

Scientific American.

ESTABLISHED 1845.

MUNN & CO. Editors and Proprietors

PUBLISHED WEEKLY AT

No. 361 BROADWAY, NEW YORK.

O. D. MUNN.

A. E. BEACH.

TERMS FOR THE SCIENTIFIC AMERICAN.

One copy, one year, for the U. S., Canada or Mexico. \$3 00
One copy, six months, for the U. S., Canada or Mexico. 1 50
One copy, one year, to any foreign country belonging to Postal Union. 4 00

The Scientific American Supplement

is a distinct paper from the SCIENTIFIC AMERICAN. THE SUPPLEMENT is issued weekly. Every number contains 16 octavo pages, uniform in size with SCIENTIFIC AMERICAN.

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NEW YORK, SATURDAY, DECEMBER 10, 1892.

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THE DANFORTH CASE.

Danforth was an assistant engineer on the U. S. S. Philadelphia on a recent voyage. On the morning of November 5, he was in charge of the engine room and engaged in testing the capstan steam pipe with steam up. While his men were distributed at their stations here and there among the machinery, the master-at-arms, a subaltern in the marines or police of the ship, suddenly appeared, and, without a word to Engineer Danforth, forthwith arrested one of his machinists under orders from the deck, when Danforth interposed, insisting that an engineer in charge should be informed that one of his men was to be taken from his post, so that he could put another man in his place.

"I sent him word that I was testing the capstan steam pipe and would come just as soon as I could find some one to relieve me. Then a peremptory order came and, leaving everything, I went on deck. Within an hour after I had, with perfectly honest intentions and a conscientious belief that I was doing my duty, sent the message to the officer-of-the-deck, I had been reported in writing and had been refused any opportunity to make an explanation to any one of the three officers who were to make and forward the reports against me."

This testimony was not impeached before the court martial nor was it denied that Danforth is a faithful and efficient officer, his record being, up to now, without blemish. Notwithstanding this, the jury, composed it should be said for the most part of line officers, brought in a verdict against him; the Secretary of the Navy approving the same and condemning the engineer to a year's suspension on half pay.

The case has excited much interest throughout the service; the engineer officers, or at least those who have expressed their opinions in the public prints, looking upon the verdict as unjust and unmerited; though only what might have been expected from a strict application of the old cast iron rules to what must be regarded as altogether new conditions.

It is time this kind of thing was put a stop to, or, if the old rules must stand, that a little common sense be mixed with them.

GOOD ROADS.

The subject of good roads is now occupying a great deal of attention on the part of the public. The American nation appears to be gradually awakening to the fact that the bad roads of this country are unworthy of its position among the nations. We learn what bad roads bring about when we read of mud blockades. Large districts of country are rendered impassable by mud. Almost an entire State is brought into a condition of siege by the muddy roads. The farmers cannot transport their produce, the railroads lose freight, and the speculators seize the opportunity to advance prices of produce.

This is what a mud blockade may mean. The State or region directly affected, the railroads traversing it, and the country at large may all suffer for it. To avoid such occurrences we need no lessons from modern times. It is true that the nations of Europe put us to the blush. But we may go back two thousand years for our instructors. The Roman engineers won their fame largely as road makers. The roads which they built are to-day their monuments.

Thus we find ourselves very archaic in the matter of roads. It is stated that in Illinois alone the loss to the community from bad roads last year was as much as \$16,000,000. If this ratio were taken for the whole country, it would give a loss of \$300,000,000. At three per cent such loss would represent a capitalization of ten thousand millions of dollars. This is one-sixth of the total wealth of the country.

The subject of deserted farms has been a subject of concern in the New England States. A farm whose outlets in the spring and fall months are but canals of mud and cobblestones is justly unattractive to the young. They find the enforced isolation unendurable. But replace the bad roads by macadamized or telfordized surfaces, which do not feel the spring thawing and which are always passable, and which are dry a few hours after a rainstorm, and the country will take on a new aspect.

The agitation for good roads was originally undertaken by the League of American Wheelmen. This is an association of bicyclists. On bad roads the bicycle rider is at a great disadvantage. Doing his own propelling, he quickly appreciates a change in the road

surface. The agitation began to spread. The carriage builders have justly felt that good roads would give them an enlarged market, and have joined the movement. The subject has been lifted up from the limited bicyclist's platform to a national one. A bill has been presented before Congress looking to the establishment of a national highway commission. Special laws have been passed by States for the construction of roads. The effect of such laws has already been widely felt. The formation of a national association for the encouragement of the building of good roads has been effected. The probabilities are that the next ten years will see a great change—almost a revolution. The era of bad roads is certainly approaching its close.

A CARRIAGE BUILDERS' SCHOOL.

The National Association of Carriage Builders held their 20th anniversary recently in Buffalo, New York. Among the subjects treated a particularly important one, and interesting in view of the general movement for the advance of technical education, related to the establishment of a carriage builders' technical school. For some time past a school has been maintained in New York City for the education of young men employed in the carriage factories, apprentices and mechanics who work during the day. These young men gave three nights each week in the carriage builders' school to learn carriage drawing. This is the work that has been done. The Carriage Builders' Association, however, felt that more was required, and advocated the establishment of a true technical school.

As the representative of practical technics in this vicinity the Stevens Institute at Hoboken afforded an obvious opening for the foundation of such a course. The Institute for many years has graduated from its curriculum engineers in the true, practical sense of the term. Its graduates are not only familiar with the mathematics of the subject, with the theory and scientific aspect of their work, but are also practical workmen when they leave it. Special provision is made for giving them a course in practical mechanics, so that they may learn the absolute use of tools. After they leave the college there is no need for them to spend a year or more in the shop. This part of their education is included in their college course.

The faculty of the college have taken a special interest in the carriage builders' school, such as it is. It seems very natural, therefore, that by a slight addition to its force, the Stevens Institute of Technology might supply the needed college for carriage builders. Evening classes in drawing and designing should be kept up for the benefit of workmen and apprentices. Instruction in connection with the regular course in drawing and descriptive geometry would be included in such lines as are required in carriage building. Under applied mechanics the application of the principles of statics and dynamics to suitable problems in carriage building would be given. In shop work the joints used in carriage construction and the tempering of springs are two suggested topics. In the experimental course special examples in testing the strength of springs, joints, and frames would be introduced.

Such in general, with added lectures by specialists, is the programme as suggested by Dr. Henry Morton, the President of the Institute. To carry it out, money is required, and the collection of such money is now being attended to by the association, and they seem to believe that they will succeed in raising sufficient capitalization to enable the Stevens Institute of Technology to establish the special course designed.

The situation of the Stevens Institute of Technology is particularly available, being so readily reached by ferries both up and down town in this city. Its peculiar fitness as a center of such instruction has been already explained. A carriage builders' school established there will have the advantage of a score of years' preceding work done at the Institute, for into the work of the course will enter the experience of the entire faculty. The work done by a regular student in that department will to a great extent be the same as that done by all, so that he will receive the full benefit of the plant of the Institute and of the long years of work of its faculty.

Carriage building is rapidly developing and bids fair to become a true profession. The past year has witnessed remarkable results obtained by the introduction of ball bearings and pneumatic tires on racing wagons, and it is hard to believe that the day is not near at hand when vehicles of luxury will be thus equipped. In the structural department electricity is already playing a part in the welding of tires and in the welding and brazing of joints in general. All this indicates the invasion of the old field of handiwork and apprenticeship by the highly trained mechanic and technologist. The carriage factory may yet be called upon to supply electrically propelled vehicles. Many experimental vehicles of this type have indicated the possibility of future success. In the use of oil fuel and of naphtha engines there is also a possibility for the future. In carrying out these and many other impending changes the educated technologist will find in carriage building full scope for an engineer's education.