

**NEW STEAM BOILER.**

We illustrate one of the most recent improvements in steam engineering, the larger engraving representing a stationary boiler, and the smaller one a portable boiler, both made under a patent recently granted to Mr. Guy D. Daly, of Flatbush, N. Y. In devising this boiler the inventor claims to have effected a great saving in first cost, in repairs, in the use of fuel, and to have diminished the danger of explosion. The boiler is certainly very compact, and the water appears to be exposed to the best advantage to the action of the fire. There are two systems of pipes starting from opposite sides of the water reservoir, A, near the bottom. By tracing the course of the first pipe, B, the entire arrangement will be at once understood. It passes from the reservoir, A, outward through the brickwork which supports the reservoir, thence downward to a point just above the fire, where it turns inward and passes from one side to the other of the fire arch, forming the coil, D, and finally terminates in the steam drum, F. The pipes, starting from the opposite side of the drum, are arranged in exactly the same way, but run in the opposite direction, and discharge into the steam drum, F, on the opposite side of the arch. In the pipes that leave the boiler there are check valves, C, and in the upper terminal of each coil there is a check valve, E. These valves insure a complete circulation and facilitate the generation of steam. The drums, F, are connected by pipes, G, with a single pipe, which discharges downwardly into the reservoir, A. The coils, D, being subjected to the intense heat of the fire, rapidly converts the water entering through the check valves, C, into steam, which is discharged through the check valves, E, into the drums, F, whence it finds its way through the pipes, G, to the reservoir, A. Whatever spray or moisture is carried along with the steam remains in the reservoir, while the steam is delivered in a dry state to the engine.

The boiler shown in the smaller engraving is similar in construction to the one already described, the difference being that the brickwork is dispensed with, and a portion of the coils is used to form the side of the fireplace, and the entire series of pipes is covered with a smoke jacket of cast or sheet iron.

The reservoir, which, in the stationary boiler, virtually forms the crown sheet, is so distant from the fire that it cannot become injured by heat, and the pipes which form the coils have such a surplus of strength that it would be almost if not quite impossible to burst them. Even if one should, from any cause, give out, it cannot harm the other portions of the boiler, and it may be very readily replaced.

**ENGINEERING INVENTIONS.**

An improved cut-off, especially adapted to beam engines, has been patented by Mr. Thomas E. L. Collins, of Fall River, Mass. It can be adjusted without stopping the engine or changing the position of the lifter, the latter being provided with a movable lower part pivoted to the fixed upper part.

An improved road ditcher, patented by Mr. Isaac Karsner, of Florida, O., is designed for opening ditches along the sides of roads and in fields, and it is capable of forming ditches on inclined surfaces.

Mr. John Witsil, of Bridgeborough, N. J., has patented an improved car coupling. The principal feature of the invention consists in using the car platform as a draw head.

An improved lubricator for steam cylinders, patented by Messrs. John H. Taylor and Richard W. Miller, of New Haven, Conn., is arranged with a view to supplying a measured quantity of oil to the cylinder at each stroke by a forced injection.

Mr. James W. Brown, of Mayfield, Ky., has invented an improved propeller for vessels, consisting in a series of paddles of peculiar construction, which are thrust backward from the stern of the vessel.

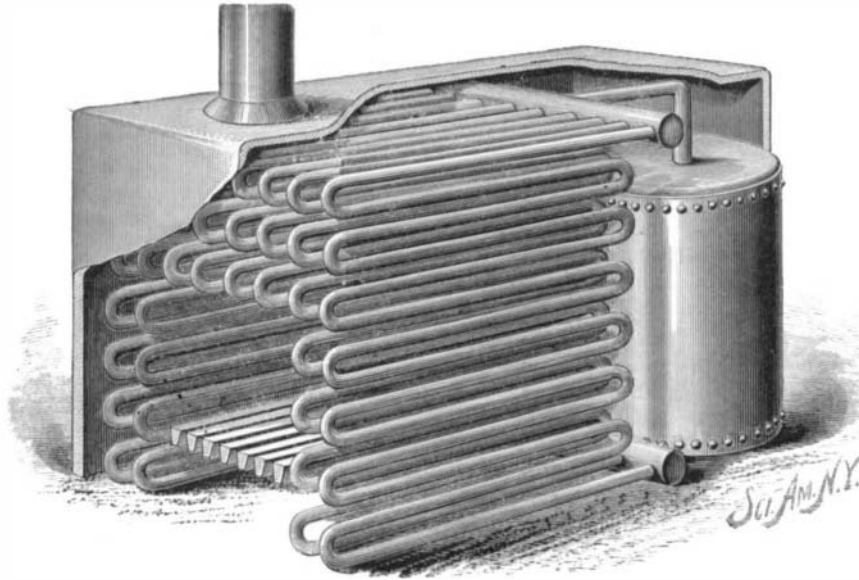
An improved water wheel, to be used in streams where there is little or no head, has been patented by Mr. John Ebersole, of Chambersburg, Pa. It is designed to be run by the current, and is not retarded by still or back water.

Mr. Andrew J. Hopewell, of Edinburgh, Va., has patented an improved turbine water wheel, in which water is admitted through laterally opening chutes or water ways. The chutes are controlled by a corresponding series of gates having a rotary adjustment.

An improved coupling for railway freight cars has been patented by Mr. Washington L. Harvey, of Danville, Va. The cars are coupled automatically, and may be uncoupled by a person standing on the top of the car.

Mr. Daniel Abrey, of Greenville, Mich., has patented an improved rotary engine. The improvement relates principally to a cut-off, and to a novel movement for the abutments.

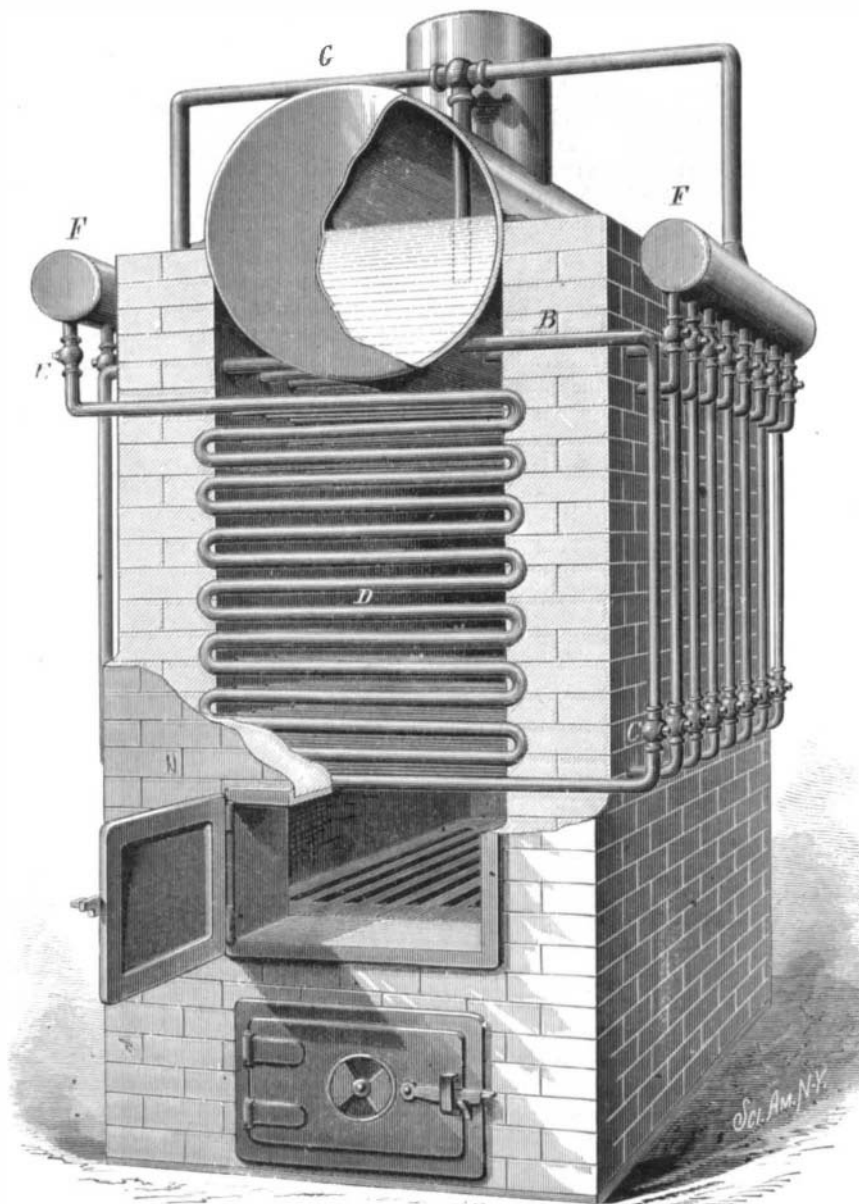
An improved device for attachment to locomotive engines to prevent the smoke, cinders, and dust from the smoke-

**DALY'S PORTABLE BOILER.**

stack from entering the cars, has been patented by Mr. T. B. Taylor, of Mount Meigs, Ala. It consists in an inclined or diagonal plate placed so as to deflect the cinders and smoke from the path of the train.

An improved car coupling, designed to automatically couple cars without the necessity of going between the cars, and which also permits the cars to become automatically disengaged in case of accident, has been patented by Mr. James D. Martin, of Johnson City, Tenn., assignor of one half his right to Mr. James R. Meek, of Carter's Depot, Tenn., to whom communications should be addressed.

An improvement in stock cars has been patented by Mr. Franklin B. Hall, of Palatine Bridge, N. Y. This invention is designed to afford rest and support for cattle during transportation.

**DALY'S IMPROVED STEAM BOILER.****Dangers of Wall Street.**

A New York correspondent to one of our contemporaries thinks there is not a better place in the United States to stay away from than Wall Street in this metropolis, with the exception, perhaps, of Memphis or New Orleans in a yellow fever season. I know five men, says the writer, who went there to try their luck about a year ago. One was a confidential clerk in a foreign house that operated largely in the street. He was in a good position to get "points," and the understanding was that the others should operate upon them, letting him in for a share of the profits in consideration of the information he should furnish. These five formed a little ring with a cash capital of about \$50,000. They hadn't the slightest doubt about doubling it in six months. They were to be on equal ground with the biggest operators so far as "points" were concerned, and no such word as fail could be found in the lexicon of their calculations.

Where are they now? Well, the confidential clerk is in a lunatic asylum. One of the others is a street-car conductor at \$1.75 a day. A second is clerk in an insurance office at ten dollars a week. A third made his way West toward the Black Hills, and has not since been heard from. The last of the party of five still hangs around the street, watching the indications, but unable to put up even five dollars in a bucket shop. Their whole capital melted away in three months, and they were left without a dollar.

Here is another case: A retired business man of my acquaintance considered himself too smart to be beaten at any game. He lived in fine style, kept horses and a carriage, and was well known in society.

The Wall Street fever struck him and he began to speculate. He made out pretty well at the start and that led him into larger operations. In less than six months from the day he put up his first \$10,000 margin, he was an insolvent debtor, with suits against him by the brokers through whose hands all his money had passed! He now manages to scrape up a cheap living as an insurance agent, but he is hard pressed half his time for his beard.

Scores of such warnings against tempting the goddess of the Stock Exchange might be given, but so long as her snares are set, men will walk straight into them, with their eyes open, and the notes of warning will be raised in vain.

**A New Apparatus for Testing Petroleum.**

The uncertain and irregular results obtained by the flash test of petroleum in different hands has led to much dissatisfaction on the part of consumers, especially abroad. To get a uniform test, Mr. Holly, of the firm of Lockwood Brothers & Holly, of New York city, has devised a testing machine which was exhibited before a committee of the New York Produce Exchange, May 1, giving very promising results. By this method the poles of a galvanic battery are brought within three eighths of an inch of the surface of the oil, which is meantime being slowly heated by a lamp placed beneath a small retort. A thermometer attached gives the temperature of the oil, and at each degree of heat attained above, say, 90°, a discharge of electricity is applied, the spark at last producing an explosive flash in the gaseous fumes rising on the surface of the oil. These discharges are continued with the rising temperature of the oil until the flash extends into a flame, and the surface of the oil begins to burn.

A sample of oil, marked as flashing under the old test at 95°, flashed at 93° under the new test; and Mr. Holly stated that this test would always produce the flash on this sample of oil at a variation of not more than 2° from that point. The sample flashed at 93°, 94°, 99°, 104°, 108°, 112°, and 114°, and, finally, burned at 115°.

Subsequent experiments made by gentlemen present produced substantially similar results. All that is claimed by Mr. Holly for the machine is that it secures uniformity in the method by which the standard of the oil is determined.

**The Block Island Breakwater.**

The Block Island breakwater, begun nearly nine years ago, is at last completed. The enterprise has been attended with almost insurmountable difficulties, by reason of the severe storms which prevail at this place during all seasons of the year. The breakwater now affords a safe shelter for hundreds of mariners, and is a secure refuge for vessels. It extends almost due north from the steamboat landing, on the

east side of the island, a distance of 1,250 feet. The first work was done in October, 1870.

The main breakwater reaches at its northern extremity a depth of 18 feet, and contains about 65,000 tons of rip-rap. A detached pier, about 200 feet from the principal structure, is 300 feet in length, and contains about 28,000 tons of rip-rap. On the main breakwater there is a lighthouse near the 60 foot entrance to the basin. A mammoth basin has also been constructed, in which vessels drawing not more than seven feet of water may ride safely at anchor. There are contained in this structure 320,000 feet of timber (board measure) and 6,000 tons of stone. The total cost of the entire work was \$285,000.

Block Island is an isolated island in the Atlantic ocean, about midway between Montauk Point, at the Eastern extremity of Long Island, and Point Judith, R. I. It is eight miles long and from two to five miles wide.

#### THE EQUINE ANTELOPE.

A young animal of this species, from Nubia, has lately been added to the collection of the Zoological Society, at the gardens in Regent's Park. There was a specimen brought to London some time ago, which unfortunately died within

#### A Telephone Concert.

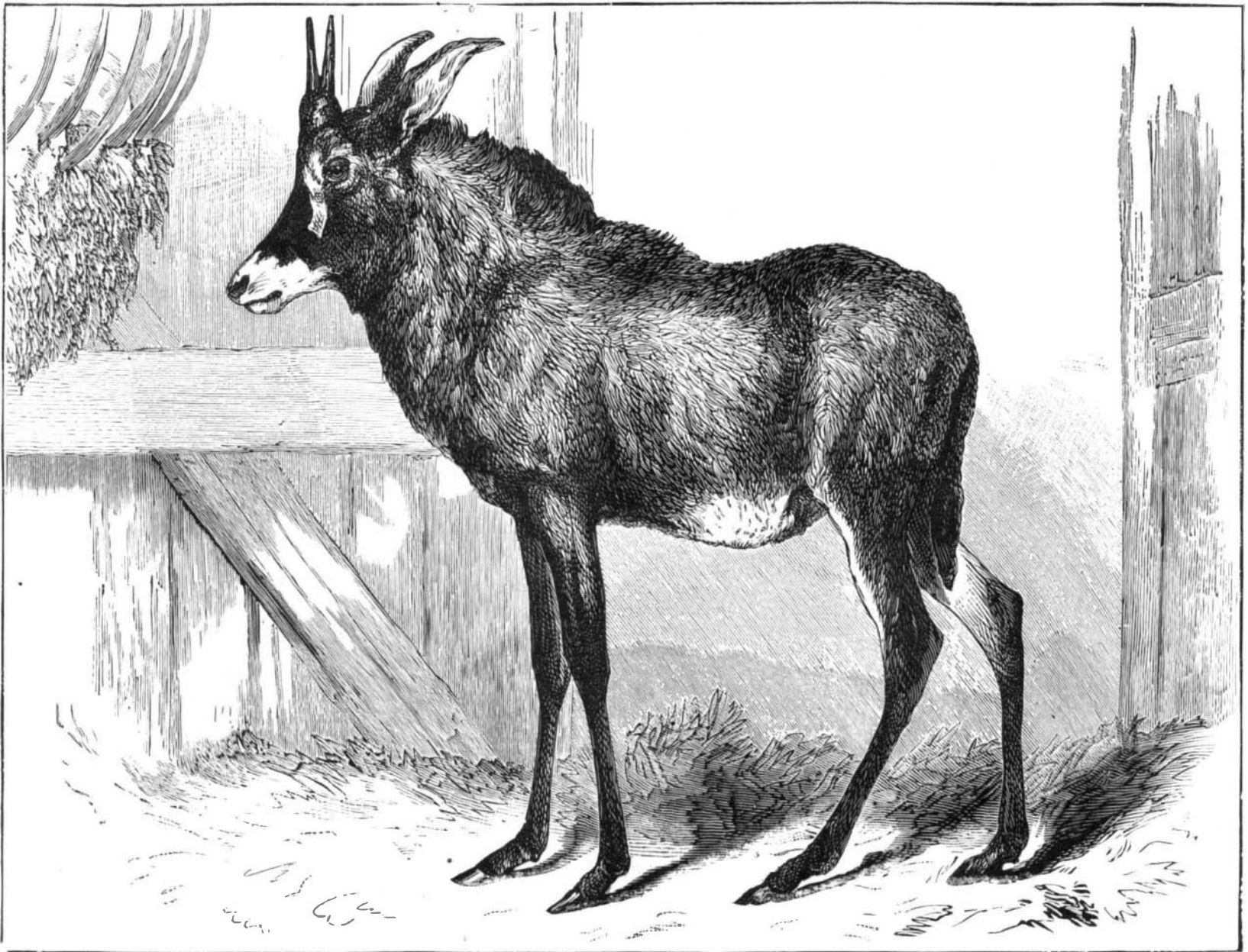
One of the most successful, and, in some of its features, peculiar, telephone concerts ever held, lately took place at the Wesley Chapel, Columbus, Ohio. Mr. Sidney Short delivered, at the church, his lecture on the "telephone." The lecture was illustrated by charts and apparatus. During the lecture demonstration of the practical operation of the telephone was given, which greatly surprised, interested, and gratified the audience. The arrangements of the apparatus were as follows:

Four Edison transmitters were placed in the Western Union main office, and two Phelps crown receivers at the church, a quarter of a mile distant. The lecture was delivered in the Sunday-school room, which is 50 feet square. The crown receivers were placed at one end of the room, and were provided with paper cones 4 feet long and 10 inches in diameter at the large end. With the apparatus thus arranged, a solo sung in the Western Union office was distinctly heard by the audience. After this, Mr. George Makepeace, of the State University, gave a cornet solo. Every note was distinct, yet as sweet and low as though heard from a distance, and coming over still waters on a quiet summer eve. When "Great Deliverer, Come," by the Wesley Chapel quartette, came through the instrument, not

lops, were described, and the species characterized. A beautiful specimen of an extinct skate, embedded in shale from Bear river, was exhibited and described. It belonged to a new genus of the family of trygons. The distinguishing characters are found in the teeth, which are like those of the genus raia, and in the spines of the tail, which are three in number, compressed and with one serrated edge. The name *Ziphotrygon acutidens* was proposed for the genus and species.

Professor Cope stated in this connection that, contrary to the assertion of Mr. Clarence King, no species of fossil fish was found common to the shales east and west of the Wasatch Range. The name *Amyzon* beds was given to the deposits west of the range, which were also found in the South Park.

Mr. John A. Ryder described a beautiful little crustacean found for the first time on this continent in the vicinity of Woodbury, N. J., by Mr. Seal, an indefatigable collector of the minute life of his neighborhood. The head is provided with robust claspers and two long, fleshy proboscis-like organs, which are coiled up between the claspers when at rest. The little creatures, which are about half an inch in length, are provided with eleven exquisitely delicate branchiæ on each side, by means of which they float gracefully on their



THE EQUINE ANTELOPE.

two or three days of its arrival, from disease contracted before. This one seems to be doing well, like most of the other antelopes in the collection, of which they form an important and interesting feature. The antelope genus of ruminating mammals, distinguished from the ox, the deer, the goat, and the sheep, includes nearly a hundred diverse species, the majority of which are natives of Africa; a few belong to Asia and Europe, while America has scarcely any true antelopes. Among the more conspicuous and familiar instances are the Persian or Arabian gazelle, the Indian nyloghau, the ibex and chamois of the Alps, the eland, the gnu, the springbok and blesbok, and others, in South Africa.

The equine antelope grows to as large a size as the eland, sometimes measuring as much as 7½ feet in length and 4 feet in height at the shoulder, or the ordinary stature of a horse. Its color is a reddish-gray, with brown head and a white spot over each eye; the horns are large and heavy, round in shape, and marked with a series of rings, except toward the points, which are very sharp; and the entire horn curves backward when fully grown. This species is also found in South Africa, inhabiting the plains of the Transvaal and other elevated parts of the country.

We present an illustration of the individual specimen of the Nubian race which has taken up its abode in London.

only were the tones of different parts distinct, but even the words could be understood in every part of the room. As an encore, "We're Going Home To-morrow," was given. This, also, was clear and sweet. A cornet duet by Messrs. Makepeace and Hyatt, and, in response to an encore, "Old Virginia" was given with equal success. The musical programme was closed by the Doxology. After a short conversation with Mr. Ross, at the Western Union office, Mr. Short, in a glowing tribute to America's work on this, the invention of the age, brought his remarks to a close. Every word spoken or sung at the office was not only distinctly heard by the entire audience, but the voices of the speakers and singers were recognized, and could have been distinctly heard in a hall capable of seating a thousand persons.—*Journal of the Telegraph.*

#### Academy Notes.

The *Public Ledger* report of the recent meeting of the Philadelphia Academy of Natural Sciences, contains the following interesting items:

Professor Edward D. Cope stated that he had in his collection a large number of specimens illustrating the natural history of the extinct rhinoceros from the Loom Fork horizon and elsewhere in the West, where these remains form more than one-half of all the fossils found. Four distinct genera, *anchisodon*, *hyrachodon*, *aceratherium*, and *aphe-*

back in the water. The specimen was named *Chirocephalus Holmani*, in honor of Mr. D. S. Holman, the Actuary of the Franklin Institute, from whom the specimen was obtained, in recognition of the services he has rendered in devising methods for studying living objects, both large and small, under the microscope.

Dr. Chapman exhibited and described the placenta of a species of monkey (*Macacus cynomolgus*) which was remarkable in being single, and thus differing from the placenta of the other Old World monkeys, except the chimpanzee.

Dr. C. N. Pierce called attention to a skeleton of a maori, dug out of the sand on the beach of Chatham Island, South Pacific Ocean, and presented to the Academy by Mr. Wm. H. Rau. He pointed out the fact that in the lower jaw the third molar was the largest instead of the smallest, as in civilized man, thus approaching the condition in the lower animals. Other peculiarities of dentition were noticed.

#### American Coal at the Mediterranean.

Since referring in our last issue to the fact that anthracite coal was advertised for sale in Geneva, Switzerland, we find the following item in the *New York Tribune*: The rumor that an Italian firm was negotiating in the United States for an immediate supply of 100,000 tons of coal, in place of obtaining it from England as heretofore, has caused uneasiness in London. A cargo of American coal reached