Correspondence.

How to Remove Green Scum.

To the Editor of the Scientific American:

I read an account in your paper dated October 22, 1892, *re* drinking water, etc., in San Francisco, which states that water in tanks, after a time, becomes covered with green scum.

I am in charge of the water supply of Hughenden, for which there is a large tank. I had noticed the accumulation of green scum, as mentioned, which I thought was caused by the sun. So had a covering erected (allowing an opening each side for the free play of the air), and have found that the water is now quite free from the accumulation. J. F. SCOTT,

Engineer in charge water works.

Hughenden, Queensland, Australia, Jan. 13, 1893.

Two Noted Entomologists.

BY PROF. C. V. RILEY.

The news of Professor Westwood's death, which reaches me while away from home seeking health, prompts me to send you a short notice of him, as also of another noted English entomologist who lately passed away.

HENRY TIBBATS STAINTON

was born August 13, 1822, and died December 2, 1892, at his home in Mountsfield, Lewisham, England. He had been ill for some months, growing each day feebler, but retaining his mental faculties till the last. Educated at home and at King's College, and for some years engaged in business, he early developed a fondness for entomology, and gradually worked more and more in the order lepidoptera and finally in the micro-lepidoptera, in which he came to be looked upon as the highest authority. He was a frequent contributor to the natural history periodicals of his time and originated "The Entomologist's Weekly Intelligencer" (10 vols., 1856-61) and "The Entomologist's Annual" (20 vols., 1855-74). He was one of the founders of "The Entomologist's Monthly Magazine" and one of its editors to the last, and was instrumental in founding "The Zoological Record." His separate works number a score, among the most important of which are the following:

"A Manual of British Butterflies and Moths," 2 vols., 1857, 1859, the best work of its kind ever published in the language.

"The Natural History of the Tineina," 13 vols., 1855-73, illustrated by colored plates and printed in English, French, German, and Italian. This is one of the classics in the science and served more than any other of his works to give him world-wide fame.

"The Tineina of North America," by Dr. Brackenridge Clemens, a collected edition of the latter's writings upon the subject, with notes by the editor, H. T. Stainton, 1 vol., 1872. This was a great help and stimulus to American students of the group, as Clemens' writings had been scattered through odd volumes of the Proceedings of the Philadelphia Academy of Natural Science and elsewhere.

I first had the pleasure of meeting Mr. Stainton in 1871, and on several occasions subsequently enjoyed the hospitality of his beautiful and secluded home at Lewisham.

Kind-hearted and modest, almost to a fault, he yet impressed one with his good sense and intellectual force. With ample means, he remained an industrious worker through life, and found his pleasure not in the vanities of society, but in quiet study and active interest in everything that tended to promote his favorite science.

JOHN OBADIAH WESTWOOD

was born at Sheffield, December 22, 1805, and had just completed his 87th year. He was educated in a Friends' school, and early evinced a love of natural history and great gift for drawing—two faculties that often go together. Though he began life as a lawyer he became more and more absorbed in science and literature, and finally made a specialty of entomology. There has been no more voluminous writer on insects, and no one of his generation whose luster outshines his. Almost all his contributions to knowledge were beautifully illustrated by his facile pencil, while some of his works, like his "Arcana Entomologica," are sumptuous in the richness of their plates. I will make no attempt to enumerate the many important works of one who was constantly publishing during a period of more than sixty years, but his "Introduction to the Modern Classification of Insects," though over half a century old, has justly been called the entomologists' Bible, and alone would have made him famous. He was a founder of the London Entomological Society, of which he has been for the last ten years honorary life member. But Westwood was not only an eminent entomologist, he was an authority in ivories and inscribed stones, and a noted archæologist. His talent, industry, and wide observation are exemplified in his "Palæographia Sacra Pictoria;" his "Facsimiles of the Miniatures and Ornaments of Anglo-Saxon and Irish MSS.;" his "Book of Kells," and his "Lapidarium Walliæ."

I remember my surprise on one of my visits to his home in Oxford—an old fashioned English mansion in the midst of a beautiful garden—at the great industry and extensive travel which these works and his archæological collections indicated.

While he did a great deal of descriptive work in entomology, he was most deeply interested in the biologic side of his favorite science, and fully appreciated the importance of its economic bearings. He was the first to characterize one form of the notorious grape phylloxera as *Peritymbia vitisana*, and was a constant contributor to the *Gardeners' Chronicle.* He met with an accident some five years ago which influenced his health, but did not prevent his working till the very end. He was of the true Saxon type, simple and hearty in disposition, with fair and kindly face, long flowing side and chin beard, and beautiful large blue eyes which twinkled with humor. Of late years he held the Hope Professorship of Zoology in the University of Oxford, and he was fond of relating how some question as to his religious views, when his appointment was being considered, was set at rest by a happy *mot* of the public orator—that he was not a "sectarian," but an "insectarian"!

Hot Springs, N. C., January 23, 1893.

NEW MERCURIAL COMPENSATION PENDULUM.

Of the different compensation pendulums hitherto employed, the mercurial compensation pendulum, invented in 1721 by Graham, of England, enjoys the best reputation, for which reason it has been used in nearly all astronomical and other pendulum clocks of precision.

But this pendulum has defects, among which are incorrect functioning when the temperature of the air differs at different levels, and sensitiveness to sudden changes of temperature. Besides, the shape of the Graham pendulum prevents it from cutting the air easily, and consequently changes in the atmospherical pressure exercise a comparatively strong influence on the running of a clock having such a pendulum.

Riefler's Mercurial Compensation Pendulum.

The defects are almost entirely obviated by the mercurial compensation pendulum of S. Riefler, of Munich, shown in the cut, which illustrates a seconds pendulum one-tenth of actual size.

It consists of a steel tube, bore 16 mm., thickness of metal 1 mm., filled with mercury to about two-thirds of its length. The pendulum has, further, a metal bob weighing several kilogrammes and shaped to cut the air; below the bob are disk-shaped weights, attached by screws, for correcting the compensation, the number of which may be increased or diminished as appears necessary.

While in the Graham pendulum correction is effected by altering the height of the column of mercury, in this pendulum it is effected by changing the weight of the pendulum, leaving the height of the column of mercury the same.

The inventor states *that the probable error of compensation in these pendulums will not exceed* ± 0·005 *second per diem and* ± 1° *variation in temperature.*

A number of these pendulums have already been constructed, some of which have been running for more than a year. They are in use in the observatory in Munich, giving great satisfaction. The precision of this compensation, which was discovered by purely theoretical computations, has been thoroughly established by the records of their running at different temperatures.

The adjustment of the pendulums, which is, of course, almost wholly without influence on the compensation, can be effected in three different ways:

(1) The rough adjustment, by screwing the bob up or down.

(2) A finer adjustment, by screwing the correction disks up or down.

(3) The finest adjustment, by putting on the additional weights.

These weights are to be placed on a cup attached to the rod of the pendulum. Their shape and size is such that they can be readily put on or taken off while the pendulum is swinging. Their weight bears a fixed proportion to the static momentum of the pendulum, so that each additional weight imparts to the pendulum, for twenty-four hours, an acceleration precisely expressed in seconds and marked on each weight.

Each pendulum is accompanied with additional weights of German silver for a daily acceleration of 1 second each, and ditto of aluminum for an acceleration of 0·5 and 0·1 second respectively.

A pointer is attached to the lower end of the pendulum, for reading off the arc of oscillation.

These pendulums are delivered with the compensation fully adjusted, thus avoiding all correction of the compensation, such as is necessary with all other compensation pendulums, and can generally be arrived at only after tedious experiments.

Launch of a Great Battle Ship.

An ironclad battle ship of the first order was launched at the Cramps' shipyard, Philadelphia, on February 28, and was christened the Indiana. She is the largest vessel built thus far on this side of the Atlantic, and the launch was witnessed by President Harrison, Secretary Tracy, and a large number of distinguished guests. She is of 10,200 tons displacement, having a length of 348 feet, a breadth of 69¼, and a mean draught of 24. The contract price for her hull and machinery is $3,020,000. The engines are twin screw, of the vertical, triple expansion, direct acting, inverted cylinder type, placed in water-tight compartments separated by bulkheads. The diameters of the cylinders, high pressure 34½ inches, intermediate 48 inches, low pressure 75 inches, stroke 42 inches. The condensers are of composition and sheet brass, each main condenser having a cooling surface of 6,353 square feet. The circulating pumps are centrifugal and independent. There are four double-ended and two single-ended auxiliary steel boilers of the horizontal return fire tube type. The main boilers will be about 15 feet outside diameter and 18 feet long, and the auxiliary single-ended boilers will be about 10 feet 2 inches diameter and 8½ feet long, all constructed for a working pressure of 160 pounds per square inch. Each double-ended boiler will have eight corrugated furnace flues 3 feet internal diameter. The total heating surface of the main boilers is 17,460 square feet and grate surface 552 square feet. The auxiliary boilers have a grate surface of 64 square feet and a heating surface of 1,937 square feet. The vessel has a powerful ram bow, and is divided into a great number of water-tight compartments by means of longitudinal and transverse bulkheads of 10 and 12 pound plates.

According to Secretary Tracy, the battery of the Indiana will be "the heaviest and most effective in battle carried to-day by any ship afloat or projected, and its disposition is such as to make it tell with terrific effect. Above the armored deck, 80 feet from the center of the ship, rise two redoubts, inclosing the foundations of revolving turrets, within which are the four great 13-inch rifles, 18 feet above the water, and sweeping through a clear arc of 270 degrees, forward and aft and on both broadsides. Above these, on the heavy superstructure between the turrets, 25 feet above the water line, and therefore capable of firing over the turrets, are eight 8-inch rifle guns that, at two miles, can pierce the armor of many modern ships. Four 6-inch guns complete the main armament. The secondary battery consists of sixteen 6-pounder rapid-firing guns, four 1-pounders, and four Gatlings, so disposed that a rain of projectiles can be thrown upon every point of approach, sufficient to destroy any light boat that may venture within range."

Of the six torpedo tubes, one is fixed at the bow and another at the stern, while on each broadside are two others, firing through five inches of protection.

The armor of the Indiana has a water line belt, 3 feet above and 4½ feet below the water line, making 7½ feet in total breadth of armor 18 inches thick. It extends along three-fourths of the ship, and turns in forward and aft, where it sweeps around the base of the redoubts. These latter are 17 inches thick, and extend 3½ feet above the main deck. They protect the turning gear of the turrets and the loading. The turrets have 17 inches of armor, at first planned to be inclined but now vertical.

There are also heavy, under-water, sloping, protective decks, while water-excluding material on the slopes of the decks, the protection of the coal bunkers, and many watertight compartments will assist in her invulnerability.

Impressions in Sulphur.

M. Lepirre, a French artist, states that in demonstrating that sulphur melted at about 115° can be cooled in paper, he happened to use a lithographed card, of which the edges were turned up. Upon taking away the card it was discovered that the lithographed characters were clearly and distinctly impressed upon the cooled surface of the sulphur, remaining thus after hard friction and washing. By repeated experiments in this direction he has succeeded in obtaining results of a very satisfactory character, removing the paper each time by a mere washing and rubbing process. It is found, in fact, that sulphur will receive impressions from and reproduce, in a faithful manner, characters or designs in ordinary graphite crayon, colored crayons, writing ink, typographical inks, china ink, lithographic inks—whether colored or uncolored varieties—and others. He also states that it will reproduce with remarkable exactitude maps.