

# SCIENTIFIC AMERICAN

[Entered at the Post Office of New York, N. Y., as Second Class Matter. Copyrighted, 1887, by Munn & Co.]

A WEEKLY JOURNAL OF PRACTICAL INFORMATION, ART, SCIENCE, MECHANICS, CHEMISTRY, AND MANUFACTURES.

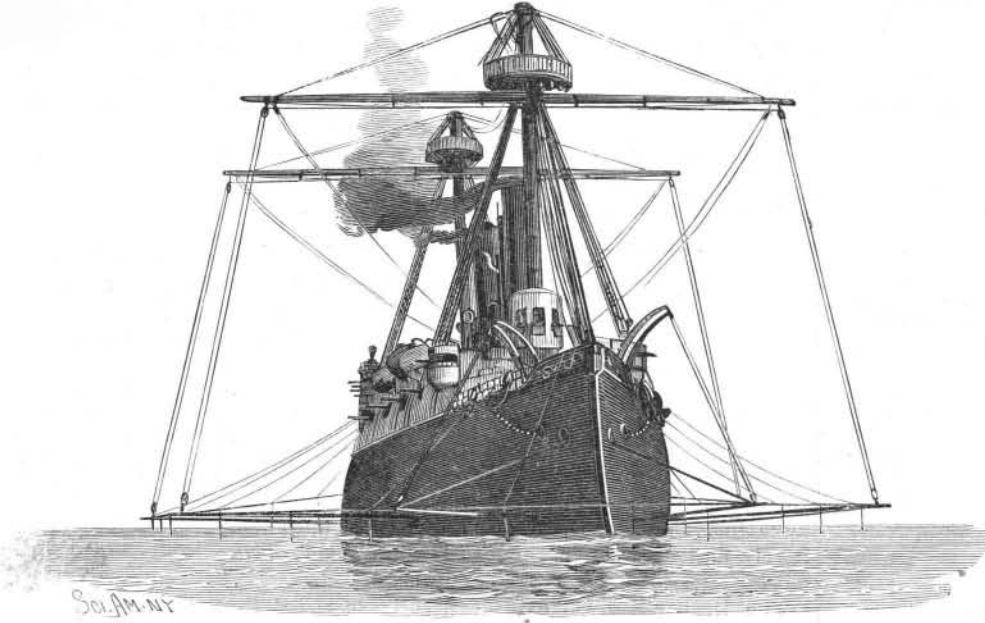
Vol. LVII.—No. 17.  
[NEW SERIES.]

NEW YORK, OCTOBER 22, 1887.

[\$3.00 per Year.]

## A TORPEDO BOAT FLOTILLA ATTACK THE ATLANTA.

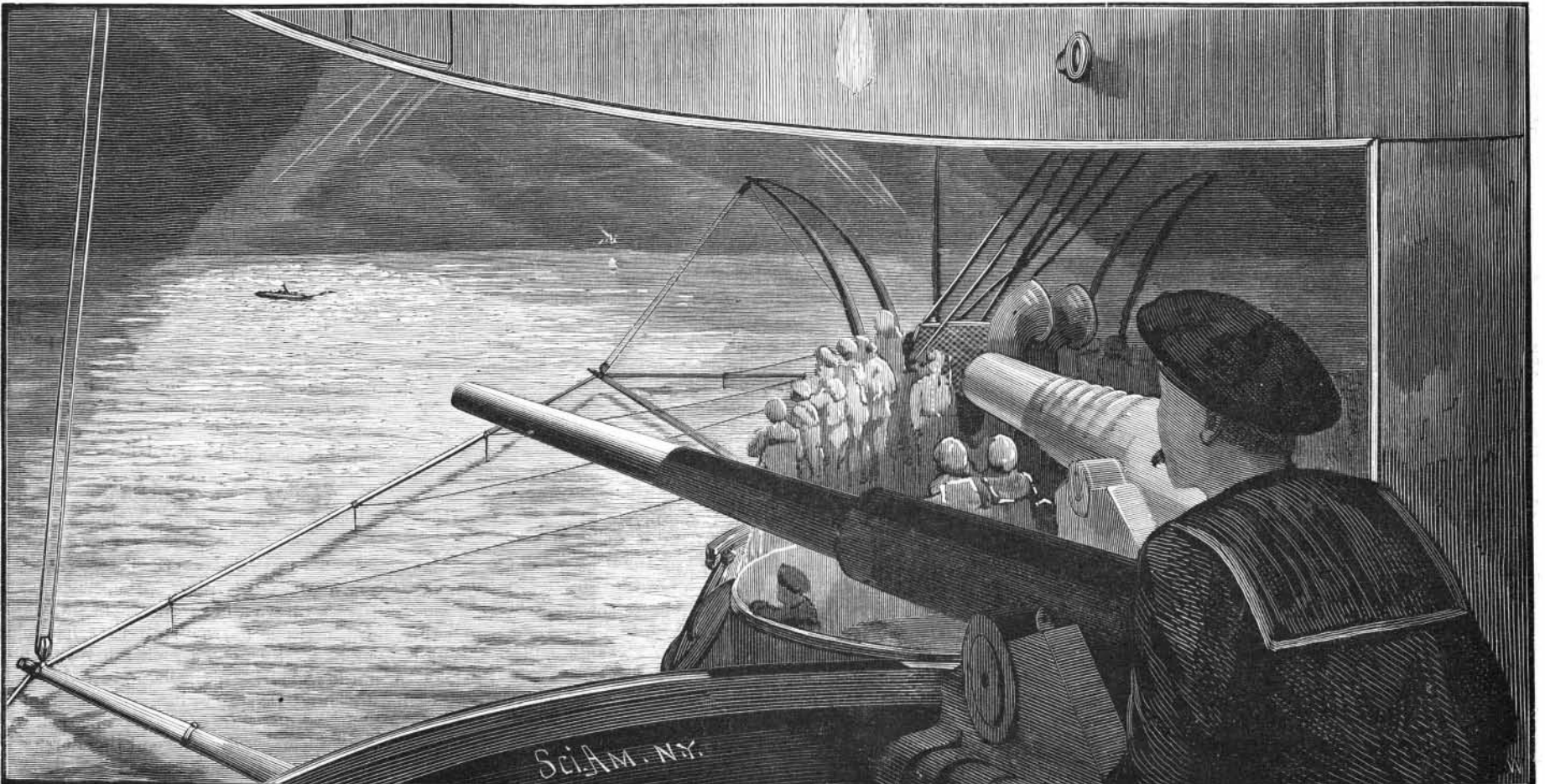
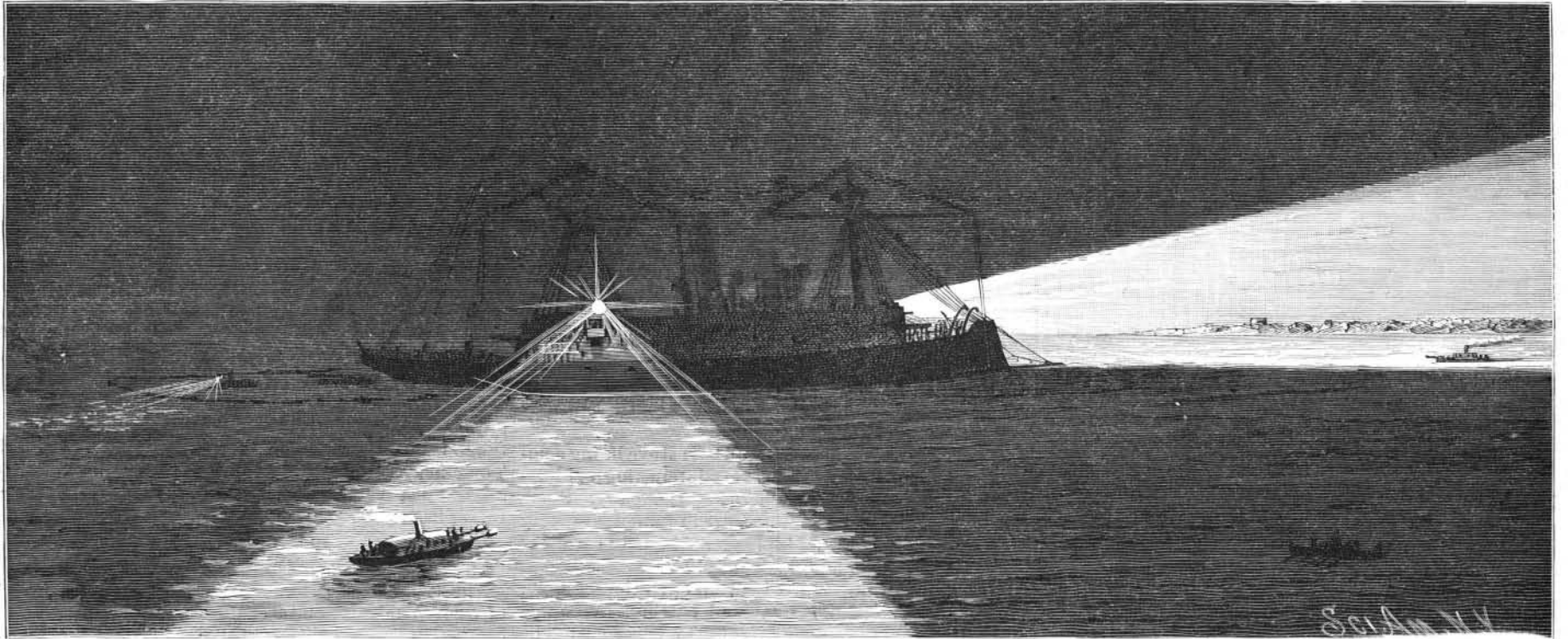
A sham battle, intended to illustrate the conditions of modern naval warfare, and the means which the most improved ironclads have for defending themselves against the attacks of torpedo boats, came off at Newport, R. I., on the night of October 11, according to a prearranged plan of Admiral Luce, of the North Atlantic Squadron, and a board of officers. The new cruiser Atlanta, which, with the Richmond, the Dolphin, and other vessels of the squadron, had arrived at Newport, was made the target of a supposititious attack by the steam launches, cutters, whaleboats, and gigs of the other vessels of the squadron, simulating torpedo boats. The Atlanta was defended by her own resources and such improvised



additions as her officers could make effective.

According to the plan arranged for the fight, approaching boats were to be ruled out of action and retire when discovered by the Atlanta in time to be under the fire of heavy guns long enough to receive three rounds therefrom, or under a Gatling gun fire within five hundred yards for a minute and a half, or under a small arms fire for the same time, or under an effective fire during fifteen seconds while within the beams of the search lights, or be within effective range of a defense torpedo at the time of its possible explosion by the Atlanta. Any torpedo boat succeeding in attaching an explosive charge to any part of the defense, or any torpedo boat which, without being dis-

(Continued on page 258.)



A SHAM BATTLE AT NEWPORT—THE ATLANTA PREPARED FOR ATTACK; USING THE SEARCH LIGHTS; VIEW FROM A PORTHOLE.

### A TORPEDO BOAT FLOTILLA ATTACK THE ATLANTA.

(Continued from first page.)

covered, should approach the Atlanta to within twenty feet was to be considered as having successfully torpedoed her. If the Atlanta was torpedoed once, she was to be considered as disabled, and if torpedoed twice, as destroyed.

The night of the attack was a dark one, but the sea was smooth, although the tide ran pretty strong against the attacking boats, which were all numbered, provided with especial signals, and assigned distinct posts in the general plan of offensive operations. The defense was really only expecting an attack by the steam launches, but a large number of other boats participated. There were umpires on each boat, as well as on the Atlanta, to judge of the events connected with the engagement, and the attacking boats were to keep in ambush under the cover of neighboring islands, so that they might simultaneously approach the Atlanta, under cover of the darkness, from different points of the compass.

The preparations on board the cruiser for receiving the attack included the sending down of everything aloft except the lower yards, the rigging and gear being securely lashed, and the vessel looking almost dismantled, as is the characteristic appearance of modern war ships prepared for an engagement.\* The captain of the Atlanta, in the afternoon preceding the engagement, moved his vessel further seaward, and took a new anchorage in the outer harbor of Newport, thus giving the cruiser a more effective position for defense, in a way that good judgment would indicate in a case of actual hostile attack. A stout five inch steel hawser was passed around the ship, just high enough above the water to prevent a hostile boat going over under it, and this was guyed clear of the ship by the unrigged spars, the topsail yards being used to starboard and the topmasts to port. These were supported by tackles from the lower yard-arms. Two spare booms were rigged forward twenty-four feet outward, and to these were attached a secondary steel hawser that encircled the ship from stem to stern. Upon the main hawser, at distances thirty feet apart, were suspended torpedoes, each controlled electrically, and so arranged as to fire on a closed circuit by contact, and with such a radius of fire that any boat striking the hawser was exposed to the destructive action of one or two torpedoes at a distance not exceeding fifteen feet. Towing astern was a whaleboat carrying a steam hose in such position that a stream of hot water could be directed against any approaching boat, there being another method of also employing this means of defense forward, and it being provided that an attacking boat was to be ruled out should it receive water from this hose during a quarter of a minute. Fifty yards astern of the ship a hawser was anchored carrying spare buoys and buoyed by empty water casks, with ropes, intended to entangle the screws of the attacking launches.

The principal defense of the Atlanta, however, consisted in her search lights and the ready means of training her guns in any direction which might be necessary. The two lights were mounted, one aft on the starboard and one forward on the port side, and their twenty-four inch lenses were so arranged that the sixteen thousand candle power developed was flashed out in any direction desired, close to the water, and with a range of over fifteen hundred yards. The vessel itself appeared to be in total darkness, but the brilliant rays of light sent far out over the water all around it by these lights, as they were thrown first in one direction and then another, presented a beautiful appearance, and quickly disclosed the approach of one after another of the attacking boats, long before they had come near enough to effect an attack. Simultaneously with this operation of the search lights, the gunners at their batteries, the trained men who handle the Gatling machine guns, and the sharpshooters, all indicated, by the prearranged signals, their readiness to engage the enemy whose approach the search lights had discovered. None of the numerous attacking boats came near enough to reach the outer hawser, or to receive hot water from the hose extended for and aft, and the defense of the Atlanta against this carefully arranged supposititious attack was unanimously pronounced by the judges to be perfect. How the affair might have turned out had the attack been made by real torpedo boats, which can make nearly half a mile a minute, is perhaps quite a different matter, but great credit is certainly due to Admiral Luce and the officers associated with him, for the lesson afforded by such a trial cannot fail to be of substantial value to the service.

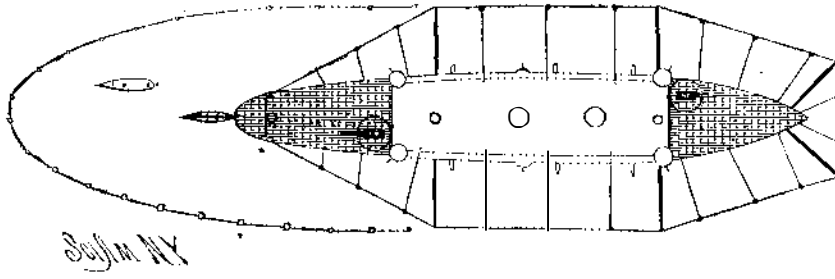
THE art of paper making has reached a point where a tree may be cut down, made into paper, and turned out as a newspaper, in thirty-six hours.

\* SCIENTIFIC AMERICAN SUPPLEMENT, No. 502, contains illustrations of British naval evolutions, including a night attack and system of defense against torpedo boat assaults.

### A Sham Battle of Sailors and Marines near Newport.

In the further carrying out of the plans of Admiral Luce, of the North Atlantic Squadron, and the officers connected with him, to promote efficiency in drill and the use of modern machine guns and improved appliances, a mimic battle was arranged and carried out, on Coaster's Harbor Island, near Newport, on October 13. The scene of the battle was where the British troops were stationed for nearly two years during the Revolutionary war, and a defense and attack were organized, after a regular plan, with as much care and thought as would have been the case if a real battle had been imminent. All the peculiarities of the harbor were studied in arranging to have the attacking parties supported as well as possible by the ships of the squadron, while the garrison defending the post took advantage of a naturally good defensible position to make a creditable defense, until they were outflanked and compelled to retreat. The attack was made about half past twelve at night, on a signal from the flagship, when a flotilla of boats carrying about six hundred men made a landing on the north end of the island, under a supposed fire from a battery on a distant hill. As the boats touched, the men jumped into the water and hastened forward to throw out skirmishers, the pioneers cutting embrasures through the banks for the Gatling guns.

The enemy defending the island, composed of 250 blue jackets, occupied an irregular line of heights running across the island, forming a strong defensive position. There was a prolonged and spirited engagement, in which the different lines of attack and defense, on the right, left, and center, were successively the object of most particular interest, each side using their machine guns and small field pieces with great effect; and various features of the position, such as an



PROTECTING CABLES EXTENDED AROUND THE ATLANTA.

old quarry, orchard walls, bluffs, and gulleys, were taken advantage of to aid first one side and then the other. The attack was a success, the whole affair being decided upon according to stipulations and plans previously agreed to by the umpires, and the battle afforded an excellent study of the practical work of war on a historic spot. This is only a portion of the work of the war college established by Admiral Luce at Newport, which has already been of great advantage to both the officers and men of the navy.

#### Charles L. Tiffany.

The fiftieth anniversary of the establishment of the jewelry house of Tiffany & Co., of New York, was celebrated in a very pleasant way by the employes and directors of the company of which Mr. Tiffany is the head. Wednesday morning, September 21, when Mr. Tiffany drove up to his establishment, he inquired why the big flag was floating from the building, having forgotten the fact that it was the anniversary of the beginning of his business. When he opened the desk in his office, there was revealed a beautiful rosewood box, two feet long by seven inches wide, on the lid of which was a tablet of pure gold, with "Chas. L. Tiffany, 1837-1887," engraved upon it. A key of gold rested in the Bramah lock, and when Mr. Tiffany opened the casket, he found on a bed of ruby velvet a vellum manuscript rolled on a magnificent ivory scroll. On the parchment was the following address of congratulation, each letter of which was beautifully illuminated in gold and colors:

"UNION SQUARE, NEW YORK, Sept. 21, 1887.

"MR. CHARLES L. TIFFANY:

"Dear Sir: On this, the fiftieth anniversary of the house of Tiffany & Co., we offer to you our congratulations on your unprecedented success, and that of the business founded by you, which, from an humble beginning, has, through your integrity, sagacity, and energy, arrived at the position of being not alone the first of its kind in America, but also the representative house of its business in the world. To our congratulations we add our hearty good wishes for the continuance of your health and prosperity, and that you may live long to enjoy the fruits of your labors."

This address was followed by the signatures of 1,110 employes of the firm, several of whom have been over forty years in Mr. Tiffany's employ.

Mr. Tiffany is a very quiet, unassuming man, and those who knew him best planned the presentation of this testimonial in such a manner as to spare him the embarrassment of a speech. The elegant and unex-

pected offering, and the way in which it was presented, touched him deeply. Mr. Tiffany has always proved himself a model employer, and is heartily liked by his subordinates. He has always attended personally to the business of the firm, and still continues to do so, being perfectly hale and hearty, although he is well on in the seventies.

Thousands of Mr. Tiffany's customers throughout the country will join the *Journal* in wishing him many happy, prosperous years in which to continue at the head of the great business which he has built up.—*Jewelers' Journal*.

#### Liquid Fuel.

About eighteen months since, we noticed the liquid fuel system of Mr. Edwin Henwood, of 22 Great St. Helen's, London, as applied to a screw steamer, the *Ryde*, of 120 tons burden. Mr. Henwood has now fitted a steam launch, the *Ruby*, with his apparatus, and we recently made a short run in her. The *Ruby* is 38 feet long by 7 feet beam and 3 feet 10 inches deep, and has a direct acting vertical engine, with a seven inch cylinder and an eight inch stroke. The boiler is of the return multitubular type, and the boat is driven by a three bladed delta metal screw propeller, 2 feet 8 inches diameter and 4 feet pitch. The fire bars have been removed, and replaced by Mr. Henwood's fire-brick lining. Petroleum is supplied to a nozzle by gravitation from a tank over the boiler, and is injected into the furnace by means of steam taken from the boiler. The furnace is primarily started with coal until a sufficient steam pressure has been reached in the boiler to start the oil-burning apparatus. Upon the occasion of our run, steam was well maintained, and good speeds obtained. The results of some comparative trials previously made by Mr. Henwood with coal and liquid fuel in this boat show a great economy in favor of the hydrocarbons.—*Iron*.

#### Utilization of Fire Damp.

It is very interesting to see fire damp, the most dreaded enemy of miners, reduced by the genius of man to be his agent and servant, as has been done in Germany recently. The Wurm coal mines, near Aix-la-Chapelle, are particularly noted for the amount of fire damp produced in them, and the minutest precautions had to be taken to prevent dangers that, notwithstanding this, were to be feared. Mr. Hilt, director of the mines, undertook the work. He constructed a line of piping that ran in front of all the centers of work and ended in a main pipe connected at the surface with a powerful suction pump.

But it was not enough to get rid of the noxious gas with money—it was necessary to utilize it; and so Mr. Hilt conceived the ingenious idea of causing the conduit to end in a gasometer. Upon isolating the latter, and placing wire gauzes here and there in the conduit, he was enabled to lead the gas to the furnace of two generators and use it to help heat them.

We are obtaining, says the director, 30,500 cubic feet of fire damp, which distill 263 cubic feet of water. On uniting the fire damp of all our exploitations, we shall have 64 cubic feet per minute, and shall be able to distill 5,260 cubic feet of water per twenty-four hours.

The utilization of fire damp thus stored may become advantageous from a commercial point of view. It may serve not only for gas motors, but also, with well constructed burners, for lighting purposes.—*La Nature*.

#### How to be a "Nobody."

It is easy to be nobody, and the *Watchman* tells how to do it. Go to the drinking saloon to spend your leisure time. You need not drink much now, just a little beer or some other drink. In the meantime, play dominoes, checkers, or something else to kill time, so that you will be sure not to read any useful books. If you read anything, let it be the dime novel of the day. Thus go on keeping your stomach full and your head empty, and yourself playing time-killing games, and in a few years you will be a first-class nobody, unless you should turn out a drunkard or a professional gambler, either of which is worse than nobody. There are any number of young men hanging about saloons just ready to graduate and be nobodies.

DEFINITENESS IN KNOWLEDGE.—The memory will only be content when there is that accuracy which gives absolute confidence. Suspicion of inaccuracy is the most vicious element in memory. It is more satisfactory not to recall a thing than to recall it in such a way as not to know what we have recalled—whether the recollection is reliable, where the memory of fact shades into fancy. It requires the best mental activity, the closest observation, the clearest thought, the sharpest discrimination, the cleanest classification, to give knowledge that definiteness which is indispensable to reliability in memory and accuracy in recollection.—*Journal of Education*.