

Correspondence.

Fish Burrowing.

To the Editor of the SCIENTIFIC AMERICAN :

In Science Notes of January 8, 1898, I noticed an account of bass burrowing into the mud for the purpose of hibernating. A case of the German carp burrowing in the mud has come under my notice. Previous to the draining of one of my father's ponds many large carp were seen swimming around, but after draining the pond only a few were seen lying about. After some investigation the remaining ones were found in burrows which they dug in the mud. This pond was drained several times during the summer, and from this fact it would seem probable that the fish took this means of concealment during the operation.
Swarthmore College, Pa. WILLIAM M. MAULE.

The Pole and Chimney Problem.

To the Editor of the SCIENTIFIC AMERICAN :

I wish to call attention to a point in your reply to Notes and Queries, No. 7,293, in the January 8 issue of the SCIENTIFIC AMERICAN. The method of solution is correct, but in stating it Prof. Filkins, in the sixth line, says "for maximum l," etc. This should read for minimum l, since it is evidently the minimum value of l that determines the possibility of the rod being pushed up the chimney. It is also evident that the maximum value of l to fulfill the equation in the fifth line is infinity.
DARRAGH DE LANCEY.

Rochester, N. Y., January 9, 1898.

[We do not agree with our correspondent that the solution should read "for minimum l," etc., since the question asked for the longest pole, and "l" is the length of the pole. It is an entirely different point to show that the longest pole which will pass the three points on the line, l, as drawn, is also the shortest line which can be drawn from the back of the chimney past the front of the chimney to the floor. It is not "evident," as this letter states, that "the minimum value of l determines the possibility of the rod being pushed up the chimney." It becomes known when "l" is proved to be the minimum line, and is not axiomatic.—EDS.]

Raising a Stranded Cruiser.

Electrical appliances have been of much service to Russian engineers in the recent work of raising a great ship, says The Western Electrician. The cruiser "Rosalia," 480 feet long and of 12,000 tons displacement, one of the largest ships of the Baltic fleet of Russia, ran aground a year ago on a bank of the Neva in 20 feet of water. The water fell afterward so that the boat pressed on the sand and gravel below with a load of 2,500 tons. Attempts to pull her off having failed, the Admiralty applied to the imperial school for divers at Kronstadt. Operations were begun in the middle of winter, when the ice was so troublesome that the cruiser could not be kept clear, and the operations had finally to be conducted from tents erected on the ice. The first thing was to ascertain exactly how the boat was lying. For this purpose long poles were fixed in the bottom in an oblique position close to the hull; the divers, descending along these poles and communicating by telephone with the men above, took their measurements by means of the plumb line. The rudder was found to be free; most of the keel was buried in the ground. When the relief had been mapped out, an iron pipe 60 feet long and 2 feet in diameter was inserted in the soil underneath the keel, and the keel cleared in this way. The hydraulic current was so strong that one of the divers was upset, though 60 feet away from the mouth of the pipe, and the 200 candle power electric lamps which the divers had did not penetrate through more than a foot of the turbid water. But the process was entirely successful. By the middle of December only a small part of the keel was still embedded. The operations were carried out in a thoroughly scientific and practical manner. The success is partly attributed to the telephone and the electric lamps, which did a good deal to cheer the divers up. They could never bear the cold for more than half an hour. The outfits had been obtained from France. In the cold water the rubber shirts became quite brittle and had constantly to be reheated; the air pumps also needed heating; the automatic valves contracted so much that the divers were soaked; the leather collars of the helmets broke when the divers put their dress off again.

Death of M. Bazin, Inventor of the Roller Steamboat.

Advices from Paris, of January 21, announce the death of M. Ernest Bazin, the inventor of the roller steamboat, which was designed to avoid the friction of the water against the hull as the boat was forced forward by the rotation of drum-like wheels of large flotation capacity. The trial boat was about 250 feet long, and had three pairs of such supporting wheels, each driven by a separate engine. Full particulars of this boat, with ample illustration, will be found in SCIENTIFIC AMERICAN SUPPLEMENT, No. 1143.

Recent Archaeological News.

The castle of Godfrey of Bouillon in the Ardennes is to be restored by King Leopold, of Belgium.

Leonardo da Vinci's anatomical studies from the manuscripts in the royal library at Windsor have just been published for the first time at Rome, edited by Prof. Pinnati, under the title, "Dell' Anatomia." Besides the artist's notes over 250 drawings are reproduced.

Thorwaldsen's "Lion of Lucerne," cut in the living rock, is cracking and crumbling away, owing to the infiltration of water in the sandstone cliff of which it forms part. It is to be preserved by isolating it from the main body of sandstone and draining the ground around it.

Aurelian's city wall along the left bank of the Tiber is to be torn down, as neither the Italian government nor the Roman municipality will repair it. It contains fragments of older walls, including, it is believed, part of the wall of Servius Tullius, and has been repeatedly repaired by later emperors and by some of the popes.

A decorative art commission has been formed in Paris under the name of "Société de l'Art Precieux de France," with Gérôme, the painter and sculptor, at its head. Its object is to improve the artistic standard of French "objects of art." Works approved by it will be stamped with its mark, which will serve as a guarantee to purchasers, and only French productions will be examined.

The class of 1881 of the University of Princeton has added to its memorial collection of ancient casts in the Art Museum a valuable series of casts of ancient sculpture on the Triumphal Arch of Trajan at Beneventum. The casts for nearly all of the sculptures were made for the first time by the American School of Classical Studies in Rome, under the direction of Prof. A. L. Frothingham, Jr., two years ago.

Excavations have been made recently in the remains of the old Roman colony, Vindonissa, at Windisch, Switzerland. The most important results are the disinterment of large Roman villas and the amphitheater, besides a quantity of coins, pottery, bronze, iron ware and some large silver vessels, which have their equals only in the famous treasure trove of Hildesheim, Germany, brought to light in 1868.

Prof. Dörpfeld, the Director of the German College of Archaeology, at Athens, who has been engaged in excavations between Pnyx and the Areopagus, believes that he has discovered the ancient system of drainage, with all its ramifications. The pipes, which are in an admirable state of preservation, conducted to the various quarters of the city the water flowing from Mounts Pentelicus and Hymettus, and the small streams from the Acropolis, as is shown by the stalactites still visible. The drains are large enough to permit of a man walking upright in them for a considerable distance.

In the heart of the little town of Santa Barbara, California, an archaeological excavation of interest is in progress, says The Antiquarian. A few months ago the accidental discovery was made that the heights of Castle Point had been long ago an Indian burying ground. At once Mr. Louis Dreyfus began excavations, which are not yet completed. But already plenty of bones, dust of bones, spear heads, stone implements, arrow heads, shells and beads have been brought to light. This discovery is rather significant, in that it is thought to be the initial point for prehistoric study in all this region.

The excavations that have been going on for months past on a plot of ground belonging to Herr Schabb, a manufacturer at Treves, have resulted in the discovery of a Roman private house, which will excite the interest of antiquaries almost as much as the famous public buildings at Augusta Trevirorum. The front of the house, says The London Standard, lies parallel with the principal street of the old Roman city. A number of blocks which served as pedestals for the wooden or stone pillars of a portico still remain. The entrance is distinctly recognizable between two buttresses and an immense heap of stones. A long entrance hall running right through the house, from front to back, is intersected by another corridor, so that the gigantic building is divided into four parts. Side corridors lead into the rooms. Of these, the marble tessellated bath rooms for hot and cold water and warm air lie side by side, and deserve special mention. The two latter were supplied with warm air through subterranean passages. The escape of the smoke was effected by means of hollow tiles laid on one another. The southwestern rooms have cellars under them. In a light court in the same part of the house there is a well-preserved window, the first ever found in a Roman building. The most interesting thing, however, is the magnificent and richly colored mosaic floor, a rarity of the first order. Experts assign the building to the first half of the fourth century, when Augusta Trevirorum attained the zenith of its splendor under Constantine and his sons.

Science Notes.

Experimenting with gold fish on the relative toxicity of the alcohols, Picard finds that this is directly as their molecular weights, and after a long series of experiments, concludes that the relative toxicity may be expressed by the following figures: Methyl alcohol, $\frac{2}{3}$; ethylic, 1; propylic, 2; butylic, 3; amyllic, 10. These results are contrary to those of Dujardin-Beaumont, in so far he found methyl to be more poisonous than ethyl alcohol.—Comptes Rendus, cxiv, 829.

The researches and experiments of Messrs. Broca and Richet, specialists in this line, have led them to the interesting conclusion that the cerebral nervous system is really incapable of perceiving more than the average of ten separate impressions per second. The mental phenomena in this case show that after each excitation of the nerves a period of inertia follows, lasting about one-tenth of a second, and during this brief period no new or appreciable impression, they declare, can possibly be made. Further, according to the studies of these same eminent authorities, an individual cannot make more than ten or, at most, a dozen separate voluntary movements of any kind or nature in a second, although the muscles, independently of the will, are capable of making as many as thirty or forty.

Prof. Lippman, of Paris, gave on December 18 an interesting lecture before the Photographic Society in London on the process of photographing objects in natural colors. He declares that he has solved the problem of directly fixing colors with a single exposure. After the sensitive side of the plate or film has been rendered grainless and transparent it is brought into contact with a metallic mirror. The contact is effected by a falling slide from behind with mercury, which after the exposure is let down into a reservoir, the plate being taken out for development, which is managed in the ordinary way. The result is a negative upon which, as the process of drying goes on, the colors appear true and bright in proportion as the exposure and development have been correct. Several specimens were shown, and the effect obtained was excellent.

The Lancet states that a surgeon in the United States Navy reports as the result of an examination in Japan the finding in that country, among 1,200 soldiers, some 1.58 per cent who were red blind and 0.833 per cent who were green blind; among 373 boys, 1 per cent were red blind, and among 270 girls, 0.4 per cent. Of 596 men in Kioto, 5.45 per cent showed defective color sense. Dr. Fielde, of Swatow, China, examined 1,200 Chinese of both sexes, using Thompson's well-known wool tests; among 600 men were nineteen who were color blind, but among 600 women only one. It seems, therefore, that the percentage of color blindness among Chinamen is about 3 per cent, and consequently does not vary greatly from that in Europeans. It was found, however, by Dr. Fielde that fully half the number who were tested mixed up blue and green, and, according to this investigator, many of that race are quite blind to the perception of violet colors.

Under the title of "Electric Balloon Signaling applied to Scientific Exploration in Arctic and Antarctic Expeditions," a lecture was delivered at the Imperial Institute on Monday, November 22, by Mr. Eric Stuart Bruce, M.A. Oxon., F.R. Met. Soc. The lecturer demonstrated by various experiments the system of electrical balloon signaling invented by himself. In this system several incandescent electric lamps are placed inside a translucent balloon made of goldbeater's skin. By varying the flashes of light in the balloon, signals are given according to the Morse or other code, the operator remaining on the ground. Want of such means of communication between the ship and exploring parties in Arctic exploration was fraught with danger, while, if the light were raised 500 or 1,000 feet above the vessel, its value would be incalculable. The various objections to the system were considered in detail, Mr. Bruce concluding a most interesting lecture by a number of striking experiments illustrating the advantage of his system.

Dr. Campbell Morfit, the distinguished American chemist, died in London on December 8, in his seventy-eighth year. Dr. Morfit was born in Herculaneum, Mo., on November 19, 1820. He was educated at the Columbian University, Georgetown, D. C., but before graduation took up the study of chemistry in the private laboratory of James C. Booth, in Philadelphia. He originated the chemical department of the Maryland Institute, and in 1854 became professor of applied chemistry in the university, where he remained for four years. In 1858 he removed to New York, where he followed his profession until 1861, when he went to London. He was a member of various scientific societies and a fellow of the Chemical Society of London and of the Institute of Chemistry. Besides writing numerous scientific papers, he was joint author with James C. Booth of a report to the United States Ordnance Department on gun metal, in 1853, from investigations by him in a laboratory that he established on his own plan at Pikesville Arsenal, Maryland. He was co-editor with Dr. Booth of the "Encyclopedia of Chemistry" and published many works.