strongly stated that the plant remains at St. John are numerous and are in a marsh and lagoon deposit. The ecological conditions were different, and so are the plants. The Baie Chaleur beds hold very few species for comparison, and it is not surprising that most are different.

There is no 'isolated Carboniferous molluscan fauna' in the St. John plant beds, and to them therefore Mr. White's argument from this fauna does not apply.

As regards the *Megalopteris* argument, it has to my mind as much force now as before Mr. White's statement in this article that the genus is known to be only as old as the Pottsville. Professor Andrews shows it to have been only twenty or thirty feet above the lower Carboniferous limestone; and it did not spring, like Minerva, ready armed and helmed from the brain of Jove, *i. e.*, it had closely related ancestors of earlier date. And that author described several species, none of which is identical with Hartt's species of the St. John beds.

But, after all, paleontology must bow to stratigraphy, and until it can be shown that the geological structure at St. John has been wholly misunderstood and misinterpreted, this supposed anomaly of plants, generally considered as Carboniferous, occurring in beds as old at least as the Devonian Age, must remain.

G. F. Matthew.

St. John, N. B.,
September 11, 1902.

EVIDENCE OF RECENT ELEVATION OF THE GULF COAST ALONG THE WESTWARD EXTENSION OF FLORIDA.

To the Editor of Science: During the spring of the present year, while doing field work along the Gulf shore south of Tallahassee, Fla., I obtained some facts which seem to show perceptible elevation of the coast in that vicinity within the memory of man. The data upon which the following remarks are based were furnished by Mr. J. L. Oliver, of Wakulla, Florida.

At St. Marks, Wakulla Co., Fla., is an old store or warehouse formerly occupied by a Mr. Harrell. This old house is built on piles, and in the 'fifties' there was an old field with a little pond in it just north of the house. During the 'fifties,' except at neap tide, the water at high tide passed under this house and into the pond. Since that time the pond has been drained, so that now rain water never stands in it, and its present connection with the tides is less obstructed than in the 'fifties,' but, notwithstanding this, the water at spring tide no longer comes under the house or reaches the old site of the pond unless a strong southeast or south wind has been blowing for two or more days.

A neap tide overflows the banks of the St. Marks River only in low places, and an average tide will lack three hundred yards of reaching where the pond was. Brush is taking portions of the marsh, where it had never been known to grow before.

Mr. Oliver's estimate is that the land has been elevated from one foot to eighteen inches since the 'fifties.' At first I thought that filling in with sediment might cause the change of level, but that does not seem probable. Therefore, if this evidence is trustworthy, the Gulf coast in the vicinity of St. Marks, Fla., is rising at the rate of two to three feet per century.

These notes seem interesting, and it is hoped that they may incite others to make observations, or even lead to some attempts by establishing bench marks to measure the rate of change of level.

T. Wayland Vaughan.

Smithsonian Institution,
Washington, D. C.,
September 11, 1902.

THE STRENGTH OF ANTS.

To the Editor of Science: While walking on the university campus the other day, my attention was arrested by what appeared to be a grasshopper moving along the sidewalk without using his hind legs. Upon closer examination, I saw that the grasshopper was dead and was being dragged along by a small ant.

The difference between the size of the little laborer and his load was so extraordinary that I thought it might be of interest to know the exact weight of each. I accordingly weighed

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