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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.

THE HIGH-SPEED MOTOR-BOAT MODEL.

The growing popularity of the high-speed motor boat is shown by the fact that an exhibition devoted entirely to small power-driven vessels of high speed has recently been held in this city in which an excellent exhibit was made of some of the latest and fastest of these craft and of the most approved types of engine used for their propulsion. The cause of the extremely high speed that is developed by these boats is twofold. In the first place, it is due to the introduction and refinement of a new principle of modeling developed during the past few years, which is an entire departure in some respects from the accepted speed lines for fast vessels which have governed designers ever since the modeling of high-speed craft was placed upon a scientific basis. The other cause is to be found in the remarkable development of the gas engine, resulting in the production of a given horse power for a minimum amount of dead weight. It is the simultaneous production of a high-speed model and an ideal motor to drive it that is responsible for the widespread interest in this fascinating form of sport.

The credit for the development of what might be called, for want of a more descriptive term, the motor-boat model, is shared equally by the yacht designers of the old and the new world; and we say this without any disparagement of the work done by the torpedo-boat builders, such as Thornycroft and Yarrow in England, Normand in France, and Schichau in Germany. Mention should be made of the speedy craft built by Herreshoff and Mosher in this country, and the work done by Kretschmer, naval constructor of the German navy. It is difficult to say just who was the originator of the type, and it is probable that it was an evolution that was the outcome of continued experiment and trial. Kretschmer, working on independent lines in Germany, seems to have clear title to originality in his own country, where he was enabled to patent his "tetrahedral construction;" but we understand that his application in this country was denied on the ground that the same principle has been in use for some years in the Mosher boats. In this connection we may mention that in the current issue of the SUPPLEMENT we publish the plans of one or two fast German launches of this design, together with a description of the principles upon which their lines were drawn.

The main object aimed at in the lines of this craft is to keep down wave-making, which at high speed is the chief cause of resistance. The water lines are practically straight from the bow almost to the stern, and the bow angle at the water line is twice as sharp as that of a boat of equal length and beam modeled on the old speed-line theories. Straight water lines are secured by placing the point of greatest beam at the extreme or almost extreme stern of the vessel, an arrangement which causes the immersed sections to vary from a sharp, deep V at the bow to a broad, shallow U at the stern. The sharp angles of the water line and the gradual change from V to U sections may be regarded as the cause of the inappreciable wave formation, since the currents of displaced water are not subjected to a constant change in direction as in ordinary boats; and when these craft are driven at full speed, only a slight bow-wave is formed and a relatively small stern-wave, while no hollowing of the water at the sides of the boat is perceptible. Another advantage is that in spite of the great sharpness of the lines, the boat has a greater beam than one of equal fineness of line built upon the ordinary model, with a corresponding gain in stability. At the same time, these vessels are extremely sensitive to any disarrangement of their trim, and if the proper trim be not preserved, there is a marked diminution of the speed.

Whether principles that have been so successful in small boats are capable of application to large ocean-going ships is, we think, open to question. This very

matter of trimming would, at the outset, present considerable difficulties of a commercial and operative quality. Mr. Kretschmer, however, has been engaged in designing upon his "tetrahedral" principles an ocean-going vessel of the size of "Kaiser Wilhelm II.," and on a length of 690 feet, a beam of 78½ feet and a maximum draft forward of 24½ feet, diminishing toward the stern, he produces a ship which, with an indicated horse power of 20,000, he expects to realize a speed of 24 knots. In this connection it is interesting to note that towing tank experiments carried out by the Russian navy department at St. Petersburg have demonstrated the merits of this form for the attainment of high speed. For low speeds of 12 knots and under, no perceptible advantage is noticeable between the tetrahedral and the ordinary model; from 12 to 14 and even up to 16 knots, the towing tests showed that the tetrahedral form is at a disadvantage, since by reason of the greater amount of frictional surface presented, greater power is required for a given speed than with a ship constructed in accordance with the usual principles; but for speeds above those mentioned, where wave-making is set up, the new design gains in speed at a multiplying rate.

RAISING CARRIER PIGEONS.

The popularity of the homing, or carrier, pigeon has been greatly enhanced in the last few years by the annual races held in different parts of the country. At the present time fanciers are arranging for a race during the coming summer, which will eclipse anything heretofore attempted. The race will be for 500 miles, from Spartanburg, N. C., to Philadelphia, and over 2,000 birds are expected to enter the contest. It will be held on the Fourth of July, and in all probability most of the pigeons will cover the distance in ten hours. The present record for the flight is 1,603 yards in a minute, which in a 500-mile race should enable birds of ordinary speed to finish within ten or twelve hours.

The event will be one of a series of contests which have been held in the past ten years; but it will be the first 500-mile one in which anything like so many birds have started. In the 200-mile race of several years ago from Orangeburg, Va., 1,500 birds were liberated. In 1896 a smaller number of birds were started in the race. In this race two birds flew 614 miles in one day, and several have covered 600 miles in a day with apparent ease. The pigeons are carried to the starting place in baskets arranged especially for them, and liberated directly from the baskets if the day is favorable for an immediate start. Pigeon sheds are made to accommodate the birds for a prolonged stay in the event of unfavorable weather. The birds are shipped to the scene of the race by special cars under the direct care of the Pigeon-Flyers' Protective Association. Hundreds of birds have been lost in the past races through theft, and many owners of fine homing-pigeons have consequently been reluctant to enter their birds in the contests for fear of losing them. In the present race a uniform style of lock for the baskets will be adopted, and only the caretakers will be provided with keys. If the locks are opened or picked, and pigeons stolen, the association will investigate and prosecute the offenders.

There is no more delightful sport than pigeon racing of this character, nor any more enthusiastic sportsmen than the breeders of the homing pigeons. Clubs devoted to raising and improving the carriers are scattered in every State in the Union, and their memberships are all large; but there are tens of thousands of individual breeders who do not belong to any association. Thousands of these breeders enter their home-raised pigeons in the races and sometimes win prizes which the professionals fail to capture.

The best carrier pigeons are worth several hundred dollars in the market, and some cannot be purchased at any price. During the annual pigeon show at Madison Square Garden last year, \$200 and even \$300 were refused by the owners for some of their choicest pets. The average exhibited were valued at \$25 and \$50. Prices, however, do not stand in the way of the pigeon fancier to-day, for excellent homing pigeons can be purchased for \$5 and less. One can start a loft with half a dozen breeders, and within a few seasons have all the birds desired. The loft is a simple affair where only a few birds are raised. The breeding quarters are separated from the living quarters, and a place large enough for the birds to stretch their wings is provided. The wonderful instinct of the homers is made apparent at an early age; but it is something that is partly due to training and development. A carrier pigeon that has never been released from its loft until full grown cannot find its way back over a long route. The process of training is necessary when the pigeons take their first flight.

"Home," to the carrier pigeon, is where it was born. There is no other home, although they have been trained to adopt a second home in some instances. When born in the loft, it is an easy matter for the breeder to teach the pigeon to return to it. The pro-

cess of training consists simply in releasing the bird when first able to fly a short distance from the loft. The pigeon will jump into the air, and after a few circles, fly straight to the loft. In the second flight the distance is increased, and so on until the bird's education is complete. This education must be conducted by the breeder with gentleness and due consideration for the bird's feeling. If the distance for the first flight is too great for the pigeon, it will get confused, and it is liable to prove less accurate in its future flights. Each progressive step must be made for the purpose of establishing the bird's sense of distance and direction, and not to see how far it can be removed from the loft without losing the way in returning. A lost homing-pigeon is never quite the same, even after being rescued and taken home. After the bird gains full maturity and its education has been completed by the process described, it seems capable of finding its way home from almost anywhere. Birds released in Jacksonville have flown a thousand miles north to their homes without being lost.

When released, a homing-pigeon does not fly continuously unless the distance is short enough to enable it to reach home without stopping for rest. If the distance can be covered in ten or twelve hours, the pigeons apparently take little rest, but fly almost continuously until they reach their loft. In the few 1,000-mile races conducted years ago on the Atlantic sea coast from Florida to New York and Philadelphia, a number of the birds were lost, while others stopped on the way several times to rest; but the choicest birds which finished the long course were apparently on the wing most of the time, stopping possibly a few hours on the way to get food and rest. These long flights are not encouraged to any great extent any more, for the birds are not only frequently lost, but they cannot always get proper food along the route to sustain their powers. The birds have been weakened, and the effect on their health proved permanent. The 500-mile race is the favorite for long-distance birds, and 200 and 300-mile courses for the younger birds that have not yet won their laurels.

Besides being bred as pets and desirable companions, the homing-pigeons are now being used for various services. It looks very much as if their services as war messengers would soon be dispensed with, for wireless telegraphy has made the pigeons superfluous, and the extensive pigeon lofts in the military and naval services of European nations will probably soon become useless.

In peaceful pursuits, however, the homing-pigeons have in recent years become of great service. Country physicians have in many instances adopted them as messengers. A physician raises a loft of carriers for the pleasure of it, and when he visits a patient four or five miles away, he carries with him a basket containing one of his birds. If dangerous symptoms arise in the night or the following day, the pigeon is released with a message. Some physicians with long country routes carry a half a dozen or more of these pigeons on their rounds, and leave one at each place. A daily report of the different cases can thus be obtained by pigeon service at no cost to physician or patient. This service has also been extended on the large Western farms. Some farmers receive daily reports of the markets from the city in this way. There are no telephone or telegraph wires to send the messages; but the pigeons answer the purpose satisfactorily. All that is required is a trip to the city once a fortnight to carry back the birds, and some one in the city to write the reports and release the birds.

ON THE WORKING OF COMBINED COHERERS.

In a paper recently read before the French Academy of Sciences, M. A. Turpain examines the behavior of a set of several coherers connected to the same antenna. The sensitiveness of a coherer is determined by means of the distance over which a radiator is just capable of acting distinctly on the coherer. The distinctness of this action is given by the value of the current, which, after cohesion has been established, will traverse a very sensitive galvanometer. If the coherer be inserted in a closed circuit, its sensitiveness is found to be much higher than when in open circuit; in fact, at the moment of the emission of waves, one electrode only of the coherer is connected to the antenna and to one pole of the cell, the current of which is intended to traverse it, while the other electrode of the coherer is insulated. This is started by connecting the insulated electrode of the coherer to the ground and to the second pole of the battery after the waves have been emitted. If several coherers be connected in shunt, one of the electrodes of each coherer being connected to the common antenna, while the other is or is not connected to the remainder of the circuit, the following facts are stated: 1. The coherers will preserve the same relative sensitiveness, both in open and in closed circuits. 2. In order to ascertain the sensitiveness of several associated coherers, an emission of waves such that one coherer only is acted on, should be produced, all the