

all competitors at the Fair, and around the lower structure was a balcony nearly 150 feet in circumference, from which an impressive idea of the height of the tower was obtainable.

THE BICYCLE UPON RAILS.

It is from Russia this time that comes to us a curious cycling apparatus. The accompanying engraving reproduces a photograph taken in the vicinity of Moscow a few hours previous to the passage of the imperial train. Some Russian gendarmes, one of whom is seated upon the apparatus, have just made an inspection of the track. The Czar may now pass, as there is nothing to be feared from the Nihilists!

As will be understood, the person in the center is utilizing a sort of bicycle for his police service which rolls upon the rails of a railway track. In reality, the word bicycle is a misnomer for this apparatus, which rests upon three wheels. Through its two principal wheels it rests upon the rail to the right, but is kept in equilibrium by a metallic arm terminating, on the rail to the left, in a small wheel. It is a crude apparatus, moreover, whose two heavy main wheels are connected by a compact body, the various parts of which are roughly shaped, and which weighs no less than 110 pounds.

As primitive as the machine is, however, it exhibits some very original peculiarities. It is actuated both by the arms and legs of the rider, and thus puts one somewhat in mind of the Valere running machine. Here, the rider, not having to occupy himself with the steering of the machine, since the latter, being fitted to the rails, follows all the curves thereof, devotes his entire attention to its propulsion. Two levers, actuated by the arms, are, through a slide at their lower extremity, connected with each of the cranks of the bicycle. It will be remarked that, contrary to the arrangement of the Valere machine, which causes its rider to take an ambling gait (that is to say, causes him to put forward at the same time the leg and arm of the same side), the Russian railway bicycle employs the ordinary gait of man's trot, that is to say, causes the rider to put forward at the same time the right arm and left leg, and reciprocally.

We shall not expatiate here upon the genuine services that may be rendered by this inexpensive and very rapid apparatus, which necessitates scarcely any cost of maintenance and which one man can easily remove from the track, in order to allow a train to pass, and afterward replace upon the rails. It is too evident that the switchmen, inspectors and engineers of railways would find it of great interest to utilize it according to circumstances.

Much is being said about military cycling; we are not so very sure whether in time of war railways would not be the only routes cyclable. We may remark, however, that this homely Russian apparatus is not an innovation, but far from it. Almost from the inception of cycling it has been understood that the railway is the most practical, the surest and best rolling roadway. The oldest example of cycling upon rails that we know of is mentioned in the *Albany Courier* of August 20, 1869, which states that upon the banks of the Mohawk, two landowners had had constructed for themselves, in order to visit their possessions, small cars that they actuated by their arms and legs upon the railways.

This journal adds that one evening, in a fit of jealousy, the two inventors ran into each other upon an embankment one hundred feet in height, in a sort of real Yankee duel, and that the cars were smashed and one of the duelists was killed outright. Without dwelling upon this perhaps fanciful story, we shall further recall that at Paris, on the 28th of December, 1887, the military engineers, represented by Capt. Houdaille, tried a railway quadricycle, constructed by Mr. Vincent, upon the line of the East, near Villette. A speed of 18 miles per hour was obtained. Unfortunately the apparatus weighed 198 pounds, and for this reason was abandoned. Afterward, Truffault, the bicycle manufacturer, who played so important a part in the history of cycling, established after the manner of the Americans a railway quadricycle that weighed but 55 pounds, and gave a speed of 24 miles per hour upon a level. The French state railways began some ex-

periments in 1891. It is now 1894, and the experiments are being carried on without any conclusion as yet. It is fortunately necessary now to rely much in France upon the example of Russia.—*La Nature*.

THEODOR BILLROTH.

One of the brightest stars in medical science—the last of the triple star—Langenbeck-Volkman-Billroth—is extinguished.

Theodor Billroth was born April 26, 1829, at Bergen, on the island of Rugen. His father, who was pastor at Bergen, died early, leaving the son to be brought up by his mother. Later he went to school at Greifs-



THEODOR BILLROTH.

walder, and in the years 1848 to 1852 he studied medicine in Greifswald, Göttingen and Berlin. He carried his studies farther than many, working as diligently at the natural sciences as at medicine.

In addition to the usual journeys to Vienna and Paris for the purpose of study, Billroth had a thorough drill in the surgical clinic in Berlin, where he acted as Langenbeck's assistant in 1853. The master soon recognized the ability of the youth in working out microscopic, anatomical and histological questions, and the importance of such fundamental investigations for practical surgery. Thus we see him here occupied chiefly with study of an anatomical and physiological nature, and with experimental pathological work which paved the way for a new era in surgery. With wonderful adaptability he studied many subjects during his seven years in Berlin. Embryonic studies led him to an understanding of the development of the blood vessels and a careful study of unhealthy formations. He also produced at this time an excellent work on "Umwandlung von Muskel- und Nervengewebe" ("Transformation of Muscle and Nerve Tissue"), an historical study of the treatment of gunshot wounds from the fifteenth century to the present time, and his "Beiträge zur Pathologischen Gewebelehre" ("Contributions to the Science

of Pathological Histology"), an especially important work that brought to light much that was new.

It took him only ten years to rise from the position of student to that of professor and scientist. In 1859 he was called to Greifswald as professor of pathological anatomy. Fortunately for surgery, he refused this flattering call, but two years later he accepted a call as professor and director of the surgical clinic in Zurich. He left here in 1867 for a similar position in Vienna. When in the Swiss high school his great industry and brilliant surgical talent showed to advantage, and his methods of work here, following up the questions of the day in his studies and his teaching, are set forth not only in his "Clinical Reports," but also in his "Fifty Lectures on General Surgical Pathology and Therapeutics," a work of classical value and universal importance that lived through many editions and was translated into all civilized languages. In Vienna he continued to publish his experiences in "Clinical Reports," and he and Pitha produced the great compilation "Handbuch der Allgemeinen und Speciellen Chirurgie" ("Handbook of General and Special Surgery"), which is prized by physicians in all parts of the world as a mine of surgical experience.

Lister's epoch-making discovery of the use of antiseptics in operations, which opened to surgery heretofore unsuspected paths, was not without its effect on Billroth. He was one of the first in Germany to acknowledge and appreciate the importance of the antiseptic method. With his accustomed zeal he undertook the study of the suppression of surgical fevers and diseases, but he was not tempted even by his great success to perform unnecessary operations. Step by step he followed up carefully the branch of surgery which had been so suddenly opened, and we have to thank him for many operations in internal surgery that are of the greatest importance in saving life, and such as no one had dared to perform before. Among these we may mention the removal of the larynx and the resection of the pylorus end of the stomach, which added new leaves to his crown of laurel. This was before the time of Koch; but Billroth was then a pioneer. By his work on the vegetable nature of the septic coccus bacteria, he increased the knowledge of wound infection so that he might be called the apostle of antiseptic surgery.

His ability in two other branches should be mentioned here, viz., that of military surgery and popular authorship. As a result of his voluntary service in the Franco-German war, he presented the medical world with "Chirurgischen Briefen aus den Kriegslazarethen von Weissenburg und Mannheim," 1872 ("Surgical Letters from the Hospitals of Weissenburg and Mannheim"), as well as with his dissertations on the transportation by railroad of those wounded and taken ill on the field (1874). As a teacher of the people he published, in 1881, a handbook on "Die Krankenpflege im Hause und im Hospital" ("Care of the Sick at Home and in the Hospital"), that has been universally translated, and shows how a true German savant can present questions of hygiene in a form that is agreeable and at the same time comprehensible to the uninitiated.

Billroth has taught many famous pupils, and the students' thorough appreciation of his ability as a teacher is shown by the document which they presented to him on the occasion of the anniversary of his fiftieth term at Vienna (1892). In his "Lehren und Lernender Medicinischen Wissenschaften" ("Teaching and Learning Medical Science"), 1876, he made a valuable gift to those who are interested in reform in medical instruction.

Billroth was a person of the greatest charm; his finely formed head, clear eye, and brilliant oratorical gifts will long be remembered by all who knew him. He was a real "pathfinder" for his associates, his bold and successful methods of performing operations restored thousands of suffering people to health, and being extremely self-sacrificing and magnanimous, he was a true benefactor to the sick and a fatherly friend to the student.—*Illustrirte Zeitung*.

THE strongest animals in the world are those that live on a vegetable diet. The lion is ferocious rather than strong. The bull, horse, reindeer, elephant and antelope, all conspicuous for strength, choose a vegetable diet.



BICYCLE FOR THE INSPECTION OF RAILWAY TRACKS.