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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.

LONGER PIERS FOR OCEAN STEAMSHIPS.

On the front page of this issue will be found some illustrations of the latest of the huge transatlantic liners, the "Olympic," which is now under construction at Belfast. Her extreme length from stemhead to taffrail is 890 feet. The length of the new White Star dock at Chelsea is 800 feet. In two or three years' time, when the ship reaches New York on her maiden trip, and has been warped into her berth with her stem a few feet from the inshore bulkhead line, her stern will project into the channel one hundred feet beyond the end of the dock. The risk of these conditions to the ship itself is only equaled by the serious interference which this one hundred feet overlap will present to the up- and down-stream traffic of the river, to say nothing of the increased difficulty of bringing other transatlantic liners to their berths in the adjoining piers. Despite the strenuous efforts of the Dock Department to keep pace with the demands of the transatlantic passenger service, it is evident that the increase in the size of ships has already outstripped the pier accommodation.

Just here it is fitting to compliment the department on the magnificent stretch of piers known as the Chelsea Improvement, which has recently been completed, and is now being occupied by the leading transatlantic companies. Had it not been for the efforts of the department and the steamship companies, aided by the strong indorsement of the Mayor, these docks would never have been built, at least on their present scale of size and equipment. None of them is less than 800 feet in length, and a few are 825 feet. While the plans were under consideration, an earnest effort was made to secure the permission of the War Department to extend the pierhead line farther into the North River. When this was refused, it was decided to secure the necessary length by excavating into the foreshore, and a wide strip of land, extending the full length of the frontage, was purchased at a heavy outlay.

Whenever the further reconstruction of existing docks on the North River comes up for consideration, the question of length will again be agitated; and it is sincerely to be hoped that some way out of the dilemma will be found, by which the future length may be set at not less than 900 feet. So long as the War Department is in its present state of mind, the possibility of securing an extension of the pierhead line one hundred feet farther into the river is very remote. The War Department is the federal guardian of the waterways of the United States. It is its duty to see that no encroachment is made upon harbor or waterway facilities in the interest of private corporations or other local interests.

In its consideration of the encroachment of piers and bulkheads upon the available width of rivers, channels, and other waterways, the War Department has to determine the line of just compromise between the demands of local docking interests and those of the general water-borne commerce, which naturally asks for as wide a stretch of fairway as possible. In view of the fact that the North River at New York has a clear width between pierhead lines of about 3,000 feet, we cannot but feel that where the question of the future development of ocean steamships is at stake, the narrowing of this channel by the extension of the Manhattan pierhead line one hundred feet farther into the river is a matter which should call for favorable consideration on the part of the War Department. It is true that the current in the North

River is at present inconveniently swift; but it is not conceivable that a reduction of the width of the channel by about three per cent would have any material effect in this direction.

If it be found impossible to build piers of the desired length on Manhattan Island, the big ships of the future will be driven to use the new piers which the Dock Department is now building in South Brooklyn, near the Bay Ridge Channel, of which there are six, ranging in length from about 1,200 feet to 1,832 feet. Objections have been urged against the use of these docks by passenger steamships of the larger size, on the ground that the approaches would present certain difficulties of navigation. The more serious objection, however, would be that of the traveling public, who would find the long journey from Manhattan, and especially from the northerly portion of Manhattan, a serious inconvenience. In reply to this the Dock Department points to the fact that the projected Fourth Avenue Subway will pass within two blocks of the new piers. This, however, would make no provision for the transport of personal baggage. From practically every point of consideration of the traveling public and the steamship companies, the piers for passenger traffic should be located either upon or opposite Manhattan Island. If the decision of the War Department to permit no further extension into the river is unalterable, the city should seriously consider the possibility of securing the necessary length by excavation into the foreshore.

LIGHTER THAN AIR.

We described in our last issue the cruise of the monster dirigible balloon "Zeppelin II," from its home on Lake Constance to Bitterfeld near Leipzig, 465 miles away, quite independently of the direction of the wind, and its return under its own power to Friedrichshafen. The perfection of the voyage was marred only by an accident, which, after temporary repairs had been effected, did not prevent the completion of the tour. Later dispatches report great skill, promptitude, and spirit on the part of Count Zeppelin in making repairs, the efficiency of the latter in enabling the balloon to reach home, congratulatory telegrams from the German Emperor and hosts of other friends on the success of a journey involving all those features, and—six weeks required to restore the balloon to its former condition and repair one minute's damage. We are very far from wishing to depreciate either the indomitable spirit or the technical skill of Count Zeppelin. It is a very great feat so to construct an immense gas bag as to navigate it continuously for 36 hours, traversing 850 miles of atmosphere independently of meteorological conditions. It is hardly less a feat to oppose it to a 45-mile gale and to be carried backward at the rate of only seven miles an hour. We cannot deny that the navigability shown by the "Zeppelin II" demonstrates the advantages of the rigid type as applied to balloons, nor that the advantages of Count Zeppelin's compartment system have been shown by the limitation of damage to one section of the balloon and the rapidity of temporarily making sufficient repairs. We venture to think, however, that the moral of this latest journey is not that the rigid-type dirigible balloon represents the *dernier cri* in the conquest of the air, as all Germany appears to think.

Germany, we are told in private advices, is "Zeppelin mad," in a state of hysteria comparable to the British "Dreadnought" scare, and more often attributable to France or America. The usually stolid Teutons, worthily distinguished for the thoroughness of their scientific investigations, are rushing to subscribe hard-earned savings or unearned increment to airship companies or Zeppelin subsidies, and cannot be tempted with gilt-edged bank stock. All other departments in the world of sport are neglected for aeronautics, and aeronautics from Switzerland to the Baltic mean Zeppelin dirigible balloons.

Let us with the perspective afforded by this distance of time and space, review the subject a little more calmly.

Tests of the "Zeppelin I" made in March established satisfactorily the inventor's claims that the airship could be landed successfully on the ground as well as on water. The balloon responded so admirably and swiftly to the steering apparatus, that the pilot was able to bring it down gently and gradually, even without the customary assistance of a file of soldiers to haul it down by ropes for the last few yards. Moreover, it demonstrated its ability to hold its course and achieve its descent in spite of sudden gusts or squalls.

This had been a point of dispute between the advocates and the opponents of the Zeppelin system, and the former scored heavily on this point, since the motors and rudders were able to resist squalls or flurries of wind, whether the direction of the air currents was horizontal or upward.

On the other hand, the hostile critics declared that if the motors were stopped or disabled, the airship would be at the mercy of squalls. And this contention seems unfortunately borne out by the accident

which occurred under just such circumstances at the close of the brilliant flight of May 29th-31st above referred to.

The journey of the "Zeppelin I" to Munich on April 1st and 2nd was also highly successful from nearly every point of view, except that the rate of speed was not so great as had been hoped for. The most notable observation made was that the machine was able to ascend dynamically about 1,000 feet higher than it could do by the mere buoyancy of the gas. In all these trials the horizontal rudders worked admirably, the consequent power of swift ascent and descent being one of the strong advantages.

In spite of these successes, however, there has been persistent criticism of the Zeppelin system in military circles, and the military experts no longer favor the Zeppelin craft for use in war. It is claimed that the Gross and Parseval dirigibles are equally good for scouting purposes, have made equally successful long-distance flights (this was before the achievement of May 30th) and have the great advantage of being smaller, cheaper, and more easily transported.

Count Zeppelin excuses the accident of May 31st by saying that a shower of rain had prevented his properly reconnoitering the landing place selected for the balloon. This we understand is intended strictly for a war balloon, a duplicate of which was purchased for a large figure by the German government for military purposes. Are we to understand that the wars of the future are to be conducted only in fine weather, or that war balloons must remain indefinitely suspended until suitable landing places can be reconnoitered? This seems to conflict with stories we have heard of night spying or bomb dropping by balloons.

The very triviality of the cause of the accident, the very nearness of the successful completion of a sensational trip, seem to us to emphasize the unreliability of the monster gas bag. The papers report a mass of aluminium stays tangled in the branches of the tree encountered—damage taking six weeks to repair. If this can be caused by a puff of wind the moment the controlling motors are stopped, it only confirms our opinion that the practicable military airship is not the rigid, semi-rigid, or non-rigid dirigible balloon, whatever the uses of any or all of the latter for pleasure excursions in selected weather. "Trifles light as air," the poet speaks of; and without condemning painstaking and praiseworthy experiments as "trifling," we maintain that nothing lighter than air is going to give us the ultimate solution of the problem of mechanical flight, any more than we are limited to materials lighter than water for navigation of the sea.

THE AWARD OF THE FOURTH-DIMENSION PRIZE.

Prof. Henry P. Manning, of Brown University, and Prof. S. A. Mitchell, of Columbia University, the judges whom the SCIENTIFIC AMERICAN selected to pass upon the essays submitted in the Fourth Dimension Contest, have awarded the \$500 prize given by an anonymous friend of the SCIENTIFIC AMERICAN to the essay written by "Essayons," the pen name of Lieut.-Col. Graham Denby Fitch, Corps of Engineers, U. S. A., stationed at Duluth, Minn.

The second best essay was that of "Incredulous Odi," whose real name is Edward H. Cutler, of Linder Terrace, Newton, Mass. The third best essay was written by "Platonides," whose true name is F. C. Ferry, of Williamstown, Mass. The fourth best essay bears the pseudonym "Charles Henry Smith," of Carl A. Richmond, Marquette Building, Chicago, Ill. The essays which were thus accorded second, third, and fourth place are honorably mentioned. The winning essay of Lieut.-Col. Fitch will be published in the SCIENTIFIC AMERICAN of July 3.

Neither the judges nor the Editor knew the real name of the winner until the prize essay had been selected. Each contestant was obliged to write his essay under a pseudonym and to place in a sealed envelope bearing that pseudonym his correct name and address. These envelopes were held in the office of the SCIENTIFIC AMERICAN, and only the essays sent to the judges for examination. When a decision was reached and the prize awarded to "Essayons" the envelope bearing that pseudonym was opened by the Editors and found to contain the name of Lieut.-Col. Fitch. The same procedure was followed in the case of the essays which were deemed worthy of honorable mention.

Considering the character of the subject, the interest shown in the contest has been astonishing. No less than two hundred and forty-five competitive essays were received, not only from American readers of the SCIENTIFIC AMERICAN, but from foreigners as well. The essay wrappers bore the postmarks of Turkey, Austria, India, Australia, France, and Germany. Indeed, almost every civilized country of the world was represented. The contest was therefore thoroughly international, and it is no small gratification to us that an American army officer should have borne off the prize, and that all the contestants who were honorably mentioned should also be Americans.