a pair of 47mm Hotchkiss revolver cannons with a cyclic rate of fire of forty rounds a minute, providing a much improved defence against torpedo boats. During the Great War this armament would be further modified, as shown in the following drawings: Leitha would receive a 7cm L/42 gun in a large shielded mounting at the stern, a short-barrelled 7cm L/18 gun would be mounted to the rear of the superstructure, and two tall cylindrical MG turrets would be installed, each armed with an 8mm Schwarzlose. 25mm Palmkrantz four-barrelled manually-operated MG. In 1881 it was proposed to fit two mountings, one behind the pair of WC boxes on the forward deck, and one near the stern. These mountings were given more command by placing them on either side of the funnel on a platform deck, supported by the boxes for the heads which were moved from the foredeck to either side behind the funnel. The complete gun weighed 300kg, and the magazine held a total of thirty-two rounds, eight for each barrel. The cyclic rate of fire was over ninety rounds a minute. Maros would be rearmed with a total of three 7cm L/18 guns, all in shielded mounts, two of which replaced the 47mm Hotchkiss. The rebuilt Maros on the Danube in about 1900. At that time she was armed with a single modern Škoda 12cm L/35 turret gun, a pair of 47mm Hotchkiss revolver cannons mounted port and starboard behind the funnel, in place of the 25mm Palmkrantz, and a shielded 8mm Salvator-Dormus Model 1893 MG on top of the new conning tower. Two spars were carried on board, as mooring poles (Schorbaum) to distance the vessel from a sloping riverbank. Maros as rebuilt 1893–4, with a central superstructure and modern armament. The drawing shows her with the three 7cm L/18 guns fitted as secondary armament during the Great War. One has replaced the 8mm MG on the conning tower, and the rear pair are situated on top of the repositioned WC boxes, and replace the earlier Palmkrantz MG and Hotchkiss revolver cannons. (Drawing by Erwin Sieche) The replacement turret fitted to Maros and Leitha mounting a single 12cm L/35 Škoda gun. Two identical turrets and Škoda guns were also fitted to Szamos. As the conflict progressed both monitors would also carry a pair of 37mm Pom-Poms to subdue small-arms fire from the river

banks. With the planned introduction of Monitors VII and VIII in 1914, both Maros and Leitha were due to be deleted. However, with the imminent outbreak of war both were retained, and the old ships saw considerable action. At first part of the Sava River monitor group based at Breko, they provided fire support to the Austro-Hungarian army. In late September 1914, on forcing the entry to the Sava River, Leitha received a hit on her turret: the gun crew were killed and the guns put out of action. She was repaired at the Slavonic-Mitroviča yard. Then in October 1915 they joined the other monitors in the attack on the Serb capital of Belgrade, fighting duels with Serb and Allied artillery. Between December 1915 and August 1916 both monitors remained at Ruschuk. Then Leitha shelled Romanian oil and harbour installations at Giurgiou. Meanwhile, Maros guarded the Belene Channel. From the winter of 1916 up until the end of the war both ships were based on the river between Budapest and Orsova. In 1919 Leitha was renamed Lajta in Hungarian service, and fought the Czechs and Slovaks, before both monitors were handed over to Yugoslavia. They never entered service, being discarded in 1921. While Maros was scrapped, Leitha was sold into commercial service, and in 1928 became the elevator hulk József Lajo.

Specifications as rebuilt 1894  
Dimensions: Dimensions: Displ: 310 tons; L: 49.98m/164ft; B: 8.12m/26ft 7in; D: 1.07m/3ft 6in. Crew: Crew: 57. Power/Speed: Power/Speed: Twin screws; 2 × 600ihp 2-cyl VTE steam engines/10 knots. Guns/Armour: Guns/Armour: 1 × 12cm L/35; Secondary armament 1897: 2 × 47mm Hotchkiss revolver cannons; 1 × 8mm Salvator-Dormus MG. 1916: Maros: 3 × 7cm L/18; Leitha: 1 × 7cm L/42 + 1 × 7cm L/18 + 2 × 8mm Schwarzlose MG. Later 2 × 37mm Pom-Poms added on open mounts/Turrets 75mm front (3 × 25mm laminates), 50mm sides and rear (2 × 25mm laminates); Hull 44mm on 90mm teak backing; Deck 25mm (Maros), 19mm (Leitha); Conning tower 50mm (2 × 25mm laminates); Superstructure: bulletproof. Fate: Fate: Maros scrapped 1921; Lajta disarmed 1921, from 1928 used as elevator hulk; museum ship 2010.

In the 1970s Hungarian naval historian Dr. Károly Csonkaréti discovered the old ship, and with naval enthusiast Dr. András Margitay-Becht worked to try to preserve her. Leitha as rebuilt in 1893–4, with new superstructure and new guns, in a different layout to those on her sister. Again, the drawing shows her Great War configuration of 1915–18. (Drawing by Erwin Sieche) The 7cm L/42 gun mounted on the stern of the rebuilt Leitha. 7cm L/18 gun. The 37mm Vickers Pom-Pom fitted during the Great War to counter enemy small-arms fire. Salvator-Dormus Model 1893 delayed-blowback machine gun manufactured by Škoda. In view of its lightweight construction, and the curious arrangement whereby the rate of fire was controlled by adjusting the swinging pendulum exposed below the breech, it was rejected by the Army. However, it functioned well enough on fixed mountings in fortresses and on naval vessels. (Photo via Wikipedia) They had a difficult task, as the ex-Leitha consisted of simply an empty hull, lacking her internal partitions and watertight bulkheads, with no steering or mooring fittings, which prevented her legally from being moved. Her superstructure had gone, and new holes had been cut in the deck. The side armour had long disappeared. Despite all the problems, in 2005 she was hauled up on dry land for preservation, and by 2010 had undergone a complete transformation, restoring her to the state she was in when first commissioned. At the

time of writing, *Lajta* serves as the honorary flagship of the Hungarian Army's river warship regiment. Szamos and Körös

More than twenty years after the introduction of the *Maros* and *Leitha*, it was decided to build a second pair of river monitors for the Danube. Designer Josef Thiel took advantage of the developments since the launch of the original pair, and produced two miniature pre-dreadnoughts with a main gun turret fore and aft of a substantial superstructure, topped with an imposing funnel for forced draft, and numbers of smaller guns. Note that the class still retained the deck profile of *Maros* and *Leitha*, curving downwards at bow and stern. For the first time, the screws turned partly in shallow tunnels in the underneath of the hull. A full-scale wooden dummy of the *Maros* class built in the spring of 1915, intended to draw fire from hidden French and Serb batteries at Belgrade, thus exposing their positions. Unfortunately, details of the dummy were leaked and the ruse failed. *Lajta* as reconstructed as a museum ship in 2010 to her configuration in 1873. (Drawing by Dr Balagh Tarras)

The armoured conning tower was now circular, and separated from the main superstructure. A second cylindrical tower supported the gun mounting at the rear of the superstructure. Armour was now nickel-steel, increased to 50mm for the belt, backed by 90mm of teak, with 75mm on the turrets, 19mm on the deck, and 40mm on the conning tower. The remainder of the superstructure was built of bulletproof plating. The main guns were 12cm L/35 models, those on *Körös* being supplied by Krupp, and those on *Szamos* by Škoda, presumably to compare the two types. Significantly, no more Krupp guns were ordered. Each of the cylindrical structures carried a long 7cm gun, and a tall cylindrical turret amidships mounted an 8mm MG, initially a Salvator-Dormus model, with a second MG carried in the crow's nest. Both would later be replaced by the 8mm Schwarzlose.

*Körös* in pre-war livery. Her main armament guns were built by Krupp, whereas the guns on her sister were built by Škoda. *Szamos* in wartime livery. Note the semaphore device mounted above the bridge, and the raised forward bulwarks. Also the Škoda 12cm guns are mounted higher in the turret with a smaller embrasure than on *Körös*.

*Körös* during the First World War. (Drawing by Erwin Sieche)

The drawing shows the addition of the spotting top in the form of an armoured crow's nest. In photographs this is seen at different heights above the deck, because the masts were able to telescope to pass under river bridges. For the same reason the funnels hinged rearwards. Prominent at the bow was the now-standard Danube anchor in the form of a four-arm grapnel. As the moored or floating mine posed the greatest risk to these river monitors, an elaborate minesweeping rake structure could be deployed over the bows to catch and explode these deadly weapons. Below decks, Yarrow boilers supplied steam to two vertical triple expansion engines, built by Schichau in Elbing, giving a speed of 10 knots. They were built in 1891–2 by Schönichen & Hartmann at Budapest (*Körös* was originally to be named *Theiss*). Both vessels were active during the Great War. *Körös* engaged Serbian artillery within hours of the declaration of war, taking six direct hits on 4 August 1914. Both vessels participated in the breakthrough into the Save River in late September, and they featured in contemporary illustrations of the bombardment of Belgrade. On 28 August both were attacked unsuccessfully by three Romanian torpedo boats. The following day they shelled oil depots at Giurgiu and



shipping in Zimnicea. Körös took part in the operation to destroy the Romanian pontoon bridge at Rjahovo on 2 October 1916, in return taking twelve hits from Romanian artillery and suffering heavy damage. After Russia and Romania had been knocked out of the war, Körös and Szamos participated in the Black Sea cruise to Odessa by Flottenabteilung Wulff, and operated on the River Dnepr. Returning to the Danube, they covered the retreat of the Austro-Hungarian forces, and ended the war at Belene. In 1919 they were taken over by Hungary, and fought against the Czechs and Slovaks. Körös showing her mine rake. The cumbersome device could be lowered to attempt to catch moored and floating mines. Her crow's nest on its telescopic mast has been lowered. Both vessels were withdrawn from service in 1921, Szamos becoming crane pontoon FK 202, and Körös was handed over to the Yugoslavs. For her subsequent service, see YUGOSLAVIA. Launched: 1892 by Schönichen & Hartmann, Budapest. Dimensions: Displ: 448 tons; L: 54m/162ft 9in; B: 9m/25ft 9in; D: 1.2m/5ft 3in. Crew: 77. Power/Speed: Twin screws; 2 × 600ihp 3-cyl VTE steam engines/10 knots. Guns/Armour: 2 × 12cm L/35; 2 × 7cm L/42 QF; 2 × 8mm MG/Turrets 75mm front (3 × 25mm laminates), 50mm sides and rear (2 × 25mm laminates); Hull 40mm + 10mm on 90mm teak backing; Bulkheads 50mm; Deck 19mm; Conning tower 50mm. Fate: Körös to Yugoslavia as Morava; Szamos crane pontoon FK 202. Körös crewmen displaying pieces of a Romanian torpedo recovered after the unsuccessful attack on their monitor on 28 August 1914. Körös on an unknown date, having the Krupp gun in her aft turret removed/replaced, by the expedient of mooring under a railway (?) bridge. Note her 7cm L/42 on the stern which normally is mounted in the gun tub where the officer is standing, and her armoured crow's nest lowered. Both of the gun turrets on Körös were armed with Krupp 12cm L/35 C/89 guns on Krupp mountings. Note that because the gun pivots further back on the mounting, the embrasure is much larger than on the turrets with Škoda 12cm L/35 guns, as on her sister Szamos (and the rebuilt Maros and Leitha). The barrel is also set lower in the embrasure, which makes it easy to distinguish between the two sister-ships. Temes (I) and Bodrog Following the decision in the 1890s to build a pair of new monitors every ten years, the Temes class were constructed by the Danubius Schönichen-Hartmann AG Yard in Budapest, and launched in 1904. In this class the sloped deck arrangement of the previous four vessels was replaced by a more classic horizontal deck line. In order to double the ahead firepower, always an advantage in narrow river environments, Josef Thiel designed the class with the narrow 'tadpole'-shaped main turrets, the circular armoured conning tower being placed between them. Astern firepower was relegated to a single 12cm short-barrelled howitzer behind a minimal shield. The shield was later extended to give the gunners more protection. The great advantage of the howitzer was its ability to fire over high river banks, intervening hills, and into trenches, observed and corrected from the tall armoured crow's nest on the mast. The crew of Temes (I) coaling ship from a lighter. Note her name on the lifebelt, her twin wheels on the bridge, and an MG under a tarpaulin on the bridge wing. Temes (I) as in 1904. Note the mast can be pivoted down on the battery deck and the funnel can hinge rearwards to clear bridges. In her

original configuration Temes (I) could always be told apart from her sister Bodrog by her two large ventilator cowls at the rear of the battery deck. (Drawing by Erwin Sieche)The two turrets of Bodrog with the shielded 7cm L/18 gun above, photographed at Odessa. Note the slatted optical signalling device behind the gun shield, used to send messages in Morse. Above the bridge is a gun tub with an 8mm MG.The Škoda 12cm L/35 turrets fitted to Temes (I) and Bodrog. Note the severely restricted interior space.The 12cm L/10 howitzer mounted on the stern of both vessels, with its small shield.Bodrog fired the first shots of the Great War even before the official start of hostilities, capturing three Serbian boats at Zemun on 26 July 1914.Temes (I) was flagship of the Danube Flotilla from 1908 to 1914. She was an early victim of a Serbian mine, sinking on 23 October 1914 with thirty-one men killed and ten wounded. She was salvaged and rebuilt with two high-angle 9cm L/45 anti-balloon gun mountings replacing her single 12cm howitzer.Bodrog participated in the destruction of the pontoon bridge at Rjahovo on 2 October 1916.In April 1918 both monitors crossed the Black Sea to Odessa as part of Flottenabteilung Wulff. Retreating towards Budapest at the end of the war, on 31 October 1918 Bodrog grounded on a sandbank downstream from Belgrade, and was captured by Serb forces.In April 1920 Temes (I) was passed to Romania as the Ardeal. For her subsequent service, see ROMANIA. Bodrog was passed to Yugoslavia as the Sava. For her subsequent service, see YUGOSLAVIA.The wreck of Temes (I), sunk after hitting a Serb mine in the Sava River on 23 October 1914. Thirty-one crewmen lost their lives. The heavy loss of life and the extent of the damage confirms that she suffered a partial magazine explosion when the mine detonated in the region of the starboard 12cm turret. She was repaired in Budapest, and returned to service with a modernised secondary armament.4.7cm L/44 QF.Launched:Launched:Temes (I) 26 March 1904, Bodrog 12 April 1904, by Danubius Schönichen-Hartmann AG, Budapest.Dimensions:Dimensions:Displ: 440 tons; L: 56.2m/184ft 5in; B: 9.50m/31ft 2in; D: 1.2m/3ft 11in. Temes (I) rebuilt: Displ: 440 tons; L: 58.6m/192ft 3in; B: 9.56m/31ft 4in; D: 1.5m/4ft 11in.Crew:Crew:86.Power/Speed:Power/Speed:Twin screws; 2 × 700ihp 3-cyl VTE steam engines/17.8 knots. Temes (I) rebuilt: 16.9 knots.Guns/Armour:Guns/Armour:2 × 12cm L/35; 1 × 12cm L/10 howitzer; 2 × 37mm Hotchkiss revolver cannon, replaced 1913/1914 by 2 × 47mm L/44 QF; 1 × 8mm MG/Turrets 75mm front, 50mm sides, 40mm rear; Hull 40mm + 10mm on 90mm teak backing; Deck 19mm; Conning tower 50mm. Bodrog 1915: 2 × 47mm replaced by 1 × 7cm L/18 QF; MG increased to 2. Temes (I) 1917: 2 × 12cm L/35; 2 × 9cm L/45; 2 × 8mm MG.Fate:Fate:Bodrog to Yugoslavia; Temes (I) to Romania.The gunners manning the 12cm howitzer on the stern of Bodrog. Note how cramped the cupola is. (Photo courtesy of )One of the two 47mm L/44 QF guns on the battery deck of Bodrog. Note the very short recoil, indicated by the polished part of the barrel. (Photo courtesy of )Temes (I) firing her new 9cm guns. From the assembled guests on the left, including at least one lady, this may be her recommissioning ceremony.Temes (I) as re-commissioned on 23 April 1917. The drawing shows her reduced forward superstructure, and the 12cm howitzer aft replaced by two new 9cm guns with AA capability. She had been lengthened by 2.40m (7ft 10½in). Note the funnel hinging arrangement to pass under low bridges. (Drawing by Erwin

Sieche)9cm L/45 anti-balloon gun at full elevation. The mounting had a range of  $-3^{\circ}$  to  $+90^{\circ}$ . The fitting of two of these modern weapons gave the rebuilt Temes a powerful anti-aircraft capability for the time. Inn and EnnsA hundred tons larger than the preceding class, Inn and Enns carried a powerful armament. For the first time the main guns were mounted in a twin turret, which saved weight compared with the two single turrets on Temes and Bodrog. The single howitzer for high-angle fire was replaced by three of the same calibre, mounted in between-deck cupolas which gave all-round armour protection to the gunners, albeit at the expense of internal space. The anti-balloon function was fulfilled by two 47mm L/50 guns on the superstructure. The telescoping mast carrying an armoured crow's nest was now standardised. This had three sections which retracted one inside the other, following which the retracted mast could be folded down to lie flat to clear bridges. The funnel was also much lower than on the previous classes, for the same reason. Enns with folding pole masts in place of the lattice mast carried by her sister Inn. The class has the two-gun forward fire capability of Temes (I) and Bodrog, now mounted for the first time in a twin turret, with longer guns. Indirect fire capability was greatly increased by replacing the single shielded 12cm L/10 howitzer at the stern with three such weapons, mounted in armoured cupolas, countersunk into the rear deck. The tertiary armament now comprised two 47mm L/50 DP guns in large shields, mounted on the superstructure. (Drawing by Erwin Sieche) Enns completed in October 1914, and she soon undertook her first artillery duel with Serbian gunners defending Belgrade. She twice attacked the Flaminia pontoon bridge, then wintered on the Lower Danube at the close of 1917. Taken over in October 1918 by Hungary as the Drava, she was finally handed over to Yugoslavia as the Drava: for her subsequent service, see YUGOSLAVIA. Her sister-ship was completed in April 1915. On 22 September 1917 Inn struck one of five Serbian mines near Braila, and sank in 7m of water in five minutes. The Danube Flotilla's Chief of Staff, Korvettenkapitän von Förster, and one warrant officer were killed, and eight crewmen were injured. Salvaged between two barges in December 1917, she was repaired at Budapest and lengthened by 2.4m (7ft 10½in) by adding a block between ribs 15 and 19. In April 1919 she became the Hungarian Ujvidek, then under the Communist regime of Bela Kun she was renamed Marx. Finally, she was ceded to Romania as the Basarabia. For her subsequent service, see ROMANIA. Launched: Launched: 29 July 1914 (Enns) by Stabilimento Tecnico Triestino Werft, Linz; 25 February 1915 (Inn) by Ganz & Co, Budapest. Dimensions: Dimensions: Displ: 536 tons; L: 60.2m/197ft 6in; B: 10.5m/34ft 5in; D: 1.3m/4ft 3in. Inn rebuilt: Displ: Approx. 700 tons full load; L: 62.6m/205ft 5in; B: 10.5m/34ft 5in; D: 1.3m/4ft 3in. Crew: Crew: 86. Power/Speed: Power/Speed: Twin screws; 2 × 750ihp (Inn rebuilt: 2 × 780ihp) oil-fired 3-cyl VTE steam engines/17.8 knots Guns/Armour: Guns/Armour: 2 × 12cm L/45; 3 × 12cm L/10 howitzers; 2 × 47mm L/50 QF; 6 to 8 × 8mm MG/Turrets 75mm front, 50mm sides, 40mm rear; Hull 40mm + 10mm on 90mm teak backing; Deck 25mm; Conning tower 50mm front, 40mm rear, 2 × 10mm plates roof. Fate: Fate: Enns to Yugoslavia; Inn to Romania. Inn with telescopic foremast and armoured crow's nest. This type of mast was first tested on the Maros class. It telescoped downwards in three sections. As it was offset to starboard, the

telescoped mast could be folded backwards to lie alongside the funnel. Inn sunk in 7m of water. She struck a mine 14km (almost 9 miles) downriver from Braila on 22 September 1917. Three men were killed, two seriously injured and six suffered minor injuries. Salvage work on Inn began in October 1917. She arrived in Budapest for repairs in February 1918, and her bows were lengthened by 2.4m (7ft 10½in). Note her two 47mm L/50 DP mounts on the rear of the battery deck. The large shield has been removed from the mount on the left, and both barrels are missing, presumably to lighten the wreck. Also visible is her rear conning tower. Enns seen after suffering damage during the bombardment of Belgrade on 8 October 1915. She was hit below the waterline by a 138mm shell fired by the French battery on Topcider Hill. Here her pumps are in action to keep her afloat, and she safely reached Budapest for repairs. Twin 12cm L/45 gun turret. The French 138mm shell which fortunately did not explode. The 12cm magazine was flooded. Single 12cm L/10 howitzer in armoured cupola. Enns and Inn carried three of these cupolas on the rear deck, countersunk into the deck plating, providing a powerful indirect fire capability. Sava and Temes (II) (later renamed Bosna) Sava and Temes (II) followed the lines of Inn and Enns. It was originally planned to mount a second twin 12cm L/45 turret at the stern, but wartime shortages meant that the same three-cupola arrangement as on Enns and Inn was finally fitted. The rearmost of the three cupolas exchanged the short-barrelled howitzer for a pair of 7cm (actually 66mm) L/26 anti-balloon guns with +90° elevation. In September 1918 Sava entered a Romanian drydock in Galata, but with the general collapse in November she was withdrawn to Budapest. Given the Hungarian name Soca in January 1919, in April 1920 she was handed over to Romania as the Bucovina: for her subsequent service, see ROMANIA. When the original Temes was salvaged and rebuilt, in May 1917 Temes (II) was renamed Bosna. She was one of the monitors in Flottenabteilung Wulff, crossing the Black Sea to Odessa and operating on the Dnepr. In January 1919 she was handed over to Yugoslavia as the Vardar. For her subsequent service, see YUGOSLAVIA. Sava moored beside the walls of the fortress of Smederevo, built in 1428. Her lattice mainmast has been retracted. This mast proved too top-heavy, so finally Sava was rebuilt with a pole mainmast. Sava as built, with her telescopic mast, which folded forward once retracted. (Drawing by Erwin Sieche) Launched: Launched: 31 May 1915 (Sava), 20 June 1915 (Temes II) by Stabilimento Tecnico Triestino Werft, Linz. Dimensions: Dimensions: Displ: 600 tons; L: 61m/200ft 2in; B: 10.5m/34ft 5in; D: 1.3m/4ft 3in. Crew: Crew: 86. Power/Speed: Power/Speed: Twin screws; 2 × 800ihp oil-fired 3-cyl VTE steam engines/17.8 knots. Guns/Armour: Guns/Armour: 1 × twin 12cm L/45; 2 × 12cm L/10 howitzers; 1 × twin 7cm L/26 QF; 2 × 47mm L/50 DP guns; 6 × 8mm MG/Turrets 75mm front, 50mm sides, 40mm rear; Hull 40mm + 10mm on 90mm teak backing; Deck 25mm (2 × 12.5mm laminates); Conning tower 50mm front, 40mm rear, 45mm roof. Fate: Fate: Bosna to Yugoslavia; Sava to Romania. Bosna. Her masts pivoted to be able to pass under bridges. Note the three MG turrets on each side of the bridge. Temes (II), renamed as Bosna, without a telescopic mainmast. (Drawing by Erwin Sieche) A pair of Škoda 66mm L/26 guns (twin mounting number 266, probably from a Wels class patrol boat). These guns were formerly on display at the Budapest

Military Museum. (Photographed on 18 May 1986 by Erwin Sieche)The twin 66mm stern mounting with +90° elevation. The photo shows the cupola on Temes (II). (Photo from Website )Monitors XI and XIIThese powerful vessels were designed to replace the original Maros and Leitha. Voted in the 1916 Budget, they were laid down at the Linz shipyard, but the chaotic state of the Empire and material shortages meant that they were never completed. Monitors XI and XII were broken up on the slips shortly after the end of the war. If they had entered service they would have proved to be formidable river combat ships. Their two large turret guns would have been useful for shore bombardment, and their secondary armament of no less than five 9cm DPguns could have fended off Allied air attacks of the later war period. For the first time, the monitor design included a double bottom, as an increased insurance against mines and grounding damage. Also, the anti-mine and torpedo bulkhead protection, added to their greatly increased size and beam, would have enhanced their survivability – except, perhaps, in the case of a strike in the region of one of the wing turret magazines, as had occurred with Temes. The British ‘Insect’ class had been designed to out-gun the existing Danube monitors in the early years of the war. They would have had great difficulty opposing Monitors XI and XII.Launched:Launched:Laid down at Stabilimento Tecnico Triestino Werft, Linz.Dimensions:Dimensions:Displ: 1,265 tons; L: 76m/249ft 4in; B: 13m/42ft 8in; D: 2m/6ft 7in.Power/Speed:Power/Speed:Twin screws.Guns/Armour:Guns/Armour:2 × 19cm L/35; 2 × twin and 1 × single 9cm L/45 anti-balloon guns; 2 × 47mm L/33 QF; 4 × 8mm MG/Hull 75mm; Anti-mine and torpedo bulkheads 20mm; Deck 30mm slopes, 17mm flat; Double bottom.Fate:Fate:Never completed; scrapped after the war.The proposed appearance of Monitors XI and XII if they had been completed. As they were designated ‘Ersatz Maros’ and ‘Ersatz Leitha’ it is possible they would have taken up the names of the very first monitors when these were withdrawn. (Drawing by Erwin Sieche)Single 19cm L/35 turret.Profile and plan of the Škoda design of a twin 9cm L/45 turret proposed as secondary armament for Monitors XI and XII. The fifth gun of this calibre was to have been mounted in a shield on the rear superstructure, similar to those on the rebuilt Temes.A future monitor project proposed in 1915 by Engineers Silvius Morin and F Cossutta of Stabilimento Tecnico Triestino. (Drawing by Erwin Sieche)Monitor Design ProjectsThis long shallow-draught vessel was intended to mount two Škoda 30.5cm L/12 siege howitzers, of the type used since 1914 to batter fortifications from the Western Front to Poland. The huge howitzers, each weighing more than 20 tons, fired a HE shell weighing 287kg at a rate of ten shells an hour, to a range of 12,300m (13,500 yards). The latest model, to be mounted in the monitor, in hooded barbets, was the M 16 with longer L/12 barrel and 360° traverse. Interestingly, in 1918 a Škoda howitzer, the larger 38cm L/17 model, was test-fired on the old coast defence ship SMS Budapest in place of the forward turret. It proved unsuccessful due to the ship continuing to roll with the recoil of firing, making for poor accuracy with subsequent shots. There is no reason to believe that the river monitor design would have been any more successful had the vessel been constructed. Proposed secondary armament was to be two of the powerful 7cm L/50 guns in DP mountings.Dimensions:Dimensions:Displ:

800 tons; L: 68m/223ft 1in; B: 11m/36ft 1in; D: 1.5m/4ft 11in. Guns/Armour: Guns/Armour: 2 × 30.5cm L/12 howitzers; 2 × 7cm L/50 anti-balloon guns; 4 × 8mm MG/Barbettes 40mm; Hull 60mm to 30mm; Deck 30mm; Conning tower 50mm front, 40mm rear. Fate: Fate: Never begun, project only. (Drawing by Erwin Sieche)

On 11 December 1917, Engineer Silvius Morin proposed a super river monitor model displacing 2,000 tons. Suitable single-gun 24cm L/40 turrets were available on the pre-dreadnought coast-defence ship SMS Budapest, and the old armoured cruiser SMS Kaiser Karl VI. Once again, the state of the Empire at this late stage of the war precluded laying down any such large river monitor.

Dimensions: Displ: 2,000 tons; L: 80m/262ft 5in; B: 15m/49ft 3in; D: 2m/6ft 7in. Guns/Armour: Guns/Armour: 2 × 24cm L/40; 4 × twin 9cm L/45 anti-balloon guns. Fate: Fate: Never begun, project only. Škoda 7cm L/50 gun on the LA mounting, planned for the secondary armament. The most powerful of the 7cm weapons, its shell case was the long 66x575 R. The giant Škoda 30.5cm L/12 siege howitzer planned for the 1915 monitor. (Tacom 35th scale model publicity shot)

**RIVER PATROL BOATS**

**RIVER PATROL BOAT**

Patrouillenboot a Armed with an 8mm Salvator-Dormus MG and two spar torpedoes, and fitted with a funnel cowl. She could conceivably have carried a pair of launch cradles for 14in Whitehead torpedoes, but they would have greatly increased her draught and reduced the stability of this small craft. Launched: 1894 by Schichau, Elbing. Dimensions: Displ: 33 tons; L: 22m/72ft 2in; B: 3.5m/11ft 6in; D: 1.1m/3ft 7in. Power/Speed: Power/Speed: Single screw; 2-cyl compound steam engine. Guns/Armour: Guns/Armour: 1 × 8mm Salvator-Dormus Model 1893 MG; 2 × spar torpedoes/Bulletproof conning tower.

Patrouillenboot a. (Drawing by László Benczúr)

Patrouillenboot b As Patrouillenboot a had not met expectations, a larger PB was ordered from Danubius, powered by internal combustion engines rather than steam. In company with the monitors Temes and Körös and the minesweeper Andor, Patrouillenboot b broke through the Serbian mine barrage and entered the Sava River under heavy shellfire, on 28 September 1914. Patrouillenboot b was paid off in 1915. Launched: 1906 by Danubius Schönichen-Hartmann, Budapest. Dimensions: Displ: 36.5 tons; L: 28m/91ft 10in; B: 4.4m/14ft 5in; D: 0.4m/1ft 4in. Power/Speed: Power/Speed: Twin screws; 4-cyl internal combustion engines. Guns/Armour: Guns/Armour: 1 × 37mm Hotchkiss Model 1885 QF; 2 × 8mm Salvator-Dormus Model 1893 MG/Bulletproof conning tower, MG turrets and crow's nest. Fate: Fate: Stricken 23 August 1915.

Patrouillenboot b. (Drawing by László Benczúr)

With the local beauties perhaps expecting a cruise on the river. Patrouillenboot c and d

Patrouillenboot c was scuttled at Pancsova on 9 September 1914. Patrouillenboot d was sunk by Serb artillery at Belgrade on 15 May 1915, showing the vulnerability of these small craft to artillery fire. Launched: 1909 by private yard, Lustenau, Bodensee. Dimensions: Displ: 39 tons; L: 30m/98ft 5in; B: 4.4m/14ft 5in; D: 0.7m/1ft 4in. Power/Speed: Power/Speed: Twin screws; 4-cyl internal combustion engine. Guns/Armour: Guns/Armour: 1 × 8mm Salvator-Dormus Model 1893 MG/Bulletproof conning tower, MG turret and crow's nest. Fate: Fate: c scuttled 9 September 1914; d sunk 15 May 1915.

Patrouillenboot c and d. (Drawing by László Benczúr)

Patrouillenboot c. Patrouillenboot e

and fPatrouillenboot f was renamed Stör (I) in December 1916. She was transferred to the Adriatic Lagoon Flotilla 'Acquaeduct' in mid-March 1917, and served there as PM 1 (Panzer Motorboot = Armoured Motor Boat). There is no note of her ultimate fate but it is probable she was taken over by the Italians in 1920. Launched: Launched: 1908–9 by Yarrow, Glasgow. Dimensions: Displ: 12 tons; L: 18m/59ft; B: 2.7m/8ft 10in; D: 0.4m/1ft 4in. Power/Speed: Triple screws; 5 × petrol engines. Guns/Armour: Guns/Armour: Both: 1 × 8mm MG; Stör: + 1 × 37mm Hotchkiss Model 1885 QF/Bulletproof shield protecting the wheel and crew's nest; Stör: MG turret. Fate: Fate: e sold 1913; f as Stör (I) to Italians 1920? Stör (I). Right: Patrouillenboot g and h. (Drawings by László Benczúr) Patrouillenboot e, showing the distinctive lines of the Yarrow motor boat, and the stern flap to prevent the boat from sitting down at speed. Ordered in 1908/1909 from the yard in Glasgow, the high operating costs led to her being sold to a private buyer in 1913. Patrouillenboot g and h Yarrow-type Patrouillenboot g was built by Danubius in 1909. She was scuttled at Pancsova on 10 September 1914. Her sister Patrouillenboot h was renamed Lachs in December 1916 and transferred with Patrouillenboot f to the Adriatic Lagoon Flotilla 'Acquaeduct' in mid-March 1917, where she served as PM 2. Once again, her ultimate fate is not known, but as with PM 1 she probably became Italian in 1920. Launched: Launched: 1909 by Danubius, Budapest. Dimensions: Displ: 12 tons; L: 18m/59ft; B: 2.7m/8ft 10in; D: 0.4m/1ft 4in. Power/Speed: Triple screws; 5 × petrol engines. Guns/Armour: Guns/Armour: 1 × 37mm Hotchkiss Model 1885 QF; 2 × 8mm MG/Bulletproof shield protecting the wheel; armoured conning tower, MG turret and crew's nest. Fate: Fate: g scuttled 10 September 1914; h as Lachs to Italians 1920? Patrouillenboot h. 60-ton Patrouillenboot The Navy budget of 1914/15 allocated funds for two 60-ton and four 120-ton patrol boats. The smaller 60-ton boats i and k were built within a year at the DDSG shipyard at Budapest which had had no work on private orders since the outbreak of the war. Before the vessels were launched it was decided to name the patrol vessels after fish found in the Danube. 60-ton Patrouillenboot. (Drawing by Erwin Sieche) Fogas ('Pike-perch'). Note the scale provided by the crewmen, otherwise these 'miniature destroyers' are hard to size from a plan alone. Here she shows off her two Danube-type anchors. Csuka ('pike'). The armoured shelter in front of the mainmast protects the auxiliary steering position. The forward mast and crew's nest can telescope downwards and the rear mast pivots between brackets, to pass under bridges. Patrouillenboot i was commissioned in December 1915, and in 1916 took the name Fogas (Hungarian for 'pike-perch'). In April 1920 she was transferred to the Austrian Army's Pioneer Corps, under her original name. For her subsequent service, see AUSTRIA Post-1918. Patrouillenboot k was commissioned in March 1916 as Csuka (Hungarian for 'pike'). In 1920 she was ceded to Hungary, under the name Siófok. For her subsequent service, see HUNGARY. Launched: Launched: Late 1915 (Fogas), early 1916 (Csuka), by DDSG Shipyard, Budapest. Dimensions: Displ: 60 tons; L: 36m/118ft 1in; B: 4.6m/15ft 1in; D: 0.9m/2ft 11in. Crew: Crew: 27. Power/Speed: Power/Speed: Twin screws; 2 × 400ihp VTE steam engines/12 knots. Guns/Armour: Guns/Armour: 1 × 66mm L/30

K.09; 2 × 8mm MG/Hull 5mm; Deck 4mm; Turret 5mm; Conning tower 5mm.Fate:Fate:Fogas transferred to Austria 15 April 1920; Csuka ceded to Hungary 1920.120-ton ClassThe larger 120-ton boats, l, m, n, and o, were built within one year by Ganz & Co. Danubius Maschinen-Waggon- und Schiffbau A.G., Budapest and commissioned on 14 March, 28 March and 28 April 1916 respectively. They were allocated the following fish names: l became Wels ('Cat-fish'), m became Barsch ('Perch'), n became Compó ('Tench') and o Viza ('Sterlet').In December 1918, Wels and Barsch were interned at Beograd, and in January 1919 the Yugoslavs briefly commissioned them as Bregalnica and Neretva respectively. However, with the redistribution of the ex-Austro-Hungarian vessels, on 15 April 1920 Wels and Viza were allocated to Hungary as Szeged and Kecskemét respectively. In addition, Compó, which had been allocated to Austria, was never re-commissioned, and was later sold to Hungary and renamed Györ. For their subsequent service, see HUNGARY.At the same time in 1920 Barsch was allocated to Austria and re-commissioned under her original name. For her subsequent service, see AUSTRIA Post-1918.Launched:Launched:Late 1915 and early 1916, by Ganz & Danubius, Budapest.Dimensions:Dimensions:Displ: 129 tons (133 tons full load); L: 44m/144ft 4in; B: 6m/19ft 8in; D: 1m/3ft 3in.Crew:Crew:27.Power/Speed:Power/Speed:Twin screws; 2 × 600shp AEG geared steam turbines/15 knots (up to 18.5 knots on trials).Guns/Armour:Guns/Armour:2 × twin 66mm L/26; 4 × 8mm MG/Hull 8mm; Deck 6mm; Turret 5mm; Conning tower 5mm.Fate:Fate:Transferred as above details.Three more 120-ton boats were ordered from Ganz & Co. Danubius but were not completed until 1918. They were larger, with a dual-purpose armament. Boats p and q were named Stör (II) ('sturgeon') and Lachs (II) ('salmon'). Patrouillenboot r was launched in 1918 but never commissioned and was broken up in Hungary.In January 1919 Stör and Lachs were commissioned by Hungary as Komárom and Pozsony respectively, but in 1920 Stör was officially allocated to Austria and re-commissioned under her original name. For Pozsony, see HUNGARY; for Stör, see AUSTRIA Post-1918.120-ton class. (Drawing by László Benczúr)Launched:Launched:1918 by Ganz & Danubius, Budapest.Dimensions:Dimensions:Displ: 129 tons (140 tons full load); L: 45.5m/149ft 3in; B: 6m/19ft 8in; D: 1m/3ft 3in.Crew:Crew:42.Power/Speed:Power/Speed:Twin screws; 2 × 700shp AEG geared steam turbines/16 knots.Guns/Armour:Guns/Armour:Stör and Lachs: 2 × 75mm L/30 K 16 DP guns; 6 × 8mm MG. Patrouillenboot r: 2 × 9cm L/45 DP guns; 6 × 8mm MG/Hull 10mm; Deck 6mm; Turret 5mm; conning tower 10mm.Fate:Fate:Stör to Austria; Lachs to Hungary; r broken up after the war.Compó (Hungarian for 'Tench'). Once more, in the absence of crewmen in a photo to give an idea of scale, one could easily mistake these river patrol gunboats for small destroyers.The twin 66mm L/26 gun mounting which armed the four patrol boats of the Wels class. Although still compact, they were somewhat more spacious than the sternmost cupola on Bosna and Sava. (Drawing by László Benczúr)The new dual-purpose single turret designed for 'p' and 'q', armed with a 7.5cm L/30 Škoda gun.Stör (II). (Drawing by László Benczúr)(Plans of Linz courtesy of Erwin Sieche)LinzIn 1914 and 1915, an armoured motor boat, Linz, operated on the Lakes and River Flotilla, armed with a 7cm L/42 and three



MGs. Also, for the FMK armed riverboats, see GERMANY, Danube. ARMED STEAMERS ARMED STEAMERS With such a large expanse of the Danube and its tributaries to patrol, it was only to be expected that the purpose-built monitors and patrol boats should be backed by an extensive flotilla of requisitioned and armed river steamers. The vessels included the Artur, Balaton, Dunajec, Goplana, Kopernic, Krakow, Kraus, Krystina, Kujawiak, Melsztyn, Nadwislanin, Neptun, Planeta, Polonez, Przyjacieli Publicy, Pulawy, Samson, Steinkeller, Tyniec, Una, Wanda, Wawel (A), Wawel (B) and Wenera. Many of these can be found on the Website of . On the right is the ex-DDSG steamer Una (227 tons; length 54m/177ft). She survives at the time of writing as the Zupa, and is awaiting restoration at Belgrade. On the left is Inn with the telescopic lattice mast lowered. Ex-DDSG steamer Samson, fitted out as a river gunboat (467 tons; length 62m/203ft 5in). Note how her deck curves downward at bow and stern similar to the arrangement pioneered on Maros and Leitha, and for the same reasons. From the drawing she is armed with two 7cm L/42 on the upper deck and two 7cm L/18 at bow and stern, no doubt supplemented by several 8mm Schwarzlose MG. (Drawing by László Benczúr) The following are a selection of photos and plans: Samson. Tied up alongside is the Russian Danube submarine S-3, captured at Reni on 3 March 1918. Balaton, another steamer with curved deck line (displacement 225 tons, length 55m/180ft 5in), armed with two 7cm L/42 plus a 8mm Schwarzlose MG on the upper deck and two 7cm L/18, at bow and stern. (Drawing by László Benczúr) Bascka and Bája These two small river tugs, 80 tons displacement and 21.5m (70ft 6in) long, were quite well-armed for their size, and the wheelhouse was armoured. Note the funnel is able to pivot rearwards to pass under bridges, and it also acts as a mast for radio aerials. Bascka was sunk by a mine in July 1919. (Drawing by László Benczúr) Bája, showing her forward 7cm L/18 Škoda QF cannon. Behind the shield on the wheelhouse roof is an 8mm MG, probably a Salvator-Dormus Model 1893. VISTULA FLOTILLA VISTULA FLOTILLA The Austro-Hungarian Navy had planned the formation of a Vistula Flotilla as early as 1889, with the paddle steamers Wawel and Krakow. In 1897 they commissioned the paddle tug Krystina, the passenger steamer Dunajec and the two small paddle steamers Wilga and Iskra. In 1910 the Zieleniewsky Works in Krakau launched the Melsztyn, Wanda, Kopernik and Tyniec. With the Balkan crisis of 1912, in November of that year the river steamers began to be armed: Wawel received four 37mm Hotchkiss and two 8mm MG, Wanda, Melsztyn and Kopernik two 37mm and two 8mm MG, and Dunajec and Tyniec received just a pair of 8mm MG each. In addition, steps were taken to add bulletproof protection: 8mm around the machinery spaces, and 5mm on the deck and conning tower. Other steamers added up to thirty sandbags plus two MG on tripods. The Vistula Flotilla was put on a war footing on 30 July 1914, to protect Austro-Hungarian shipping from Russian attacks, operating from bases in Austrian Galicia. In addition to the Austro-Hungarian vessels, the German Volunteer Motorboat Corps, or FMK, was sent to the Vistula by the German Army. For details, see GERMANY. After the Russian Army had been expelled from Poland, in 1915 the Flotilla extended its zone of operations further to the North, escorting tugs and barges carrying supplies for Austro-Hungarian and German forces operating to the east of the River. In March

1916 the Flotilla was increased by the arrival of seven armed motorboats: Alpha, Gamma, Dora, Ida, Cb der Enns, Hedwig and Gott mit uns. Their numbers were swelled by the inclusion of two captured Serbian vessels Save and Danubius. Wawel Profile of Wawel. (Drawn by Herbert Winkler, in *Marine - Gestern, Heute, 1975 Vol 2*) Krystina Krystina, with white hull and buff upperworks, with her funnel and mast folded down to pass under the bridge on which the photographer is standing. (Photo from Website) The armament fitted on the stern of Krystina: two 37mm Model 1885 single-barrelled Hotchkiss Model 1885 QF guns, with an 8mm Schwarzlose MG mounted between them, giving formidable firepower to such a small vessel. (Photo courtesy of ) Profile of Krystina, powered by a 150ihp steam engine, and drawing 0.65m/2ft 1½in. Armed with four 37mm Hotchkiss QF and two 8mm MG. (Drawn by Herbert Winkler, in *Marine - Gestern, Heute, 1975 Vol 2*) Dunajec Dunajec seen from a bridge. She appears here to be armed with two 37mm Hotchkiss Model 1885 QF. (Photo courtesy of ) Melsztyn, Wanda and Kopernik Launched: Launched: 1910 by Zieleniewsky Works in Krakau. Dimensions: Displ: 510 tons; L: 38m/124ft 8in; B: 4.7m/15ft 5in; 8.8m/28ft 10½in over paddleboxes; D: 0.54m/1ft 9in. Power/Speed: Power/Speed: Side paddle wheels; Steam engines 108ihp. Guns/Armour: Guns/Armour: 2 × 37mm Hotchkiss Model 1885 QF; 2 × 8mm MG/Machinery spaces 8mm; Deck and Conning tower 5mm. The double-enders built for the K.u.K. in 1910. Note their sloping deck profile and the rudders fore and aft. (Drawn by Herbert Winkler, in *Marine - Gestern, Heute, 1975 Vol 2*) Nadwislanin Profile of Nadwislanin, powered by a 120ihp steam engine, and drawing 0.50m/1ft 7¾in. Armed with two 37mm Hotchkiss QF and two 8mm MG. (Drawn by Herbert Winkler, in *Marine - Gestern, Heute, 1975 Vol 2*) Polonez (100ihp, draught 0.70m/2ft 3½in), Goplana (50ihp, draught 0.75m/2ft 9½in) and Neptun (60ihp, draught 0.55m/1ft 9½in). POSTSCRIPT POSTSCRIPT During the last days of the First World War all surviving floating and operable units of the K.u.K. Donauflotille returned to their base barracks at Óbuda, a suburb of Budapest. There, on 6 November 1918, they were ceremonially paid off. The vessels were disarmed under the supervision of the Allied Control Commissions which operated in both Austria and Hungary. Thus ended a century-old branch of the Austro-Hungarian armed forces. On the eightieth anniversary, 6 November 1998, to celebrate their proud heritage, the Hungarians held a commemorative ceremony in front of the former Barracks of the Donauflotille. During the ceremony two commemorative plaques were unveiled. BELGIUM Belgian explorers and administrators in Central Africa were among the first users of the classic Yarrow type of stern-wheeler. On the lower Congo River the Belgian Force Publique maintained an armed steamer, the Hironnelle, with a 6-pounder (57mm) Nordenfelt gun. With the outbreak of the Great War other river steamers were armed. CONFRONTATIONS ON THE SANGHA RIVER On 3 August 1914, the German community of Kinshasa, together with several hundred Congolese recruits, set out on board the steamer Dongo to reach the German colony of Eastern Kamerun. Their intention was to link up with German Schutztruppen on the River Sangha, and then return to occupy Kinshasa and Brazzaville. However, French troops based in Brazzaville armed the steamer Albert Dolisie and set off in pursuit. Just three days later

the Dongo was captured, and German plans thwarted. The following month the French in Brazzaville asked for Belgian aid in neutralising the remaining German positions on the River Sangha. The Belgians armed a new paddle steamer, the PS Luxembourg, with one 3-pounder Nordenfelt QF gun and two 7.65mm machine guns. She sailed with a force of sixty Congolese troops, returning to Kinshasa with wounded men in early November, then finally led a force of six ships up the Sangha. German resistance was overcome just before Christmas.

#### LAKE TANGANYIKA

On Lake Tanganyika in 1914 the Belgians had a 90-ton 22.5m (73ft 9in) steamer, the *Alexandre Delcommune*, and were building a large vessel, the *Baron Dhanis*, of 700 tons. Both were capable of being armed as gunboats if necessary. On 6 August 1914 the *Delcommune* had been allowed to leave the German port of Kigoma due to confusion on the part of the German authorities as to whether the Belgian Congo would remain neutral. The Germans aboard the newly-armed *Hedwig von Wissmann* spotted the *Delcommune* on 25 August, but the Belgian steamer was able to use her superior speed to escape. However, the Germans followed her to Mtoa and shelled her, forcing the *Delcommune's* crew to beach her. She was again attacked on the night of 8/9 October, this time by a force which landed and placed explosive charges, causing slight damage. Finally on 23 October she was shelled once more by the *Hedwig*, by this time towing a pair of 8.8cm guns, and after receiving some thirty hits was severely damaged. The *Delcommune* would be repaired and armed, with a 12-pounder gun, under the new and appropriate name of *Vengeur*.

#### Alexandre Delcommune in her original pre-war form, with two funnels.

#### Baron Dhanis after the war.

#### Alexandre Delcommune after being rebuilt, with presumably at least a new or repaired boiler, with now just one funnel. She is armed with a 12-pounder gun, so here she is now known as *Vengeur*.

#### Mosselback ('Dix-Tonnes')

Stung into responding, the Belgians sent by rail to the lake a 10-ton armoured motor launch, 14m (45ft 11in) long. Renamed the *Mosselback*, she was manned by one officer and six men. *Mosselback* was armed with 47mm (3-pounder) and 57mm (6-pounder) Nordenfelt guns, but these severely overloaded her, and the Belgians had to remove some armour plating and reinforce her structure, reducing her designed speed. In July 1915 observers on shore noted the approach of the German *Kingani*, and the *Mosselback* sortied to engage her. Outgunned, the *Kingani* retreated, and the Belgian launch was not fast enough to catch her. *Mosselback*, originally known as the 'Dix-Tonnes', armed with a 47mm and a 57mm gun. Note the *Netta* in the background. (Photo Belgian Army Museum)

#### Netta

#### BELGIUM

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**Mosselback ('Dix-Tonnes')** Stung into responding, the Belgians sent by rail to the lake a 10-ton armoured motor launch, 14m (45ft 11in) long. Renamed the **Mosselback**, she was manned by one officer and six men. **Mosselback** was armed with 47mm (3-pounder) and 57mm (6-pounder) Nordenfelt guns, but these severely overloaded her, and the Belgians had to remove some armour plating and reinforce her structure, reducing her designed speed. In July 1915 observers on shore noted the approach of the German **Kingani**, and the **Mosselback** sortied to engage her. Outgunned, the **Kingani** retreated, and the Belgian launch was not fast enough to catch her.

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Gregory A Haggard, "You get alot for your money. Comprehensive is not adequate to describe the contents of this book. Well researched and illustrated it is all you will ever need to know about the specifications of all types of riverine Warcraft through the years. Not much info. on their actual utilization in some cases but still-a lot of information."

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Michael Cavallaro, "Comprehensive. Beautifully illustrated, a thorough, detailed, comprehensive history of river gunboats. A must for naval history libraries. An excellent addition to any collection of Jane's, Conway's, and Combat Fleets."

Jim Stuht, "Terrific Resource!. Think "Conway's" but for River Gunboats. Only scanned a few entries so far, but looks excellent."

Charles A Walters, "Fulfills it's Remit. This book costs a bit and takes up a lot of space, and you probably already have some book on gunboats. You certainly have access to wikipedia, so before we plunk down our money it seems worthwhile to ask a few questions: Is the definition of gunboats broad enough to include all the riverine combatants in the American Civil War? Modern river gunboats? Does it have an index? A filmography? Are the pictures of camouflage schemes in Appendix 2 in color? Does it have a section on postage stamps from around the world that feature gunboats? Is this book an unwieldy size? Will this book lie flat while I study it? Are there pictures on every page? The answers are yes, yes, yes, yes, yes, yes, yes, and almost every page. But it's not all "yesses". There are some "noes", too. Are there any maps? Are all the pictures in color? Are there lots of descriptions of combat? Maybe it would be more helpful to just describe it. This is a 11" wide, 12" tall book of 336 pages. It's organized by nation, from the tiny and ephemeral Acre to Russia and the CSA. There's an introduction for each nation, since each country's operation of gunboats is different and requires different organization, then all the gunboats are described, organized by region of operation (when necessary) and chronology. There are pictures or plans for most vessels, along with the data block with the vital statistics. Some combat descriptions are interspersed, but they are far from comprehensive. Similarly, specifics on the design and power train are frequently but not always present. There are a lot of pictures, more pictures than I would have guessed you could find. Definitely some I feel I should have seen but definitely have not. There are photos, original plans, period drawings and other art, and modern drawings. There are not only images of the vessels, but of the equipment and

weapons. Many of the photos have interesting things in the background, too. There are also some photos of sunk, abandoned, and wrecked boats, kinda neat. The bibliography is extensive, but not annotated. It includes a bunch of websites. The index seems complete, including not just vessel names and individual people but also topics that are addressed in the various entries such as technologies, battles, and manufacturers. Do you need this book? You can get plenty of info from wikipedia for the important vessels, and if you're interested in gunboats you probably have a few books, so what are the selling points here? Comprehensiveness is one, everything is here, even if only lightly touched on. Second, it is a beautiful book; if gunboats are in your wheelhouse you will be pleased to own this book. Thirdly, there are plenty of books about gunboats in Africa and China, but there has been a lot of shooting on the river systems of South America, Eastern Europe, and Russia. I haven't seen many books on these, but they are covered here in full. The Russia section is early 10% of the book. Finally, this book includes everything there is to know about the Swiss navy. Seriously. Two pages, the same as Serbia or Burma/Myanmar. The one glaring fault, from the war gamer's point of view at least, there is very little info on armor. Almost none. There is a "Guns/Armor" section in every data block, but while the guns are always described armor is rarely mentioned. Occasionally you see "armored bridge" or "bullet proof plating", and you could infer from the description how the ship was constructed, but none of us are going to be satisfied with the armor info. Another, smaller disappointment is the modeling section. That's not necessarily expected, but in the introduction the author says he was "obliged to delete" an appendix on researching and building model gunboats. Not to worry, that info will be on his website. Except that it's not. In fact, as of November 2018 this book is mentioned on his website only as a work in progress. But it just came out, I trust that in time the work he did on modeling will be available to us, and I look forward to it! Beyond all this the book has been prepared carefully. The "Notes on Plans and Specifications" section, explaining in the Introduction how the author handled certain problems with the sources, and other clues tell me that the author was careful, and took the time where it was worthwhile to tell us how he was careful. I am happy to have this and expect it to be enjoyable, useful, and inspires some modeling and gaming."

maddogporter, "Send a gunboat.....this is what it's about!. I've waited over 2 years for this very delayed publication to appear & it was well worth the wait!! A true tour de force on the subject, very well written & illustrated (masses of rare photos) & lots of side view technical drawings (though quite small), like the very similar format book on armoured trains this publication is unlikely to be surpassed in its field..very highly recommended for anyone with even a passing interest in the subject"

Jörn Thorsten Kahtz, "Flussskanonenboote. Hier in diesem Buch geht es um die kaum beachtete Klasse der Flussskanonenboote, die aber Militärgeschichtlich eine große Rolle gespielt haben, sei es auf dem Mississippi oder dem Nil oder Yangtze um nur einige Flüsse zu nennen. Zu den

Flüssen erfährt man Nichts, aber das ist nicht schlimm. Wie der Autor schreibt wird man da im Internet hinreichend fündig, was ich bestätigen kann, aber und auch da kann ich dem Autor zustimmen im Internet erfährt man kein vollständiges Bild über die Flusskanonenboote. Hier hat der Autor sich viel Mühe gemacht mit der Recherche um das Thema erschöpfend darzustellen. Ich denke es ist ihm gut gelungen. Die Skizzen und Photographien reichen von grottig bis gut und sind abhängig von der jeweiligen Quelle und die Quellenlage ist eben oft nicht gut, der Autor hat das Bestmögliche daraus gemacht.MFG an die LeserschaftJTK”

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GRAEME, “RIVER GUNBOATS CAME TO THE FORE IN THE 20TH CENTURY IN RIVERENE WAR IN VIETNAM. 21 CENTURY TURNING AWAY FROM RIVERENE WAR GUNBOATS TO SWIFT FAST MOVING LIGHTLY ARMED CRAFT FAR FROM THOSE USED IN VIETNAM.SHIP TO SHIP CURRENT MISSILES DICTATING WHAT TYPE OF CRAFT CAN BE USED IN CONFINED RIVERENE WARS OF THE FUTURE PLUS TYPES OF PROPULSION UNITS SUCH AS BEING PROPELLOR DRIVEN OR WATERJET PROPULSION.”

Thomas, “Fantastic Book. This book is exactly as i wanted it to be. Has wonderful pictures as well as accurate descriptions. Love it.”

The book by David Stark has a rating of 5 out of 4.7. 48 people have provided feedback.

Title Copyright CONTENTS Introduction Notes on the Plans and Specifications Acknowledgements Acre Angola Argentina Austria post-1918 Austria-Hungary Belgium Bolivia Brazil Bulgaria Burma/Myanmar Cambodia Cameroon China Colombia Confederate States of America Congo, Democratic Republic Croatia, Independent State 1941–1945 Czechoslovakia Egypt Equatorial Guinea Estonia Finland France Germany Great Britain Guinea Hungary Iraq Italy Japan Malawi Manchukuo Mozambique Nigeria Paraguay Peru Poland Portugal Romania Russia Serbia South Africa South Vietnam 1955–1975 Spain Sudan (Mahdist State) Sweden Switzerland Thailand Turkey Uganda Ukraine United States of America Uruguay Uzbekistan Vietnam Yugoslavia Bibliography Appendix 1: River and Lake Gunboats in Popular Culture Appendix 2: River Gunboat Camouflage Schemes



## **Book Information**

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Word Wise: Enabled

Sticky notes: On Kindle Scribe

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