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The Editor is always glad to receive for examination illustrated articles on subjects of timely interest. If the photographs are sharp, the articles short, and the facts authentic, the contributions will receive special attention. Accepted articles will be paid for at regular space rates.

## ENGLISH CARS IN RAILROAD WRECKS.

The photographs which have been published of what was left of the London and South-Western special boat train after the fatal wreck at Salisbury, furnish additional proof of the exceedingly light construction of English passenger cars. To American eyes, the frailty of construction revealed in these photographs is truly astonishing. Not one of the many pictures which are published from time to time of the more serious railroad disasters in this country, reveals such a complete disintegration of the cars as occurred in this Salisbury derailment. The strength and security of the American Pullman car are proverbial, and it will pass through ordeals even more severe than that at Salisbury, with a surprisingly small amount of injury. Indeed, it was not so very long ago that we published in this journal photographs of a car which, after leaving the rails, rolled completely over down an embankment and landed right-side up with no structural injury that was not quickly repairable.

Undoubtedly, the great strength and weight of the American car and the relative lightness and weakness of the English car are the outcome of the conditions under which the railroad systems of the two countries have been developed. The vast distances to be covered in America; the impossibility, because of the prohibitive cost, of building the pioneer railroads of first-class construction; the poor character of the signal system; and the consequent frequency and serious nature of the derailments and collisions, rendered it necessary, early in the development of our railroads, to build the rolling stock of great strength and weight. Moreover, the adoption of the swiveling truck placed at each end of the car, as distinguished from the rigid axles distributed along the length of the car in the English and Continental system, made it possible in America to construct the cars of much greater length than was possible in Europe; and with the increase in length, it became necessary to make a proportionately greater increase in the strength. These two causes combined are answerable for the weight and strength of the American passenger car of to-day, and the development has been pushed to such a length, that the latest passenger Pullman cars weigh between sixty and seventy tons apiece, which is more than the weight of many of the passenger locomotives of the present day.

In England and on the Continent, development of the railroads took place after the population had grown to a density which guaranteed a heavy freight and passenger traffic immediately upon the opening of the roads, and warranted the construction of the road-bed, track, and bridges, upon a scale of solidity and excellence which was impossible in building the pioneer railroads of America. Not only so, but early in their history, an excellent system of safety signals was adopted, and travel was thus rendered relatively safe. The excellent road-bed, heavy track, and comparative absence of curvature made it possible for the English engineers to use the rigid axle and short length of car; hence it was not necessary to build the cars on such massive lines as here in America. English rolling stock has always appeared to be remarkably light as compared with the rolling stock in America. Thus, in the largest Pullman cars, between 2¼ and 2½ tons of dead weight must be hauled for each passenger carried; whereas in the heaviest English cars, the proportion will be only from 1¼ to 1½ tons to the passenger; and in the majority of the rolling stock, which is of the older rigid-axle type, the dead weight will work out at from one-third to one-half of a ton per passenger. When English railroad officials have been charged with building their cars, too light to stand the shock of collision or derailment, they have retorted that their rolling stock is not designed for collision, but for normal operation on properly built and operated roads, and that the number of accidents is so exceedingly small that they would not be warranted in allowing the very limited risk of

such accidents to impose an unnecessary burden of weight upon the cars. They furthermore reply in answer to our criticism, that it would be better for us to decrease somewhat the weight of our rolling stock, which is not only costly to build, but exceedingly costly in the wear which it causes upon track, bridges, etc., and invest the money so saved in extending our block signal service until it embraces the whole of our railroad system.

We are inclined to think that the best type of car with respect to weight and strength lies somewhere between the over-light English car and the over-heavy American Pullman; and we are satisfied that the solution of the problem will be found in the adoption of the all-steel system of construction. Up to the present time, in the steel cars which have been built for various railroads and different classes of service, the saving in weight over similar cars made of wood has been rather disappointing; but we are of the impression that the designers have been over-conservative in reducing weights, and have been unduly influenced by the massive proportions which have characterized wooden construction. If the same scientific analysis of the stresses to which a railroad car is subjected were applied to its design as is used in the design, let us say, of bridge structures, we believe that a considerable reduction of weight, without any sacrifice of strength, would be secured.

## EARLY OPENING OF NEW YORK CENTRAL ELECTRIC SERVICE.

The determination of the New York Central Company to hurry forward the installation of the electric service, at least through the Park Avenue tunnel, is highly commendable, and will be exceedingly welcome to everyone who has occasion to travel by way of that notorious two miles of discomfort. If one were to judge by the apparently backward condition of the new terminal itself, it would look as though the opening of the new electric service were yet many years removed; but the company has wisely determined not to wait upon the completion of the Grand Central Station. They propose to complete the excavation of the easterly half of the station yard; create a temporary terminal at the Grand Central Palace, and start the operation of trains by electric power over the first few miles of road out of the city, just as soon as the new power station at Port Morris is in condition to supply the current.

The time set for the opening of electrical service from the Grand Central Station to High Bridge on the main line, and to Wakefield on the Harlem division, is the middle of October. The laying of the third rail and placing of the cables is well on the way to completion; already two of the 85-ton electric locomotives have been delivered, and they will be set in service on a stretch of experimental track at High Bridge, where the engineers will be broken in to their new duties as motor-men.

One hundred and twenty-five steel electric motor cars and 55 trailers have been ordered, and the first installment will shortly be in the city. At the Port Morris power house, one of the turbine generators has been put in operation, and another is nearly completed. By October 15th the divisions from Harlem and Wakefield to Forty-second Street will be in condition to commence active operation, and as the months pass by, the electrical equipment will be extended, both as regards the line and the rolling stock, without waiting for the completion of the great terminal station, whose construction can be carried forward without interference in the operation of the trains.

The equipment of the New Haven system is also being pushed vigorously; the concrete piers for the towers which will carry the overhead line are nearly all in place, and the power station, which is being built at Cos Cob to supply the system from Woodlawn to Stamford, is now about one-half completed. The New Haven electric locomotives will use the overhead system from Stamford to Woodlawn, from which point into the Grand Central Station they will take current from the third rail of the New York Central system.

## THE FIRST FOREIGN SALUTE OF THE AMERICAN FLAG.

The question raised by a correspondent on another page of this issue as to when and where the American flag was first saluted by a foreign government, is one which has been the subject of considerable controversy; although the actual facts of the case are, and for some time have been, well known to careful students of American history. It is popularly supposed that the first salute was given to the American warship "Ranger" when she was under command of Paul Jones, and that the event occurred in 1778. On the other hand, it has long been known to students of history that two years earlier a salute was given to the American flag by the governor of one of the Dutch West India islands. The confusion has arisen from the fact that prior to the adoption of the stars and stripes as the national emblem, the colonies had adopted another flag in which the stars did not appear. It was the earlier flag which was saluted in 1776; while Paul Jones is quite correct in stating that the first foreign salute to the stars and

stripes was given to the little war vessel "Ranger" while she was under his own command.

The necessity for the adoption of a common national flag does not seem to have impressed itself upon the American colonies until toward the close of the year 1775, when a committee consisting of Dr. Franklin, Mr. Lynch, and Mr. Harrison was appointed to consider this subject. They met at the camp of the Colonials at Cambridge, and proposed the adoption of a flag which should retain in the corner the King's colors or Union Jack, consisting of the combined crosses of St. Andrew and St. George, thereby representing the still recognized sovereignty of England; but that the field of the flag should consist of thirteen stripes alternate red and white, which should be emblematic of the union of the thirteen colonies against the tyranny and oppression of the King. The new flag was adopted, and it was first hoisted on January 2, 1776, the event taking place at the Continental camp at Cambridge. This flag is known as the Continental Union flag.

The first vessel to receive a salute for the Continental flag from a foreign power was the little brig "Andrea Doria," commanded by Capt. Robinson. This vessel was purchased prior to the adoption of the new national emblem, and she had seen active service under Nicholas Biddle. In September, 1776, she sailed from Philadelphia for the island of St. Eustatius, to take aboard a cargo of arms. On her arrival at that port on November 16, 1776, she saluted the Dutch flag, and her salute was returned by the governor, De Graaff, with thirteen guns, corresponding to the thirteen States. The gallant governor bid fair to pay dearly for his enthusiasm; for Mr. Christopher Greathead, who commanded the British island of St. Kitts, hearing that a certain North American vessel had been supplied at St. Eustatius and had saluted the Dutch fort of Orange, and that the fort had replied, remonstrated against this insult to his Britannic Majesty. Proofs of this salutation were sent to Sir Knight York, English Ambassador to the Dutch Republic, and he laid them before the high and mighty States General, and demanded a formal disavowal of the salute and the discharge and recall of De Graaff. The governor was cited to appear before the States General; but he delayed doing so, and when he eventually reached Holland in 1778, France had acknowledged the independence of the American colonies, and other nations soon followed. The offense of De Graaff was no longer a solitary one, and the complaint against him was lost sight of and forgotten.

In 1776 a pamphlet was published in Concord, N. H., entitled "The Stars and Stripes the Flag of the United States of America—When, Where, and by Whom was it First Saluted," in which the writer proves the fact of the salute in the West Indies, and speaks of it as a "salute of the stars and stripes." This, as we have shown above, was an error, the stars not having been added to the flag until the following year.

It was on June 14, 1777, that the American Congress resolved that the flag of the thirteen united States should consist of thirteen stripes alternate red and white, with thirteen stars, white in a blue field, representing a new constellation.

Paul Jones claimed that it was his good fortune to be the first to display the stars and stripes on a naval vessel, and it had previously been his to hoist with his own hand the "flag of America" on board the naval vessel "Alfred." He was appointed on June 14, 1777, to the command of the "Ranger," which carried a battery of sixteen six-pounders. He crossed the Atlantic, and on entering Quiberon Bay, on the 14th of February, 1778, he saluted the French fleet under Admiral La Motte Piquet, and received in return a salute of nine guns. This was the first foreign salute of the stars and stripes; and the subject has been commemorated in the paintings and engravings with which the public is generally familiar.

## THE PRODUCTION OF PRECIOUS STONES IN 1905.

While the United States may never lead the world in the production of gems, the value of its output of precious stones in 1905 reached the very respectable figure of \$326,350.

The largest output is from the sapphire mines, the yield of which amounted to \$125,000. Next in value are the turquoise, quoted at \$65,000. Then come the tourmalines worth \$50,000. Peridot, crystal quartzes, and miscellaneous stones are accredited with a value of \$10,000 each. The production of aquamarines is valued at \$6,000, of kunzite, gold quartz, chrysoptase, silicified wood, and garnet at \$5,000 each, of smoky quartz and chlorastrolite at \$3,000 each, of amethyst, agate, pyrite, malachite, anthracite, and catlinite at \$2,000 each, of moss agate at \$1,500, of beryl, rose quartz, Amazon stone, and arrow points at \$1,000 each, of topaz, utahlite, and mesolite at \$500 each, of fossil coral at \$250, and of dumortierite in quartz at \$100.

Mr. George F. Kunz, who has prepared a report entitled, "The Production of Precious Stones in 1905," which will soon be published by the United States Geological Survey, is authority for these figures.