

THYSVILLE STATION, ON THE SUMMIT-LEVEL OF THE CONGO RAILWAY.
It was named after General Albert Thys, the guiding spirit of the enterprise.

THE KEY TO THE CONGO

HOW THE CATARACTS WERE AVOIDED, AND TRANSPORT DIFFICULTIES
WITH THE INTERIOR OF THIS RICH TERRITORY SOLVED, BY CARRYING THE
RAILWAY OVER THE MOUNTAINS



WHEN the explorer Stanley, coming from the depths of the African continent, revealed the inexhaustible resources of the vast country drained by the Congo River and its maze of confluent, he uttered grave warning. Without the railway the territory and its wealth would not be worth a penny.

The mighty river drains a huge elevated basin hemmed in by ragged, sprawling mountains, and makes thunderous frenzied escape to the Atlantic by a string of cataracts drawn out for more than 200 miles, and in such a manner as to defy taming by the engineer in the interests of navigation.

Above the foaming portal winding waterways penetrate the innermost recesses of the continent. This network of water-lines, aggregating nearly 10,000 miles, serves an

area of more than 965,000 square miles. On the Congo itself there is a continuous run of 960 miles without let or hindrance, this marine boulevard at places ranging from 10 to 14 miles in width. The affluents are equally penetrable: one, with its chain of higher tributaries, can be threaded by shallow draft steamers for 1,800 miles; while another offers a clear way for over 800 miles.

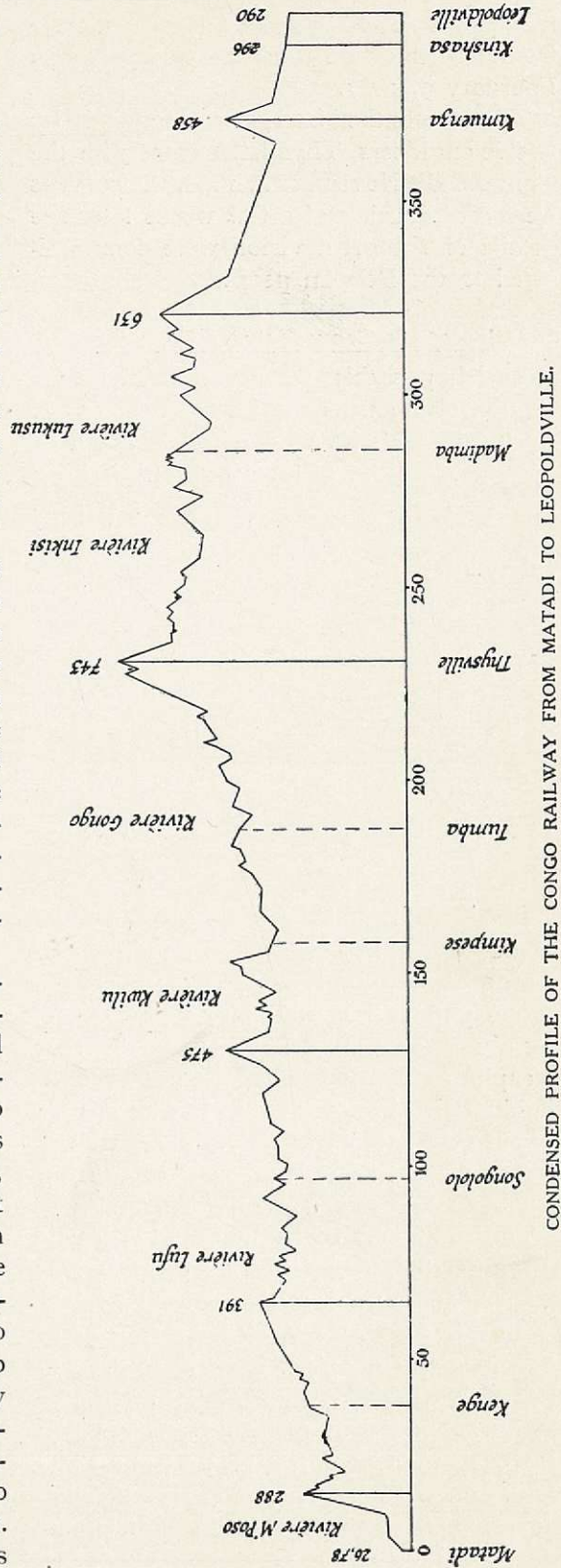
The commercially adventurous were lured to daring experiment. A small steamer of 5 tons was built and shipped in sections to the mouth of the Congo, to be hauled, tugged, and carried through nearly 300 miles of dense jungle to the pool at the head of the cataracts, where, on a primitive slip, the sections were reassembled. Launched during December, 1881, this diminutive craft pushed its way up-stream on a journey of discovery to bring back wondrous stories

of what could be accomplished if only the falls near the estuary could be turned.

So long as they remained unconquered, trade had no future. The heads and backs of negroes were the only means of moving every ounce of merchandise both in and out. The highway was a narrow, winding, switchback trail through dank primeval forest—a portage of sinister memory, lined with the graves of those, both black and white, who were stricken down by the way-side. The journey took 20 days, and as it cost about £50 to transport every ton, it is scarcely surprising that little traffic was maintained. Indeed, ivory was practically the only product which could profitably withstand the heavy charge.

The use of human heads and shoulders for the movement of freight, and the price paid for trade in lives, inevitable in the circumstances, brought about a world-wide revulsion of feeling. Accordingly, when the Congo territories were discussed at the Berlin Conference, in 1884, it was decided to suppress human portage, and a clause for the construction of a railway was introduced into the pact. Fourteen nations appended their signatures to this undertaking, but it took twenty-two years to translate words into action.

British enterprise made the first endeavour to interpret the famous railway-building clause. A syndicate was formed in London during the early 'eighties to approach King Leopold for the concession to turn the formidable cataracts. He was favourably disposed towards the proposal, but the Belgian people did not endorse it sympathetically. At this juncture an energetic and imaginative officer of the Belgian Army, Lieutenant-Colonel, afterwards General, Albert Thys, submitted to Leopold a definite scheme for opening up the country. The sovereign was sufficiently shrewd to recognize the advantages of keeping the development of the Congo in Belgian hands, and so turned a deaf ear to the importunities of the British syndicate. With the assistance of prominent business



men Colonel Thys founded the Congo Commercial and Industrial Company on February 9, 1887.

Three months later, accompanied by twelve engineers, Thys left Brussels for the Congo. By November 4, 1888, the surveys were completed, and a few weeks later the details of the great vision were communicated to the Belgian people.

Flotation of the Congo Railway Company

The impassable section of the Lower Congo lies about 100 miles from the coast. At the foot of the long winding reach of tumultuous waters, foaming and boiling through a gorge where the walls rear skywards for hundreds of feet, was the native village of Vivi, which, in the first instance, was thought possible of conversion into the lower terminus. This idea had to be abandoned because of Vivi's insalubrious situation and difficulty of access. Fortunately, on the opposite bank was a more attractive and healthy site, approachable by ocean-going steamers drawing 18 feet of water. So it was decided to establish a new terminal port, Matadi, at this point.

The projected railway was to be carried from Matadi round the cataracts in a huge loop 260 miles in length, with its upper end resting on Dolo, in Stanley Pool, where the waters gather preparatory to their boisterous plunge seawards. It was estimated that a capital of £1,000,000 would suffice to build the road and to equip it with motive power, rolling-stock and stations, as well as to defray the various charges arising during the four years of construction.

The promoters of the undertaking were sanguine that, from the day the line was opened, sufficient revenue would be forthcoming to meet all outgoings, estimated at £100,000 a year—5 per cent. interest upon the capital, and £50,000 per annum for operating and maintenance expenses. On this basis the Chemin de fer du Congo was inaugurated on July 31, 1889; the Belgian Government manifested its interest by acquiring shares to the value of £400,000.

In the course of five months Matadi became the centre of great activity. During the early days of March, 1890, the silence of the jungle was broken by the ring of the pick against the rock; the forging of the key to unlock the Congo had commenced.

Matadi, about 100 miles from the mouth of the Congo, lies at an elevation of 87·8 feet above the Atlantic, and the abrupt shaggy edge of the formidable mountain rim frowns menacingly upon it. Consequently, the engineers were faced with an immediate arduous upward toil to 994·8 feet in the course of the first 9·375 miles; of this, 721·8 feet had to be subdued in an advance of 3·75 miles, and the task nearly wrecked the whole undertaking.

Native Labour and Construction

The rock was found to be intensely hard; the pick made slight impression, but the native labour could wield no other tools. Negroes were indispensable; they alone could endure the exhausting climate, and were most resistant to that peculiar form of disease encountered in the steaming jungle. The West African coast was mournfully described as "The White Man's Grave," and the Congo railway-builders learned its tragic truth, because it wrought havoc among the Belgian engineers. The toiling army, 800 strong, was recruited from Sierra Leone, Krooboy and Haussa natives, Zanzibaris and Senegalese, with a sprinkling of Europeans lured to the spot by the spirit of adventure. The builders had been warned against the negroes; they were declared to be lazy, vicious and utterly demoralized by the atrocious liquor bartered at the trading posts. In actual fact, however, the natives proved far otherwise. Naturally they interpreted the term "work" according to their own lights, and were found to be incapable; but this ineptitude was solely due to ignorance of the tools of civilization, and the economic constructive application of brawn and muscle. So long as they were supervised they toiled industriously, but

when the white "boss" turned his back they lapsed into idleness from sheer helplessness.

It was unfortunate that the engineers were called upon at the onset to scale the outer rampart, Palabala, of the ragged rocky rim to the basin of the Congo. The raw unskilled labour could not battle against the rock. It took more than two years to complete the first lap of $5\frac{1}{2}$ miles, and absorbed more than half the capital. With such a slow record of progress and expense no one could hazard a guess as to when the task would be finished or what its cost would be. Little wonder, therefore, that those who had supported the project so enthusiastically were plunged into the depths of despair.

Only one man resolutely declined to be depressed. This was Colonel Thys. He declared the negroes to be becoming more efficient with every passing day, and that once the Palabala was overcome, and the miasmatic lowlands were cleared, more rapid progress would be attained. King Leopold shared this feeling, but such optimism was, generally speaking, at a discount, and the project, from exhaustion of the financial resources, appeared to be doomed. Undoubtedly it would have gone down in disaster but for the prompt realization that failure would be a grave reflection upon Belgian prowess and powers of colonization. The appeal to national pride saved the situation.

The Obstacle of the Palabala

The Palabala almost dismayed the railway builders. Time after time the treacherous quartzite came down, wiping out great lengths of the line, but each time the grade was restored. For eighteen months the engineers struggled on its slope, scooping out from its solid flank a narrow, winding gallery, with a lofty jagged wall sheering up on the one, and a dizzy precipice falling away on the other side. At intervals the ground appeared to fall from beneath their feet in ugly fissures, which

could only be crossed with imposing bridges of steel or massive viaducts of masonry.

When at last, during the opening months of 1893, the engineers stood on the summit of the flanking ridge of the mountain-wall to look back along the $7\frac{3}{4}$ miles of line which they had built, they breathed freely. They had now gained the uplands.

To show how improved conditions and accumulated experience expedited progress, it may be mentioned that the succeeding 15 miles to Kenge were built in about 10 months. The labour problem had become easier. The army, originally 800 strong, now numbered more than 2,000, despite the heavy toll claimed by the swamps.

The Construction Camps

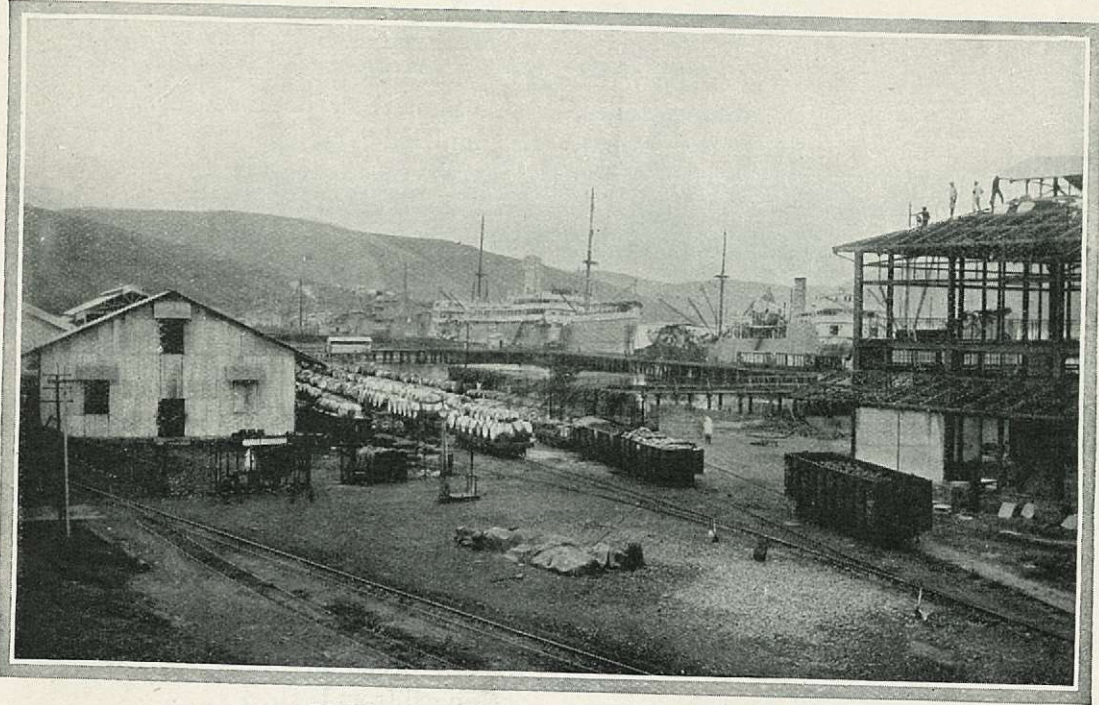
The temporary settlements in the bush were laid out along special lines. The Europeans were accommodated in small frame houses having canvas walls, while the natives were housed in portable, sectionalized wooden buildings, resembling barracks, though, for the most part, they preferred their traditional type of dwelling fashioned from branches and leaves. These were set out in two extensive clearings, contiguous to the railway, and presented picturesque villages amid the luxuriant vegetation. When the time arrived for the camp to be advanced, a party went ahead to clear the succeeding site at a favourable point.

Sunday was camp-moving day. The construction train, with its flat cars, lumbered alongside the dismantled village. The houses of the white men were lifted bodily and loaded on the deck vehicles, while the native barrack buildings were released in sections to be stowed on other wagons. The train moved on to the new site, where the homes of the Europeans were lifted off the cars and set on the ground in an artistic group. A short distance away the sections of the barracks for the natives were re-assembled, the while those who felt so disposed contrived their own homes from the

material offered by the jungle. The train then fussed back to bring up the stores and other impedimenta, and, as a rule, the new village had shaken down to its round of life before the sun had slipped below the western horizon.

succeeding ridge-summit near mile-post 70. Another sharp descent brings the line to the River Kwilu, a few miles beyond which lies Kimpese, 96 miles from the terminus.

Kimpese, entered in 1896, lies at the foot of what might be described as the core of



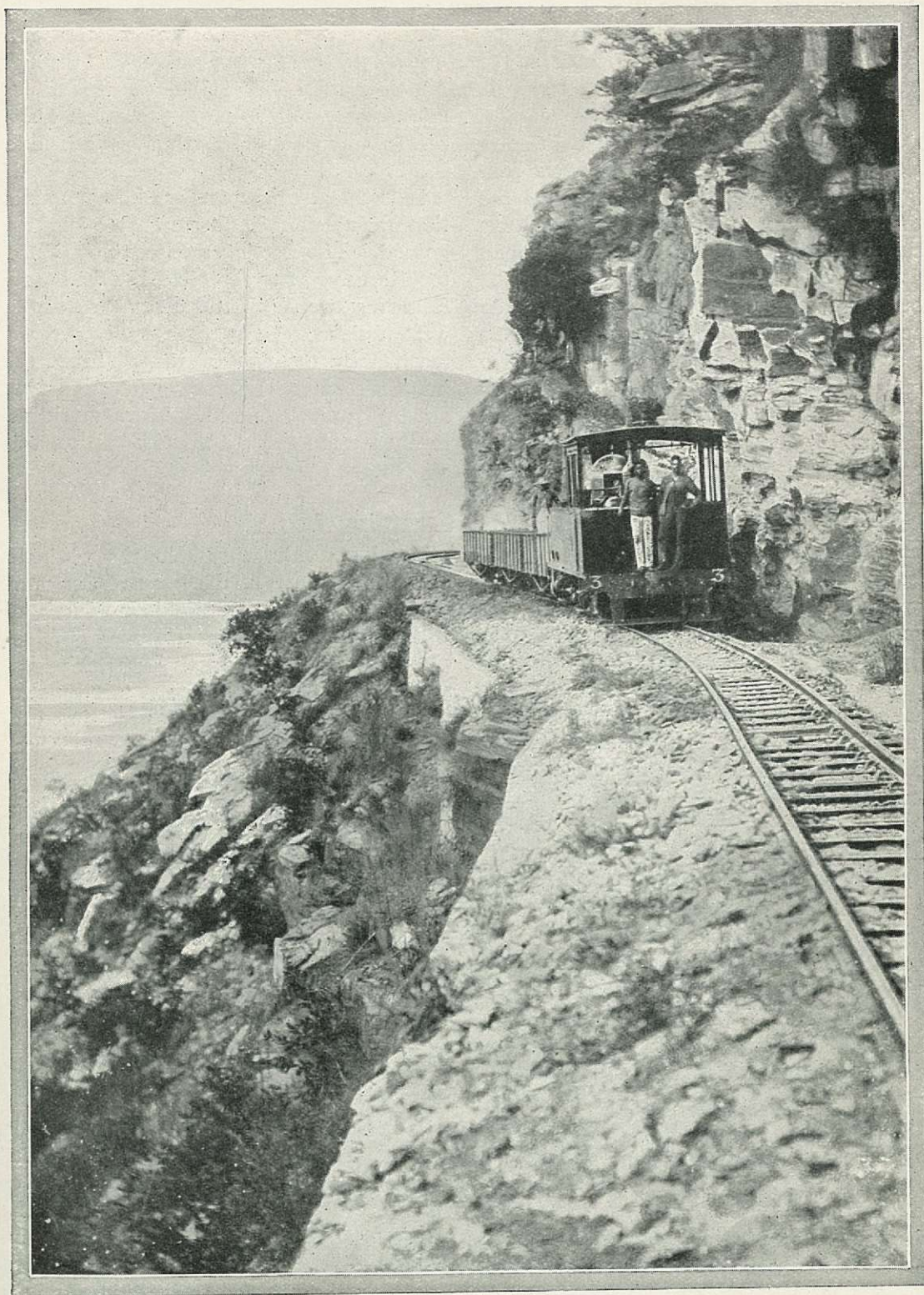
PORT OF MATADI ON THE LOWER CONGO.

The seaward terminal of the Congo Railway is well equipped with quay spaces, sidings, and warehouses to handle its growing traffic.

Pressing on from Kenge, the engineers swung, 1,282 feet above sea-level, across the second obstructing ridge at the 41st mile-post, and then down into the valley to cross the Lufu River. The country throughout the breadth of the mountain rim is undulating, resembling a succession of gradually rising benches on either side to the summit. Each of these benches really constitutes a watershed, through which a tributary of the Congo winds its tortuous way.

The ascents and descents are somewhat striking. Thus, to cross the Lufu River the line has to fall some 330 feet, whence immediately ensues a resumption of the general climb through Songololo, 60 miles out of Matadi, to overcome at 1,550 feet the

the rim bounding the Congo basin on the seaward side. Two miles beyond the station the railway touches the altitude of 1,082.6 feet. At this point starts the long, arduous, upward pull through 43.75 miles to the top of the summit ridge, or mountain of Zona Congo, the only noticeable descent on this section being that into the valley to cross the River Congo near Tumba, 16 miles out of Kimpese. The most arduous stretch upon this section was the final eight miles to the summit, to overcome 731.6 feet vertically, which in the physical sense recalled the scaling of the Palabala. The rock was found to be equally dense and hard, but the advance through this difficult section was rapid. The natives had become more adept in the wielding of the tools;



HOW THE CONGO RAILWAY PENETRATES THE MOUNTAINS.

The track is carried on a narrow shelf, hewn out of the solid rock of the cliff face, at a height of several hundred feet above the waterway.

their ranks were appreciably swelled by recruits from Equatorial Africa, and the engineers had the experience of Palabala to guide them.

One might almost say that a twin summit has to be overcome, seeing that the railway has to subdue two pinnacles in the course of two miles. At mile-post 142.5 the first pinnacle is traversed at 2,386.4 feet, giving way to a fall of about 123 feet in the course of a thousand yards or so. Then the second spur has to be breasted, and this is accomplished at an elevation of 2,437.6 feet, the highest point on the line. In driving up the flank of the Zona Congo the exultant engineers, with great effort, succeeded in finishing the road over the bad stretch between the 126th and 131st mile-posts before the wet season set in, and thus enabled the construction train to push ahead. Then the rain came down with tropical fury, and set up such a rock movement that these five miles of the line were wiped out. The rails were torn up and bent and twisted in the most fantastic manner, were thrown aside, while the grade itself was buried under thousand of tons of broken rock and earth. Those five miles had to be rebuilt and the line consolidated.

The Descent to the River Level

Leaving Thysville, the important station at the summit-level, named after the genius who conceived and was responsible for the completion of this daring railway, the line drops sharply for 3 miles to give way to an easier descent into the valley of the Inkisi River. Further switchbacking through Madimba, 178 miles from Matadi, leads towards the succeeding descent to the Lukusu River, whence there is a give-and-take road to mile-post 200 at 2,070 feet above sea-level. Crossing this ridge the line swings down the interior face of the basin, 604 feet being negotiated in the course of $6\frac{1}{4}$ miles. Then follows a steady descending grade through 22 miles to altitude 1,082 feet. A sharp upward spurt allows the line to clear the last ridge at Kimuenza, 1,502.6 feet

above the sea, whence, after an abrupt initial fall, there is gradual descent through Kinshasa to Leopoldville, the inland terminus on Stanley Pool, 951.4 feet above the Atlantic, and approximately 250 miles from Matadi.

It is interesting to reflect how construction was accelerated once the table-land was gained. The first 26 miles out of Matadi took three years to complete, but during the following twelve months a further 24 miles were finished. The 85th mile-post was reached by the end of 1895. From this point the annual rate of construction averaged 36 miles, and high-water mark was reached upon the concluding section with an average of 6 miles per month.

Completion of the Line

The last rail linking Dolo, the originally selected terminus at the head of the cataracts, with Matadi, was laid on March 16, 1898. With appropriate ceremony and loud cheering, the locomotive, which had steamed out of the lower terminus so proudly eight years before, proclaimed the successful turning of the cataracts with an ear-splitting, long-drawn-out shriek of triumph from its whistle. The driver had piled on as full a head of steam as he dared for this prolonged pæan of joy, to the no little consternation of the natives, who had no idea that the locomotive was endowed with such "lung" power. Three months later there came the official ceremonial opening of the line.

Throughout the 250 miles there are a hundred or so bridges, ranging in span from 33 to 330 feet, as well as numerous viaducts. The track is narrow gauge—750 millimetres, or $29\frac{1}{2}$ inches, colloquially known as the 2-feet 6-inches gauge—with grades running up to 1 in 22 and curves of 164 feet radius. Despite the severity of the ruling grade, the railway is operated by adhesion throughout. All things considered, the steel key to the Congo might appropriately be classed as a mountain railway, and the exceptionally broken char-

acter of the country, far exceeding expectations, caused the estimates to be overwhelmingly exceeded. Instead of £1,000,000 sufficing for its construction and equipment, £2,400,000 had to be spent.

The railway has exercised a far-reaching influence upon maritime traffic both above and below the cataracts. At Matadi iron and steel piers, aggregating more than 1,640 feet in length, have been built for the accommodation of shipping, with facilities for the simultaneous loading or unloading of four ships, drawing 30 feet of water, at all times of the year. Warehouses and quay space of 140,000 square feet have been provided, with $7\frac{1}{2}$ miles of sidings for handling cargoes in and out.

Locomotives and Rolling-Stock

For the operation of the line there are 104 locomotives of 14, 19, 27, 29, 31 and 55 tons respectively, the weight and power of the engines having been steadily increased to cope with the rising tide of traffic. The rolling-stock comprises 870 vehicles of 10, 12, 15 and 20 tons capacity for the handling of freight, and 35 first-, second- and third-class coaches for passengers. Works equipped with most modern plant have been established at Matadi, Thysville and Kinshasa for the erection and repair of locomotives and rolling-stock. Maintenance of the line and its services offer steady employment to more than 5,200 negroes under the supervision of approximately 170 Europeans.

The climate still remains the railway's deadliest enemy, and every effort is put forth to minimize its ravages, although the general health conditions are far more attractive to-day than when the pathfinders first penetrated the country. The company maintains an efficient gratuitous medical service for Europeans, with a hospital at Kinkanda, near Matadi, and a sanatorium at Thysville, which, from its elevated situation and salubrious climate, has become the

most important residential centre along the line.

For the accommodation and treatment of the black employees three hospitals are maintained—at Matadi, Thysville and Kinshasa respectively. The three most important centres are the terminals of Matadi and Kinshasa (the latter for Leopoldville and Dolo) and Thysville, which are provided with a complete system of electric lighting, water-supply and distribution, drainage and sewerage, and factories for the manufacture of ice.

Prospects of the Line

As constructed, the Congo Railway is able to move approximately 300,000 tons of traffic in each direction during the year. At present the actual volume is only about one-fourth of the designed capacity, but the rapid railway development of the Upper Congo, especially in the Katanga country, one of the richest mineral territories in the world, and the expansion of the inland maritime traffic, indicate that this maximum will be reached in the near future. Steamers of 500 tons are now regularly plying the busiest water lanes as far as Stanley Falls, 960 miles from Leopoldville, and beyond.

With the opening of the Katanga country a huge volume of combined rail and water traffic will converge upon Leopoldville for movement over the solitary railway link with the seaboard. So the Chemin de fer du Congo has elaborated a comprehensive improvement scheme, of which the Government has approved. This involves practically the reconstruction of the line throughout its total length. The gauge is to be widened to 1.067 metres—3 feet 6 inches, or standard colonial gauge, conforming with that of Rhodesia, South Africa, and other systems—thus permitting interchange of traffic. The ruling grade is to be eased to 1 in 58.8, and the curves are to be opened to a minimum radius of 820 feet.

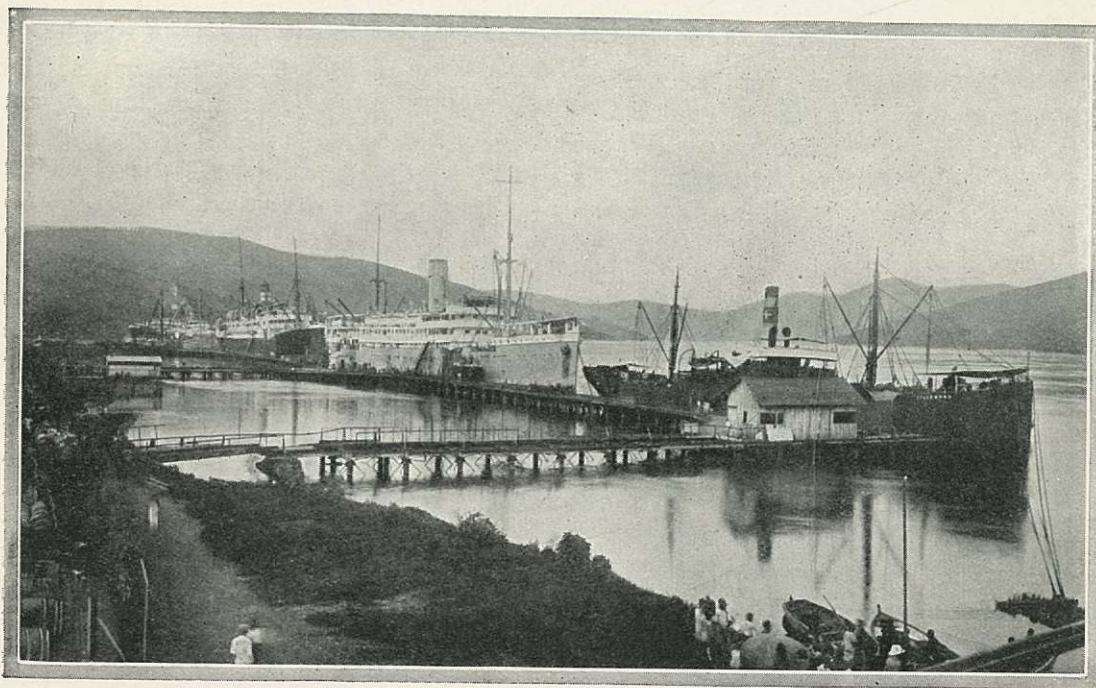
Steam is to give way to electric traction.

The necessary power is to be drawn from a hydro-electric station established upon the Inskisi River. An enormous volume of energy is awaiting exploitation, but the initial development will be for about 30,000 horse-power, with provision for extensions as the demand arises. This vast scheme of reorganization, now in progress, will take from five to six years to complete, but it will increase the carrying capacity of the railway to nearly 2,000,000 tons a year in each direction. To ensure expeditious handling of this greatly enhanced traffic at Matadi the terminal marine facilities are being remodelled and increased, the improvement including the extension of the piers by 1,640 feet.

The penetration of the Congo Basin by the steel-way ranks as one of the greatest railway-building victories of the engineer. It was the first colonial venture of its character assumed by the Belgian nation, which at the time knew nothing of the problems of colonization, and so had to profit from

its mistakes. Little was known of the country; there were no maps to guide the surveyors; topographical and geological knowledge of the mountain rim was woefully deficient. The climate was deadly, and there was necessitated a sustained unbending fight against disease in its most malignant form.

Fortunately for the enterprise, in General Thys it had a leader of indomitable courage, dogged determination, and grim tenacity of purpose, one who refused to acknowledge defeat. Finally it stands as a monument to the toil and industry of the native. The whole work was carried out by means of black labour, with the pick and shovel as the only tools for fashioning the embankments and cuttings, as well as driving through the rock. Dynamite was used but sparingly for blasting the stubborn mass of the mountains, owing to the absence of proficient drillers. But for the negro the Congo Railway would never have been built.



PIERS AND OCEAN-GOING STEAMERS AT MATADI.

Modern facilities for loading and unloading cargoes are installed at this port. The background of mountains conveys some idea of the difficult country penetrated by the railway builders.