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SCIENTIFIC AMERICAN SUPPLEMENT

No. 1081.

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THE BICYCLE IN ITS RELATION TO GOOD ROADS.

The successful transmission by bicycle relays of a war message and a post office dispatch across the continent, the details of which are given in another column, will always remain as a notable event in the annals of transportation. While the thirteen days consumed on the journey are full of dramatic interest, the performance itself was something more than merely spectacular; it has, as it was intended to have, a serious and practical value.

In the first place, the average speed of the relay, without taking into consideration the question of the roads and the weather, was highly creditable. It figures out as eleven miles an hour for the whole distance; and this speed was maintained night and day for nearly a fortnight, across three thousand four hundred miles of country, and involved the co-operation of over two hundred riders, with just as many transfers of the package, many of which were made remote from any habitation and in the dead of night. The speed would have been creditable even if maintained for a similar distance upon a continuous stretch of turnpike roads, and in favorable weather.

To appreciate the performance at its proper value it must be remembered that not more than one-fifth of the journey was made over roads that could be termed first class; that much of it took place over unballasted country dirt roads; and that for many hundreds of miles the riders had to wheel along the old emigrant trails which, fifty years ago, carried the ox team of the pioneers into the far West. Moreover, some hundreds of miles of the steepest hill climbing were encountered in the Sierra Nevada and Rocky Mountains, where the passes lie some seven thousand and eight thousand feet above the sea, and the surface of the mountain grade is roughened and rendered perilous by "washouts," loose rock, and gravel. To the difficulties arising from poor roads must be added those due to the weather, which on several days and nights was marked by rain storms, which turned the poor roads into mud, and rendered fast travel on the good roads impossible.

Taken altogether, this performance has lifted the bicycle once and forever out of the arena of mere pastime, and has established its economic value as a reliable means of transportation under the roughest conditions. It has proved its ability to carry an emergency dispatch over good roads for hundreds of miles at a speed rivaling that of any but the fast railroad trains, and it has shown that it can perform the same service over precipitous mountain trails, day and night together, at a speed which no relay of horses dare attempt.

In its bearing upon the science of war the transcontinental relay comes in as a strong vindication of the efforts of such soldiers as General Nelson A. Miles, who hold that the bicycle is destined to play an important part in military operations. It is now clearly proved that a system of military bicycle relays may be strung out, if need be, for thousands of miles, and that dispatches can be delivered from the Pacific to the Atlantic in but twice the time occupied by the regular mails; since it is certain that with such military roads to traverse as are to be found in France and Germany, the time of crossing the continent could readily be reduced to ten days.

While it is admitted that the chief lines of military communication in time of war will be the railroads and the telegraph, there will be many occasions when these will not be available; as, for instance, where they have been destroyed by the enemy in its retreat, or by a dash of cavalry upon the lines of communication. In such cases a trained bicycle corps could very rapidly establish a system of relays which, over good roads, could transfer dispatches at a speed of twenty miles an hour. Moreover, it frequently happens that two divisions of an army may be so placed that there is no direct railroad communication between them; whereas cross country roads can usually be found which would be available—as the recent transcontinental race has clearly shown—for the speedy establishment of a bicycle relay.

It should further be noted, in judging the value of the performance in question, that the relay was composed mainly of amateur riders, to whom the exertion of riding their relay, in such weather as they encountered, was a novel experience. In the case of a military relay of this kind the riders would all be professional men, trained for the work, to whom a ten mile ride at full pressure over rough roads and in driving rain would be nothing new; and from such a trained corps it would be reasonable to look for even better records than were accomplished in the recent memorable ride.

Perhaps the most important effect of this transcontinental relay is that it has shown in a most dramatic manner the necessity for better roads. The message was carried for hundreds of miles over what are known as dirt roads, which are periodically plowed and thrown up by farmers through whose lands they run. In dry weather they are deep in dust, which in wet weather is turned into slush and mud. Careful estimates have shown that the cost of a few years of this "tinkering" would suffice, if properly applied, to turn these highways into first class macadamized roads, whose maintenance would entail but a tithe of the cost and labor which is being fruitlessly expended in the present methods.

THE AMERICAN CAR ON ENGLISH ROADS.

The intense rivalry between the East Coast and West Coast routes from London to the north of Scotland has led the officers of the companies which cover the former route to make a special bid for the summer travel this year. This did not come, as was expected, in the shape of an increase of speed, the running time of the rival roads being about the same this year as last; and though there are many features which indicate that the famous annual race will take place before the season is over, there is no evidence of it at the present writing.

The special attraction of the East Coast route consists of a complete train of eight long and heavy cars built upon the lines of the typical American car, and furnished with all the various details of equipment which characterize an express passenger train in this country.

How wide a departure has been made from the common English practice may be judged from the following particulars: The train is made up of eight cars of an average length of 67 feet, their weight being not far from 40 tons. This is more than double the length and weight of the standard English six wheeled coach. The cars are carried on six wheeled trucks. The Railway World (English) in describing the train says: "The train forms a compact whole, as the separate carriages are joined by the patent Gould combined vestibule, automatic coupler, buffer, and continuous platform, the side buffers and screwup couplings being abandoned in favor of appliances which have long been used in America. In fact, the train indicates throughout the triumph of American ideas." The cars are fitted with the raised clerestory roof, patent torpedo ventilators, double gas lights, Gould's steam heating apparatus, together with electric calls from each compartment. The English preference for privacy is shown in the retention of the compartment division of most of the cars, there being only one third class open car, with doors at each end and a passage down the center. The rest of the cars are called "composite corridor carriages," and each contains three first class and four third class compartments, a baggage room, and lavatories for each class. There is also a large baggage car with six wheeled trucks. The total length of the train is 530 feet, and it will carry about 300 passengers.

The weight of this train per passenger, however, is far greater than that of a train of the standard English cars, as was to be expected, and just here we find an explanation of the remarkable increase in size and power which is noticeable in this year's locomotives built for the Great Northern and Northeastern Companies. The former have turned out some grand locomotives on the general lines of Mr. Sterling's famous 8 foot driver singles, which have 19 by 28 inch cylinders and 8 foot 2 inch single drivers. Mr. Worsdell has also built some big machines with 20 by 26 inch cylinders and 7 foot 7 inch four coupled drivers, a full description of which will be found in our issue of August 22.

International Catalogue of Scientific Literature.

The international conference under the auspices of the Royal Society has been in every way a success from a scientific point of view, according to the London Electrical Engineer. The new catalogue is to begin with 1900, is to be in English, and is to relate to "pure" science only, applied science being excluded; but the limits are to be decided hereafter. In indexing according to subject matter regard is to be had, not only to the title of a paper or book, but also to the nature of the contents. Moreover, the catalogue is to comprise all published original contributions to the branches of science indexed, whether appearing in periodicals or in the publications of societies or as independent pamphlets, memoirs or books. The final editing and publication of such a catalogue is to be intrusted to a central international bureau acting under the direction of an international council, which will be responsible for the administration of the enterprise. Any country, however, which shall declare its willingness to undertake the task is to be intrusted with the duty of collecting, provisionally classifying and transmitting to the central office, in accordance with rules laid down by the international council, all the entries belonging to its scientific literature. The central bureau is to be in London.

Inland Shipping in Germany.

Improvements on the Oder have caused the amount of shipping at Breslau to increase from 125,000 tons in 1880 to 1,550,000 tons in 1894. The chief ports for inland shipping are Berlin, over 5,000,000 tons in 1894; Hamburg, 4,160,000 tons; Duisburg on the Rhine, about 4,000,000 tons; Mannheim, 3,662,000 tons; Magdeburg, 1,650,000 tons. All others have less than 1,000,000 tons.—Uhland's Wochenschrift.