Correspondence.

Locomotive Superheaters.

To the Editor of the SCIENTIFIC AMERICAN:

In a description of a superheater for locomotive boilers, which appeared in your impression of June 4 (page 4[illegible]) [illegible] that superheaters for locomoti[illegible] [illegible] before 1898.

In the year 1863 several freight engines were built for the Northern Railway of France, having tubular superheaters in the smokestack. Drawings of these engines will be found in Colburn's "Locomotive Engineering and Mechanism of Railways."

Some time prior to the year 1860, Sharp, Stewart & Co., of Manchester, England, built a locomotive for the Egyptian government railway, which had a superheater. The upper part of the smokebox was partitioned off, forming a perforated chamber, through which the steam was passed on its way to the cylinders. Drawings of this engine were published in Clark and Colburn's "Recent Practice in the Locomotive Engine." HERBERT T. WALKER.

Mt. Vernon, N. Y., June 3, 1904.

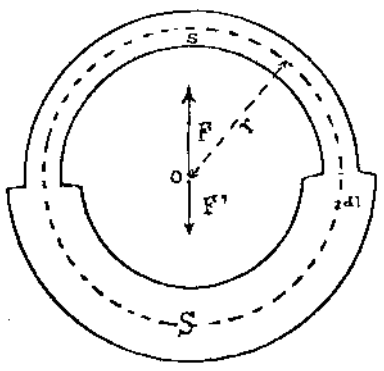
Another Paradox.

To the Editor of the SCIENTIFIC AMERICAN:

In the SCIENTIFIC AMERICAN of April 23 I read an article entitled "An Interesting Paradox," by Daniel F. Comstock, who leaves to the insight of the reader the discovery of the fallacy in the system of perpetual motion.

I propose another interesting paradox:

A circular closed tube, one-half of the section represented by S, and other half of the section repre-



sented by s, is filled with water, circulated by a pump or other engine connected with the tube.

Assume the velocities of water through the sections s and S to be respectively V and v.

Thus $Sv = sV$.

The centrifugal force of water through the section S on a length dl is:

$$\frac{S\ dl\ v^2}{g\ r} = dF'$$

and through the section s this force is:

$$\frac{s\ dl\ V^2}{g\ r} = dF$$

$$F = F'\ S/s$$

Hence, the centrifugal force of the side s being greater than of the side S, an interior force moves the center of gravity of the system, pump and tube, without any exterior force. EMILIO HERRERA,

Officer of Spanish Royal Engineers.

Melilla, Morocco.

A Civic Museum for New York.

To the Editor of the SCIENTIFIC AMERICAN:

A sub-committee of the Andrew H. Green Memorial Association, having in charge the question of determination of the form of a memorial to the man whose name is more intimately associated with the creation of the present city of New York than any other, has received a number of proposals, some of which are of elaborate description, while others take the more modest form of a simple statue. But among the suggestions one stands apart by reason of its appropriateness and public usefulness, and this is a plan for a Civic Museum for New York.

The model for such a museum is furnished by the Museum Carnavalet in Paris, which, although one of the lesser museums in that city of great museums, has long been one of the most interesting collections in the world. It illustrates, in a very thorough degree, every stage of the growth of Paris, and its contents include a wonderful collection of objects of art and historic interest.

The material available for such a museum in New York would, of course, be very different from that available in the case of Paris, with its history of centuries; but it would, nevertheless, be of the deepest interest, and of an interest that must increase with each year of growth. The scope of the proposed museum would be very different from that of an historical museum or an art collection, although it would have some of the qualities of both. Its primary object would be to illustrate New York as a city; to gather up matters of historic interest having civic significance, to preserve models, plans, proposals, and studies for public improvements; and to preserve matters which, familiar enough to living citizens as every-day affairs in metropolitan life, would soon pass away and be forgotten without some recognized place of deposit and preservation.

Civic development, and more particularly in relation to its artistic development, is a subject in great popular favor at the present time. Many proposals and efforts are being made in this direction, not a few of which are early lost to view because they are not immediately put into execution. A positive service to the community would be afforded by the creation of a museum where such studies could be preserved, and where they might be available for future students working along similar lines. The proposed Civic Museum for New York would fill this public need, and it might also serve as a center where much material now absolutely unavailable could be placed.

The Civic Museum would occupy a field peculiarly its own, and would add greatly to the museum resources of New York. No such institution exists at present in America, and both for distinctiveness and usefulness this project merits the favorable consideration of the committee having the Green memorial in charge. It is a plan that must interest many New Yorkers, apart from whatever interest they might have in Mr. Green, and the museum once started, must command the support of the entire community.

New York, June 10, 1904. BARR FERREE.

New Laboratory Buildings for the National Department of Agriculture.

BY E. W. ALLEN.

Plans are being completed for a series of buildings for the Department of Agriculture at Washington, and it is expected that the work of construction will be commenced this summer. The present buildings were built when the department was much smaller, and before it had developed into the most extensive institution for agricultural research to be found in the world. The growth of its laboratories has necessitated the renting of several large buildings near the department grounds, and the conversion of numerous dwelling houses into laboratories. The department this year will expend nearly $40,000 for rent in Washington, and even then will secure only poorly adapted quarters.

In 1902 Congress was asked to appropriate $2,500,000 for new buildings, to consist of a central administration building with laboratory wings on either side. The latter were to be connected with the administration building by covered passages, the whole presenting an imposing front of about 750 feet, with a court in rear. Congress reduced the appropriation to $1,500,000, and with this amount the two laboratory wings will now be put up, leaving the completion of the scheme until a further appropriation is obtained.

The location selected is in rear of the present main building, and facing the 900-foot parkway which is projected from the Capitol to the Washington Monument. It will necessitate the removal of several frame structures, used for museum, office, and storage purposes, but for the most part the present buildings can remain until the administration building is completed.

The laboratory wings will be L-shaped, each having a frontage of 256 feet, and the ell extending 100 feet to the rear. They will be separated by an opening of 220 feet, reserved for the administration building. Each wing will be four stories in height above a high basement and a sub-basement. The depth from front to rear will be about 60 feet, the space on each floor being divided by a 12-foot central corridor, so as to give a series of units about 20 by 22 feet on either side. The windows and doors are so arranged that these rooms can be divided by temporary partitions if desired.

The construction will be fireproof and of the most modern character throughout. The permanent partitions at right angles to the corridors will be of brick and hollow, leaving clear spaces extending from the sub-basement to the attic. In these will be carried the hot-air flues for heating and the flues for ventilation. Each room will have two hot-air flues, two ventilating flues, and two flues for carrying off the fumes from hoods.

The buildings will be heated by indirect radiation, the heat being supplied by a power plant located in a special building. The system adopted is quite complicated, but will allow absolute control of the temperature of each room independently of any other room, and will supply filtered and moistened air. Each laboratory will be supplied with hot and cold water, distilled water, gas, compressed air, suction, live steam, and electricity, from machinery located in the power house, and the apparatus for grinding and other purposes will be run by electric power. The supply pipes will be carried in pipe shafts, which will make the risers accessible at any point, and in installing these provision will be made for supplying every room in the two buildings, so that they may be converted into laboratories whenever desired. All piping will be exposed, the laterals being suspended from the ceiling of the room below and brought up through the floor at desired points. A lead-lined soil pipe in each of the hollow partitions will carry off the waste.

Although a great variety of laboratory work will be conducted in these buildings, the construction will be uniform throughout, and will not take into account the special needs of laboratories for chemical analysis, soil work, botanical investigation, and the like. The facilities provided in all parts of the two wings will be so complete that the adapting of a series of rooms to a particular kind of work will be merely a matter of installing equipment and making connections with the supply pipes. This plan will allow changes in the assignment of quarters to be made readily in future, as the needs in a particular line of work grow.

The exterior walls will be of solid masonry, either marble or granite. The laboratory floors will be of concrete, with maple in the offices, and the walls and ceilings will be of cement plaster painted with enamel paint. The total floor space provided by each wing will be 80,000 square feet, including the corridors, leaving about 55,000 square feet in each building available for laboratory and office rooms. The architects are Rankin, Kellogg & Crane, of Philadelphia; and the supervising engineer is Major John S. Sewell, of the War Department.

Electrolytic Method of Estimating Gold.

At a recent meeting of the Faraday Society, Dr. F. M. Perkins and Mr. W. C. Prebble gave the results of researches to arrive at an electrolytic method of estimating gold which should be perfectly accurate, and yet far more rapid than the ordinary double cyanide method which the authors, differing from Classen, consider inordinately long, even in hot solutions. Solutions of sodium thiosulphate, cyanide, sodium sulphide, potassium thiocyanate, and ammonium thiocyanate were all tried and the results compared. The first-named was useless; of the others—which are all accurate—the thiocyanates gave the best results and the ammonium salt was better than the potassium. With currents of 0.2 ampere per square dcm., the deposition of 0.05 to 0.08 gramme of gold was complete in 5 or 6 hours. With a current of 0.4 to 0.5 ampere, 1.5 to 2 hours sufficed. The presence of a little persulphate considerably reduced the voltage required. Experiments were also made to determine the best method of removing the deposited gold. Chlorine or bromine water was satisfactory, but slow; aqua regia was risky; the authors recommended a 2 per cent solution of potassium cyanide containing a little hydrogen peroxide or a persulphate. One or two minutes then sufficed to remove the gold.

The Bound Volume of the Scientific American Building Monthly.

Volume XXXVII of the SCIENTIFIC AMERICAN Building Monthly, comprising the numbers for January to June, 1904, is now ready for delivery. This sumptuously illustrated book contains 311 illustrations, 6 covers in tint, and 132 pages. There are 84 large pages of original photographs and plans of dwelling houses of all costs, forming a veritable encyclopedia of contemporary domestic architecture. The special features of the present volume include "Whitehall," the house of H. M. Flagler, Esq., at Palm Beach, Fla.; "Faulkner Farms," the estate of Mrs. Charles F. Sprague at Brookline, Mass.; the house of E. J. Berwind, Esq., at Newport, R. I.; "Grey Craig," the magnificent castle of J. Mitchell Clark, Esq., at Newport; and "Blairsden," the superb country seat of C. Ledyard Blair, Esq., at Bernardsville, N. J. There are editorial articles on "Some Home Builders and What They Did;" "House Education;" "The Interest of Houses;" "The House of the Future;" "The Small House;" "The Association of Houses." The numerous departments constitute a "review of reviews" summary of current comment, suggestion and help in all matters relating to the construction of the home, its decoration, equipment, and use. The price of the bound volume is $2, postage paid.

The Current Supplement.

The current SUPPLEMENT, No. 1486, opens with an excellently illustrated and well-written account by Emile Guarini on "Typical Automatic Weighing Machines." John E. Thornycroft, England's veteran engine builder, discusses the advantages of gas and oil engines for marine propulsion. "A Novel Four-Piece Mechanism" is the title of an article by the English correspondent of the SCIENTIFIC AMERICAN. "The Telefunken Ondometer for the Measurement of Wireless Telegraphic Waves" is described in full. Prof. Vivian Lewes, whose work on the chemistry of illuminating gases is well known throughout the world, publishes an instructive essay on reducing the candle-power of gas. Walter Fewkes' preliminary report on an archeological trip to the West Indies is concluded. "How Gold Leaf is Beaten" is fully described.