them carefully on an analytical balance and obtained the following figures:

Weight of ant..... 3.2 mg.
Weight of grasshopper..... 190.0 mg.

Thus, the ant was dragging a load that weighed approximately sixty times his own weight. This is equivalent to a man whose weight is 150 lbs. *dragging* a load of 4½ tons, or a horse of 1,200 lbs., a load of 36 tons! Is this not somewhat remarkable?

ARMAND R. MILLER.

NAVAL ENGINEERING.

THE most extraordinary achievement in the domain of fast yacht or torpedo-boat construction has lately been reported as the outcome of Mr. Chas. D. Mosher's work in designing the high-speed steam-yacht, *Arrow,* for Mr. Chas. R. Flint, of New York. On the 7th of September this craft made a speed of *above 45 miles an hour* on the Hudson River, making the mile in less than one minute and twenty seconds. The measured mile was established by the Coast Survey, which sent its steamer *Bache* to fix its location some time since. This performance exceeds by three miles, nearly, that of the British torpedo-boat destroyer *Viper,* with engines of the Parsons type of steam-turbine. The latter made 42.25 miles an hour, a mile in one minute and twenty-five seconds. The *Arrow* is but 130 feet over all, 12 feet 6 inches beam, displacing 66 tons, on a draft of 4 feet 7 inches. The water-tube boilers contain 5,540 square feet of heating surface and the quadruple-expansion engines are capable of producing 4,000 horse-power. Maximum steam-pressure is reported to be 400 pounds at the boilers and 390 at the engines. The following table presents the records of recent fast craft of this type:

Boat.	Type.	Mile.	Knot.	Miles per Hour.	Knots per Hour.
Arrow	Yacht	1:19 9–10	1:32	45.06	39.13
Viper	English Torpedo Destroyer	1:25	1:38	42.25	36.50
Turbinia	Yacht	1:28	1:44	40.00	34.50
Takou	French Torpedo Destroyer	1:32	1:52	37.50	32.00
Taku	German Torpedo Destroyer	1:32	1:52	37.50	32.00
Ellide	Yacht	1:34	1:55	36.50	31.00
Bailey	U. S. Torpedo Destroyer	1:40	2:00	35.00	30.00
Murakumo	Japanese Torpedo Destroyer	1:40	2:00	35.00	30.00

CONSUL J. E. KEHL sends to the Department of State, from Stettin, a description of the new North German Lloyd steamship *Kaiser Wilhelm II.,* recently launched at the Vulcan yards in that city. The cost was 16,000,000 marks, and she is scheduled to sail during the early part of April, 1903, between Bremen and New York. He says: The *Kaiser Wilhelm II.* is built according to the German Lloyd requirements for the highest register of the four-deck ship class. Her double bottom is divided into 26 water-tight compartments, while the hull proper is divided by 17 bulkheads into 19 water-tight compartments, each compartment having separate outlets to the promenade decks. Her 17 pumps are said to be capable of discharging 9,360 tons of water per hour. The construction of the stern is very similar to that of *Kaiser Wilhelm der Grosse,* excepting that the plating below the water line, inclosing the screw shafts, and above the rudder is cigar-shaped, leaving a large arched space on each side between the center line and screw shafts, running forward and gradually tapering for a distance of about 25 feet into the common hull shape. This has been done in accordance with the requirements of the German Admiralty, at whose disposal the ship will be placed in the event of war.

There are 4 sets of 4-cylinder expansion vertical engines, with surface condensers, each set working on 3 cranks, 2 sets for each propeller shaft. The engines are balanced after Mr. Schlick's patent and will indicate altogether 38,000 to 40,000 horse-power. They are set up in pairs, one behind the other, so as to bring a water-tight bulkhead between each pair, thereby increasing the safety of the vessel. The steam will be produced by 12 double-end and 7 single-end boilers, which will

Name of Ship.	Date.	Length over all	Beam.	Depth.	Draft.	Displacement.	Speed.
		Feet.	*Feet.*	*Feet.*	*Feet.*	*Tons.*	*Knots.*
Great Eastern	1858	692	83	57½	25½	27,000	14.5
Paris	1888	560	63	42	26½	15,000	20.5
Lucania	1893	620	65	43	28	19,000	22.1
Kaiser Wilhelm der Grosse	1897	649	66	43	29	20.000	23
Oceanic	1899	704	68	49	32½	28,500	20.7
Deutschland	1900	684	67	44	30	23,200	23.5
Kronprinz Wilhelm	1901	663	64	43	30	21,280	23.53
Celtic	1901	700	75	49	36½	37,700	16
Kaiser Wilhelm II	1902	706½	72	52½	.....	26,000	*23

work at 225 pounds per square-inch pressure. The ship's accommodations are for 775 first-cabin passengers, 343 second-class passengers, and 770 steerage passengers. It may be interesting in this connection to give dimensions of existing leviathans, to afford comparison with the *Kaiser Wilhelm II.;* also to note the size of the famous *Great Eastern,* now broken up.

SCIENTIFIC NOTES AND NEWS.

SIR NORMAN LOCKYER has been elected president of the British Association for 1894, when the meeting will be held at Cambridge. The meeting next year, as already announced, will be held at Southport.

PROFESSOR W. H. WELCH, of the Johns Hopkins University, sailed last week for England where he delivers the Huxley lecture before the Charing Cross Hospital on October first.

LIEUTENANT ROBERT E. PEARY, on the *Windward,* arrived at Nova Scotia on September 18, and Captain O. N. Sverdrup, on the *Fram,* arrived in Norway on September 19. Both expeditions doubtless accomplished valuable work for geography, natural history and ethnology, the results of which will be subsequently published. The *Fram* had a corps of scientific observers, consisting of Naval Lieut. Victor Baumann (astronomer), Lieut. G. Y. Ysachsen (cartographer), Dr. Svendsen (meteorologist), Dr. Bay (zoologist), Dr. Herman G. Simmons (botanist), and Dr. P. Schel (geologist).

* Contract calls for no less than 23 knots, like the *Kronprinz* and *Deutschland,* which do almost 1 knot better than their contract. It is confidently expected that the *Kaiser Wilhelm II* will break all records by going 24 knots and possibly more.

PROFESSOR ANGELO HEILPRIN has returned to Philadelphia from Martinique, having been on Mount Pelee on the afternoon of the recent eruption. This occurred at 9:10 in the evening, and the area of destruction was much greater than in the eruption of May 8.

PROFESSOR ARTHUR MICHAEL, who has been making a tour of the world during the past year, will resume the duties of the chair of chemistry at Tufts College at the opening of the college year.

DR. JACQUES LOEB, professor of physiology at the University of Chicago, is at present in San Francisco. It is said that he is still considering the call he recently received to the University of California.

PROFESSOR F. HABER, of the Institute of Technology, Karlsruhe, and Professor R. S. Hutton, of Owens College, Manchester, are visiting this country to study the electrochemical industries.

THE German commissioner, Captain Hermann, has reached Europe, bringing with him a large amount of new material for the mapping of the Kivu region.

FOR the study of the density of the earth, President F. W. McNair, of the Michigan College of Mines, and Dr. John F. Hayford, chief of the computing department of the United States Coast and Geodetic Survey, are conducting experiments at the Tamarack mine, near Calumet.

PROFESSOR THEODORE BOVERI, of Würzburg, has received the Stiebel prize of the Sencken-