Correspondence.

Gun Erosion.

To the Editor of the SCIENTIFIC AMERICAN:

I have read with a good deal of interest your article on gun erosion, and from your description of the cause, it seems to me that if the rifling did not come quite to the powder chamber, and the rear of the shell was fitted with a copper disk, with the edge slightly curved so as to form a shallow dish, the force of the gases would drive the edges of the disk into the grooves in such a manner as completely to close all opening until the rings on the shell had been driven into the riflings. It seems to me that a half-inch flare would be no detriment to the shell, and should furnish enough pliable material to fill the grooves. I notice too that in comparing our older ships with the newer ones, you always speak of the advantage which the new ships possess in gun fire. I see no reason why this should be so. Could not our older ships be re-gunned and made as effective as the newer ones? The old guns could be used in land defenses, where space is not so expensive, and where they could render effective service. Let us take the "Iowa" and "Minneapolis," and arm them with the newest guns, and we believe both would, ton for ton, render a good account of themselves. It seems to me the "Minneapolis" and "Columbia" could each be strengthened and a modern 10-inch gun substituted for the old 8-inch. There is certainly no lack of room on either ship.

Manson, Ia., September 20, 1906. T. D. LONG.

[The use of a copper base-plate of the kind suggested by our correspondent was tried by Vickers-Maxim, but seems not to have been successful. The re-arming of old vessels has been carried out on some of the ships of the United States navy; but it is not generally favored here or abroad. It is considered that the money voted for naval purposes is better spent if it is used on new construction.—ED.]

The Use of the Hyphen.

To the Editor of the SCIENTIFIC AMERICAN:

I have read your journal for many years with more or less regularity, and now have it every week. I always feel, after reading a copy, that I have traveled a good many miles for a nickel and added much to my stock of knowledge.

I wish to congratulate you on the vastly improved punctuation you now use over that of a few years ago, especially in compound words, such as "twenty four-inch guns," instead of "twenty four inch guns," which is meaningless. But your practice of tying an adverb to an adjective is useless, I think, as in "widely-separated ships," for the adverb cannot jump over the adjective, as might be the case of the first adjective in "three masted vessels," where three vessels are referred to. I see you do not always use a hyphen thus, for on page 130 you speak of an "exceedingly sharp grade." Correct. On page 132 Mr. Claudy says, "The camera could *only expose* one plate at a time." He never meant that. He tried to say, "The camera could expose *only one plate* at a time." Seldom indeed is the word *only* used in the right place. Even our best writers "only get it right once in a while," or "get it right *only once* in a while."

I see you use the monstrosity *anyone* for *anybody* or *any one*. Anyone, someone, and noone are fakes made by linotype pounders. I have yet to find a dictionary that sanctions their use. *Nobody*, *somebody*, and *anybody* are the right words.

Some speak of *hardwood* floors. Redwood and whitewood are definite, but *hardwood* does not exist. A hardwood floor may be made of oak, beech, elm, or any wood that is hard. Why do such misconceptions live so long?

Pardon these suggestions from an old proof-reader, once of your city. W. P. ROOT.

Medina, O.

A Rapid Transit Proposal.

To the Editor of the SCIENTIFIC AMERICAN:

I read with great interest your recent editorial on "The Stupendous Traffic of New York." From the figures there revealed, it is clear that immediate measures looking to the proper handling of this vast human multitude must be taken, or the future interests of the city are bound to suffer.

New York is a city of "skyscrapers." Why not a skyscraper rapid transit system?

My plan is this: Procure a right of way through blocks of buildings, back of course of the more costly blocks for reasons both of economy and aesthetics, and locate there your railway system. It might be a combination of the subway and the elevated systems, a combination admitting of a considerable degree of expansion. The right of way need not be wider than that necessary for a two-track system. Two or more stories of subway tracks could be constructed, and just as many stories of elevated tracks as the mechanical limitations of such structures will admit, which, when curves are reduced to a minimum, could easily be anywhere from six to twenty. Ferro-concrete construction could be largely used throughout, insuring a stable and not prohibitively costly structure. Elevators run by the service electric current would solve the problem of reaching the various track elevations. The high-speed express trains could use the subway, and the moderate speed local traffic could utilize the elevated structure.

Such a system would have many advantages: 1. Construction could largely be carried on without impeding traffic on any important thoroughfare, which is impossible under present methods to prevent or even to mitigate except at great cost. Open-trench construction, under this system, would be possible for the subways, while the elevated structure could be built without impeding traffic more than does the erection of an ordinary building. Such economies would go far toward defraying the additional expenses of the right of way. 2. For the greater portion of its length such a system would be out of sight from the streets, owing to its running through the block rather than along the streets. The portion that crosses the streets could be made more or less ornamental, and add to, rather than detract from, the æsthetic appearance of the city. 3. Abutting buildings could be so constructed as to assist in giving stability to the structure. 4. By the use of solid concrete floors the noise of the elevated railway would be largely obviated.

Such a system is mechanically, financially, practically, and æsthetically possible. No city but New York could build such a system, but no city but New York needs such a thing; this, or something like it, she must have and soon. J. LOGAN IRVIN.

Americus, Ga.

Evolution of the Flying Machine.

To the Editor of the SCIENTIFIC AMERICAN:

The principal difficulty now in flying machine construction is the inefficiency of present methods for insuring the stability of the structure when submitted to the air. We now have the proper type of machine clearly defined—either the Langley machine or Chanute's superposed planes; the requisite power in the light and efficient air-cooled gasoline motor, and clever mechanicians, as witness the marvelous development of the automobile. What then is most needed is some sure way of maintaining the equipoise constant under varying wind pressure without endangering the control of the machine, as is the case with the navigable balloon. Two methods are here presented, which I have designated as inherent stability and automatic stability—inherent when a balloon is used, automatic when generated at the instant of its adoption, as with the bird. What is termed automatic stability may be obtained by the use of some special electrical appliance or the gyroscope, probably the latter, supplemented by the former; and to make clear in just what way it is intended to use the balloon, so as to allow as large a margin of weight as possible, I quote an excerpt from an article of mine published several years ago: "The flying machine of the immediate future will have a balloon attached, it will have no appreciable lift, but will be used to impart that stability, so essential to success, and which is distinguished by its absence in the present-day contrivances." In my judgment it is not possible, for the present at least, to dispense entirely with a balloon; it is impractical to suppose that perfection can be attained in the first machine built, even though the principle is correct. With this as with everything else of importance, success will be largely a matter of evolution.

From experiments with small flying screws of various shapes, the data presented here has been deduced, and it may, I think, be accepted as axiomatic that a spoon shape, or a long blade of equal width throughout, and slightly concave, approximates closely the true form; that the maximum of efficiency is obtained by applying screws to the propulsion of an aeroplane; that the work or thrust of a propeller is considerably enhanced by placing just back of it on the same shaft a propeller of the same or preferably smaller dimensions; that a screw flying free is very uncertain and erratic in its action, precluding the possibility of ascent with any degree of safety. In a recent statement the learned editor of Collier's Weekly expresses a disbelief in even the ultimate possibility of flight, and no doubt this opinion is shared by many others, but the same thing was said of the automobile, or practically that, as recently as 1890-3. Despite the pessimistic views held by such prominent men, I am encouraged to think from a careful review of the whole subject, that in five or six years navigable balloons will be fairly common; and in ten years, allowing for the inevitable improvements, winged machines built of steel for the most part, possessed of tremendous power, and flying with astonishing velocity, will be the rule rather than the exception. The trend of all modern scientific thought points conclusively to such a consummation. The problem has been studied assiduously for centuries, but it is only recently that certain vital features have been perfected to such an extent as to place it among the possibilities. So well advanced is the subject, indeed, and so thorough and complete the knowledge necessary for the initial experiments that will lead to final conquest, that it now requires only the intervention of some modern Midas to wake it from its somnolence. J. C. PRESS.

South Norwalk, Conn.

Animal Magnetism.

To the Editor of the SCIENTIFIC AMERICAN:

Owing to the fact of America's inferior position in the scientific world, and that we have no honors to spare, I think it is here justifiable to comment on your article, "A Revival of Animal Magnetism," issued September 8, in which you end by saying that due to Dr. Otto Neustätter, of Munich, our native scientists have at last shown that "animal magnetism" is no longer a thing of mystery, but that it really exists; that it is an offspring of muscular excitement, and that it may affect the galvanometer. According to my experiments five years ago, I had found that that very subtle fluid, with which the living body and brain is always charged with more or less density, is really a ponderable emanation from the nerves; this I have clearly described in a series of articles in the American Inventor during the early months of the present year. I doubt very much if this static and ponderable charge would have electromotive force enough to deflect an ordinary galvanometer, although the currents which often can be induced to flow from the head toward the lower limbs by simple arm conduction are easily felt, as are also the physiological changes thus caused in the brain and the said lower limbs. Similarly can we note the effects of nerve emanation, as when absorbed by a very weak or sick person from one in rugged health.

My own experience has shown that under these circumstances the skin, while not in direct contact, may be scalded almost beyond endurance while the transference goes on; while the after effect for more than an hour is one serving to stimulate and steady the mind and general nervous system.

Plain frictional static electricity can never have after effects as cited, and hence the assertion that "animal magnetism" is a ponderable emanation. In 1825 Nobili showed that whenever a muscle is contracted, an impulse is set free, which has an E. M. F. strong enough to violently deflect the galvanometer; but it has been found by an American in 1901, long before our esteemed European contemporaries had thought of reviving the problem of "animal magnetism," that besides these spontaneous discharges from muscles, there are also similar ones from every nerve cell called into action. We long knew that after an impulse has passed through a nerve, it is left charged negatively; and now the beautiful fact is at hand, that bodies within the range of radium bombardment are also charged negatively. Recent experiments have shown that all warm-blooded animals are slightly radio-active, although, according to the more recent discoveries of Rutherford, we may have reasons to believe that, of the great quantities of emanation from living matter, only a few straggling rays have velocity enough to produce that electromotive force necessary to affect our clumsy instruments.

As there is a countless number of nerve cells in the brain, which are always more or less active, we may look to a charge of this emanation, which does not only saturate the brain, but the body as well, though to a lesser degree of density; and hence the difference of potential and transference by arm conduction as mentioned. ALBERT F. SHORE.

Brooklyn, N. Y.

The Current Supplement.

The current SUPPLEMENT, No. 1605, opens with a well-illustrated article on the new Rotterdam electrically-operated floating dock. Sanford E. Thompson writes authoritatively on the proportioning of concrete. The improvement of roads by oiling and tarring and by calcium chloride is discussed at length. Most important of all the articles in the current SUPPLEMENT is perhaps that by A. Frederick Collins on the design and construction of a 100-mile wireless telegraphy set. Such clear drawings illustrate the article, and the wording is so simple and full, that anyone ought to be able to make a very efficient wireless telegraph outfit by studying Mr. Collins's instructions. Mr. Swinburne contributes an excellent article on radiation from gas mantles. The splendid treatise on the modern manufacture of alcohol is concluded. In this installment the extraction of alcohol from the mash or fermented wort, as well as distilling apparatus and refining and rectifying apparatus, is described at length. Robert Grimshaw's article on the industrial application of gypsum is concluded. The English correspondent of the SCIENTIFIC AMERICAN tells how to improve telephony, basing his arguments on an ingenious apparatus devised by William Duddell. Instruments for the composition of simultaneous movements are described by Dr. Alfred Gradenwitz.