

Correspondence.

Roller Boats Again.

To the Editor of the SCIENTIFIC AMERICAN :

I have just seen a reference to the Knapp boat in your current issue which is very unfair. You say that the Knapp boat rolled 41 miles in five days.

The boat, having over one hundred tons displacement, was rolled over 50 miles down the lake with 5 horse power in 10 hours' actual steaming. Now, you know that it would be impossible to drive a boat of the present type of equal capacity at the same rate of speed with anything like that power. Then, again, the Knapp boat is not by any means at rest, but is now being remodeled to carry out Mr. Knapp's own design, which was departed from against his wish by the engineers responsible for the building of this boat. A demonstration will be made of the complete success of this type in the course of another two or three months.

SCOTT HUTCHINSON, B.Sc.

McGill University, January 8, 1900.

An Interesting Case of the Use of Insects as Food.

In a paper read before the Biological Society of Washington, and published in *Science*, New Series, Vol. IX., No. 216, pages 233-247, February 17, 1899, and reprinted in the SCIENTIFIC AMERICAN SUPPLEMENT, Nos. 1209 and 1210, March 4 and 11, 1899, entitled "The Economic Status of Insects as a Class," the writer referred briefly to the use of insects as food, showing that they have formed articles of diet for certain savage peoples since the beginning of the human race. He called attention to the fact that Hope, in 1842, catalogued forty-six species of insects used as food, and that Wallace, in 1854, showed that insects of six different orders were used as food by the Indians of the Amazon. He called attention to the little book entitled "Why Not Eat Insects?" which, although published with an ostensibly serious intent, was, it must be feared, more or less a hoax.

Prof. Riley's experiments with the edibility of the Western grasshopper and of the so-called seventeen-year locust must not be forgotten in this connection, nor yet the experiments frequently made by school-boys in the preparation of a fair article of lemonade by crushing the bodies of ants, diluting with water, and sweetening with sugar.

An interesting note, long overlooked, has just come to the writer's attention through a brief reference in *The Agricultural Gazette*, of New South Wales, for December, 1899. There is, in Australia, a cutworm which frequently does much damage to wheat crops, and the adult moth of which is known popularly as the "Bugong" moth, from the fact of its occurrence in great numbers in the Bugong Mountains. The natives of the Tumut district used to send to these mountains and collect the moths in thousands among the openings in the granite rocks.

In January and March of 1865, Mr. Robert Vyner visited the Bugong Mountains, accompanied by a "black fellow" known to the whites as "Old Wellington." The tops of the Bugong Mountains are composed of granite, and present a series of lofty peaks. Up one of these, a peak called by the natives "Numoi-ahongo," Mr. Vyner and his companion climbed, the path being so steep and rugged that even wild cattle never attempted it. The moths were found in great masses, sheltered between the rocks in deep fissures. On both sides of the chasms the face of the stone was literally covered with the insects, packed closely side by side and overlapping. Six bushels of living specimens could easily have been gathered, and so abundant were the remains of former moths that a stick was thrust into the debris to a depth of four feet. Old Wellington cooked about a quart of the moths for Mr. Vyner, who found them exceedingly nice and sweet, with a flavor of walnut. The "black fellows" collect the moths, according to Mr. Vyner, by spreading a blanket or sheet of bark beneath them. The moths, on being disturbed with a stick, fall down, and are gathered up before they have time to crawl or fly away, and are thrust into a bag. Then a hole is made in the sand and a fire made in it until the sand is thoroughly heated, when the coals are removed for fear of scorching the bodies of the insects (as, in such a case, a violent storm would arise, according to a superstition of the natives). The moths are now poured out of the bag, stirred about in the hot ashes for a short time, and placed upon a sheet of bark until cold. They are then sifted in a net to get rid of the heads, the wings and legs having previously been singed off. They are generally eaten in this condition, but sometimes they are ground into a paste and made into cakes. The species is said by Mr. W. W. Froggatt, the Government Entomologist of New South Wales, to be *Agrotis infusa* Boisduval, and the account of Mr. Vyner's observations is published in a paper by A. W. Scott, M.A., in the rare *Transactions of the Entomological Society of New South Wales*, Vol. II., for 1867-73.

L. O. HOWARD.

United States Department of Agriculture.

Science Notes.

We are in receipt of a publication devoted to the phonograph and projecting pictures, entitled *Bulletin phonographique et cinematographique*, which is published in Paris. It is a paper of considerable size.

Dr. Schenck has been dismissed from his professional positions by request of the Vienna medical faculty for the "frivolous publication of scientific matter." Of course this referred to Dr. Schenck's alleged discovery of a method of predetermining the sex of offspring.

In 1899, 107,415 cabin and 303,762 steerage passengers landed at the port of New York. The North German Lloyd brought 19,769 cabin passengers and 53,646 steerage passengers in twenty-nine trips, while the Cunard line brought 19,045 cabin passengers and 20,853 steerage passengers in sixty-two trips.

The olive crop of France, Italy and Spain is practically a failure. As compared with an average crop, it will hardly reach 30 per cent, in the opinion of well-informed judges. The Italian olives are the greatest sufferers from the pest to which existing conditions are due, southern France being also affected, and Spain in some localities. The damage is wrought by a fly which deposits its eggs in the green fruit.

The Italian government has recently become very strict in issuing passes for museums, etc., to students. Formerly it was not very difficult for foreigners to obtain free passes for the institutions which they were going to visit a great deal, if they were artists or students, but now they must present certificates from the director of some government art institution or some document which will show that they are entitled to the courtesy. As the admission fees are not large, rules of this kind should not be objected to.

Five hundred thousand young trees from 3 to 20 feet tall were chopped down to supply the Christmas trade of New York. These trees come from the Adirondacks, Maine, New Jersey and Connecticut. The amount of plants and flowers sold in New York is estimated to be in the millions, including half a million violets, 200,000 roses, 200,000 carnations, 100,000 lilies of the valley, 500,000 miscellaneous plants, 100,000 bunches of ferns, 4,000 cases of holly, 500 cases of mistletoe, 200 cases of princess pine, 500,000 yards of garlands and 750,000 wreaths.

At the Moscova, on the retreat from Moscow, the French lost 30,000 men; at the battle of Leipzig in 1813, the French losses were 65,000 in three days. At Austerlitz the French lost 28,850 men; at Plevna, 18,000 to 20,000 Russians were killed and wounded. At Gravelotte, the German loss was over 20,000, and the French loss 19,000. The aggregate of the losses at the battle of Stone River in the American civil war was 13,249 on the Federal side, and 10,266 on the Confederate side; at Gettysburg, a large number were killed and 14,497 wounded on the Federal side, while the Confederates lost 2,592 dead and 12,760 wounded. From this it will be seen that the casualties of the British army in South Africa are not excessive.

A radiometer for measuring the heat radiation of the stars has been tested at the Yerkes Observatory. The instrument is the outcome of the work of Mr. E. F. Nichols, of Dartmouth College. It consisted of a suspension system formed of two mica disks, each 2 mm. diameter, blackened on the face, and supported by a light cross arm on either side of a thin glass staff, hung by an exceedingly fine quartz fiber in a partial vacuum. Both vanes were exposed to the radiation of the sky at the focus of a silvered glass mirror of 24 inches aperture, fed with light by a siderostat outside. The rays entered the radiometer through a small window made of fluorite. With the apparatus so arranged, a deflection of 0.1 mm. would be given by a candle fifteen miles distant, neglecting loss by reflection and atmospheric absorption. The results obtained showed that stellar heat radiation was distinctly detectable.

We have received Part II. of the 19th Annual Report of the United States Geological Survey. It contains five papers, "Physiography of the Chattanooga District, in Tennessee, Georgia, and Alabama," by C. W. Hayes, which sets forth the results of a study of a region in which several distinct types of land surface are characteristically developed under such conditions that the part taken by the several factors can be fairly well determined. The second paper, "Principles and Conditions of the Movements of Ground Waters," by F. H. King, contends that the water which occupies the interior of the earth's crust is like that of the ocean and atmosphere, constantly in motion. These motions are at once numerous and extended and very complex, and are brought together and discussed under three categories: gravitational, thermal and capillary. The third paper, "Theoretical Investigation of the Motion of Ground Waters," by C. S. Slichter, relates to investigations of general problem of the flow of water through porous soils or rocks. The fourth paper is entitled "Geology of the Richmond Basin, Virginia," by N. S. Shaler and J. B. Woodworth. The final paper is "The Cretaceous Formation of the Black Hills as Indicated by the Fossil Plants," by L. F. Ward with the aid of collaborators.

Electrical Notes.

In the experiments which have been carried on in South Africa with the Marconi system in wireless telegraphy it was found that cannonading had no effect on the system.

Twenty sets of the Marconi apparatus will be installed on our warships. The first charge for each set will be \$500, and an annual rental of \$500 per set will be paid to the company.

An international street railway congress will be held at the Paris Exposition in September, 1900. The International Street Railway Association has selected Paris as its meeting place in 1900.

Signals have been sent by wireless telegraph through a suite of seven rooms, the doors of which were closed. They were transmitted through a telegraph switchboard containing both dead and live wires.

The use of electrical equipment at many army posts has resulted in the creation of a new grade of Electrician Sergeant to meet the demand of the service, and a school for their instruction is in existence at Fort Monroe, Va.

A submarine cable from Cape Town has been laid to St. Helena, and the cable was landed on November 23, 1899. The present tariff is \$1.70 per word, but on the final completion of the line, the rate will be 97 cents to England.

The first Chinese electric railway has been opened, and connects the Pekin Railway station and the south gate of the capital. The Chinese have not any very serious objections to electricity, as it does not profane the air as does the locomotive, which irritates the spirits of the water and air.

A burglar has been caught in London, and according to the English Electrical Engineer, among his implements of trade was found a portable electric light set. It was undoubtedly intended to be used in his business, as it could be easily switched on and off, and there would be an entire absence of odor.

In the laundry of an insane asylum at Pontiac, Mich., electric irons instead of gas irons have proved to be peculiarly adapted for insane asylum service, where most of the work is done by the patients. There is no chance of their setting anything on fire with the irons, and as the irons are kept at an even temperature, they do not require the exercise of judgment in changing them.

Lieut.-Commander J. C. Colwell, United States naval attaché in London, witnessed at Yeovil, on January 17, the test of an invention which has been offered to the government for steering torpedoes and submarine craft by means of a wireless electrical device on the lines of the Marconi system. The invention, however, is not in any way connected with Mr. Marconi. Lieut.-Commander Colwell was much pleased with the experiment, which demonstrated that the principles were correct.

The Marconi system will be used in the course of a few weeks on the mail steamers between Dover and Calais, and also on the mail steamers between Folkestone and Boulogne. The vessels when in mid-Channel or half an hour from either French or English shores, will have telegraphic communication with either side. No messages will be accepted from the public, and the system will be used only for the service. One pole erected at Dover will command both fleets, either in crossing the Channel, or in port on the other side of the water.

In the Cincinnati Zoological Garden, electricity is employed for guard duty. A fence of fine wire mesh about eight feet high surrounds an inclosure in which there are a number of fine game birds. It was found that rats, cats, etc., climbed over this so that two copper wires were stretched all around the top of the fence about an inch and a half above it and some distance apart. A switchboard was put on the side of an attendant's house and at dark the watchman turns on the electric current, which is supplied from the electric light wires. The silent watchman accomplishes remarkable results in killing the predatory animals.

A system of electric train lighting in use on the Paris, Lyons, and Mediterranean Railway has a dynamo provided on each carriage, arranged with its axis parallel to the rails, says *The Engineer*. A friction wheel on a prolongation of this axis is pressed against one side of a running wheel. In this way the motion of the wheel is transmitted to the dynamo. Between the dynamo and the axle which drives it a friction clutch is provided, consisting of carbon brake blocks pressing on a bronze disk. The pressure of these carbons on the disk is such that slipping only commences when a current of 28 amperes at about 16 volts is being generated by the dynamo. This corresponds to a speed of about 30 miles per hour. At any higher speed slipping occurs, the idea being that the speed of the dynamo shall not increase, as an increased speed would also correspond to an increased torque. The dynamo is used to charge a battery of accumulators, which supply light to the train when it is stationary or only going at a slow speed.