# Correspondence.

### Prevention of Street Noises.

To the Editor of the SCIENTIFIC AMERICAN:

Your article in this week's issue on "The Street Noise Crusade and the Rail Joint" is very good on this cause of unnecessary street noises. By far the most noise is produced, to my mind, by the wheels on the cobble stones. If flat rails about five inches wide to admit of the different width axles were laid, making two tracks in every stone-paved street, the loads would be drawn much easier and faster by the horses. The noise would be greatly lessened, and the nervous system of mankind thereby incalculably benefited. The animals' endurance would be enhanced and business much more quickly handled. The expense would be more than compensated in various ways.

FRED. BRADLEE ABBOT.

Sharon, Mass., September 4, 1908.

### Wreck of the White Mountain Express.

To the Editor of the SCIENTIFIC AMERICAN:

I read the above-named article in a recent issue of your valuable paper with much interest.

As you state, the train was hauled by a double-header. You give as a cause of the wreck the heavy lateral swaying motion of the electric locomotives that were hauling the train. I am of the same opinion so far, but furthermore believe that the main cause was the double-header. If a single engine had been used I don't think it would have occurred; and if it had been as heavy as both of those together, for a simple reason.

If the forward engine of a double-header strikes a depression, say in the left-hand rail, it will be thrown to the left, and after passing the place will sway to the right just in time to meet the second engine swaying to the left for the above reason. This will cause a heavy twisting motion upon the engine trucks, and tends to spread the rails, which it doubtless does when the locomotives weigh 95 tons and run nearly 60 miles an hour.

W. MITTENDORF.

New Braunfels, Tex.

### Absorption of Amido Bodies from the Soil.

To the Editor of the SCIENTIFIC AMERICAN:

I notice in the issue of SCIENTIFIC AMERICAN of August 15, 1908, page 111, an article in regard to the absorption of carbon from the soil, and especially the utilization of amido bodies. In this connection permit me to call your attention to the fact that in 1897 I published an article referring to the same subject. This article was published in Die Landwirtschaftlichen Versuchs-Stationen, vol. xlix, 1897, page 193, and in the Journal of the American Chemical Society, vol. xix, No. 8, August, 1897, page 605.

The complete data show that oats grown in soils rich in humus contain about 25 per cent more nitrogen than those which are grown upon ordinary agricultural soils, and that this increase in nitrogen is due directly to the absorption of amido bodies from the soil. Naturally, the whole of the amido body would be more or less completely utilized, and thus carbon as well as nitrogen would be assimilated by the plant therefrom.

J. W. WILEY.

Washington, D. C., September 10, 1908.

### Science, Enunciation, and the Schoolboy Mind.

To the Editor of the SCIENTIFIC AMERICAN:

In your issue of August 22 the article entitled "Science and the Schoolboy Mind" calls attention to the tendency of trusting to oral instruction in schools and the risks thereto. I would state that a great deal of the fault is not in oral instruction itself, but in the manner in which it is given. The tendency of the average teacher is to talk rapidly in explaining a lesson and, if I may say it, carelessly. This does not mean the use of improper grammatical English, but the improper enunciation thereof.

If, to quote the article, a pupil had heard the teacher say in a purely syllabic way the definition of the equator, the ridiculous interpretation of it as "a menagerie lion" would not and could not result.

In speaking syllabically the syllables are fully sounded, and a sufficient pause made between each, so as to prevent a blending together of the final and initial sounds. The length of this pause need not necessarily be more than a fraction of a second. Too much stress cannot be laid upon the matter of correct speech, the lack of which is the cause of the errors stated. Teachers should be instructed especially in the great importance of correct speech, and especially in the classroom. In fact, proper enunciation of speech should be a *sine qua non* in the examination of teachers.

In syllabic speech a misconception of a word is impossible to the pupil's mind, because each sound is clearly enunciated and time given for it to make the desired impression on the pupil's mind. In rapid unsyllabic speech, the words are transmitted from the teacher to the pupil in such a way that there is a confusion of sound, and a false impression is made upon the pupil's mind that can be removed only after a great deal of trouble. One can easily prove it by reading both the statement that "the equator is an imaginary line" and that "the equator is a menagerie lion" in a pure syllabic style; or better, read the statement both syllabically and unsyllabically. The difference will be such that no further proof is necessary. In fact, too great a stress cannot be laid upon this matter, which is so important and yet so utterly neglected.

GERALD ELLIS CRONIN.

Brooklyn, N. Y., August 30, 1908.

### Air Scouts and Artificial Fog.

To the Editor of the SCIENTIFIC AMERICAN:

A great deal is being said and written of late concerning the influence the airship will exercise on modern warfare. Heretofore strategy, the doing of things not expected by the enemy, the execution of secret movements for which he is not prepared, has been the very soul of military science. But with the advent of the "air scout," we are told, all this will be changed; every general will know just what his opponent is up to, the man with the big army will win.

It seems to me that this view of the matter overlooks some important possibilities. When the "air scout" becomes an accomplished fact, will not some inventive person devise an artificial fogmaker, a kind of bomb that will, in exploding, fill the air with smoke, so that the aerial spy will be foiled? Something of the sort will surely happen. A general about to execute a flank movement, or a concentration on some given point in the enemy's line, could make his preparations over night, and then, after having filled the upper air with smoke by means of balloons loaded with the smoke-producing mixture, deliver the blow as he designed it. And his foe would have no other way of ascertaining his intention than the good old method of observation and deduction.

In a recent story H. G. Wells depicts a fancied battle between a fleet of American battleships and a German air fleet, in which the Germans get the best of the fight by dropping bombs on top of the unlucky vessels. Now, the latest type of British cruiser, the "Indomitable," I understand, is without rigging. Why could a ship of war not be equipped with a bomb-proof, or at least a bomb-shedding, roof? This device would explode the deadly missile in the air, away from the vitals of the ship, and thus save her from destruction. Or perhaps the roof could assume the form of a network, which would be lighter, and would not catch the wind.

In fine, although the introduction of air scouts and bomb-dropping aeroplanes will complicate matters, I do not believe they will revolutionize warfare, as has been alleged. Possibility has always a few trumps up her capacious sleeve, which she can produce when needed.

SYDNEY C. HALEY.

Eustis, Fla., September 12, 1908.

### The Value of Inclined Propellers for Helicopters.

To the Editor of the SCIENTIFIC AMERICAN:

I desire through your columns to bring to the attention of aeronauts an experiment which may possibly throw a little light on the problem of aerial navigation by means of the helicopter type of machine.

Experiment shows that the simplest form of helicopter, the propeller with flat inclined planes, cannot exert sufficient lifting force to raise the weight of the engine with any additional weight. Although the efficiency of the helicopter can be very much increased by varying the shape of the planes, so far no form has been devised which gives any great promise of success.

The failure of the helicopter is due to the fact that a large proportion of the power of the engine is wasted in creating lateral air currents, which have no effect in raising the machine. That an engine can exert more than power enough to raise itself, if the power were effectively applied, has been demonstrated by Prof. Langley's inclined plane experiment, and Nature itself affords a demonstration in the flight of the bird, which, weight for weight, possesses only a small fraction of the energy of a well-constructed engine. The problem of flight by means of the helicopter is therefore as much a question of properly utilizing the power of the engine as of combining the greatest power with the smallest weight.

The experiment referred to, although performed with crude apparatus, illustrates this truth in a significant manner. Two propellers of equal size with flat inclined planes were revolved horizontally at the same rate of speed and their lifting force measured by a spring scale. The speed was then doubled and the lifting force again measured. It was found that the lifting force had only been increased by half. As the speed was still further increased, the proportionate increase in lifting power diminished, which indicated that as the speed increased the energy wasted in creating lateral currents increased. This is the secret of the failure of this form of helicopter.

The propellers were now inclined toward each other at an angle of about 35 deg. and revolved at the same rate of speed. It was found that at lower speeds the lifting power was about the same as in the horizontal position, but at higher speeds it was very much greater. The significant fact of the experiment is that, with the propellers inclined, the lifting force increased at a greater rate than the speed, while the reverse was the case with the propellers in a horizontal position. The reason for this is that the air currents created by each propeller impinge upon the blades of the other and thus, by mutually increasing the resistance they encounter, enable them to exert a greater lifting force. The angle at which the propellers should be inclined for the greatest efficiency would of course be the angle that gives the greatest upward component of force.

If the principle illustrated in the above experiment were more fully recognized in the construction of the helicopter type of machine, better results might be attained.

H. T. KEATING.

Columbus, Ohio, September 9, 1908.

### The New California Rifled Oil Pipe.

The $4,500,000 rifled pipe line spanning the 282 miles from Bakersfield to Port Costa with its relay pumping station every twenty-three miles, its sixty men on duty along the route and its flow of between 17,000 and 20,000 barrels of thick, heavy oil past a given point every twenty-four hours, is now in operation.

The construction of the pipe line was started just a year ago. The idea was the joint invention of John D. Isaacs, consulting engineer at Chicago of the Southern Pacific Company, and Buckner Speed.

The rifled pipe is a new scheme. It has been described at some length in the SCIENTIFIC AMERICAN. Into the interior surface of the pipe are cut corrugations about an eighth of an inch deep, and these run spirally round and round, making a complete circuit every ten feet. Into this rifled pipe from two separate engines are pumped nine parts of the heavy oil and one part of water. The water following the rifled indentures takes a swirling movement and forms a very thin sheet of lubricant about the oil, and the two move along together, the oil forming a dark central core that does not come into direct contact with the pipe. This avoids friction, which, with such oil, would prevent progress. It also saves the life of the pipe.

At each pumping station on this rifled-pipe line there are two 55,000-barrel oil tanks and one 10,000-barrel water tank. The flowing oil and its surrounding sheet of water are received into one of the big duplicate tanks and then the water is drained off from the bottom and again taken up by a duplicate water pump and shot into the big pipe into which oil is being sent from a duplicate oil pumping engine.

### Smokeless Fuel.

According to the Mechanical Engineer a London man has recently patented the following process for the manufacture of smokeless fuel: About one-third part by weight of wet peat and two-thirds part by weight of bituminous coal, which may be in a finely divided state, are taken and placed in a retort and heated to a temperature sufficiently high (about 850 deg. Fah.) to drive off those hydrocarbons that produce smoke, the generation of the steam from the peat assisting in this operation. It will be understood that the temperature is not raised materially higher than is necessary to drive off the hydrocarbons as stated. The heat is applied for about five hours. The bituminous coal binds the peat together to a coherent mass and forms a fuel of high calorific value, which is readily ignited in a grate in the ordinary way and burns economically and without smoke.

In practice the retort may be provided with relief valves and arranged so as to maintain a pressure of 10 pounds per square inch. The retort may be heated in any convenient way, such as by heat externally applied or by burning some of the gases generated after partial purification.

The watery extract, containing tar of complex constitution, pyroligneous acid, and other products derived from the carbonization of peat, in addition to the gases referred to, is advantageously condensed and utilized for the production of a pitch of superior quality, and the usual condensable products obtained from the bituminous coal in the retort may be collected and used for any desired purpose. In some cases the contents of the retort after the process has been completed may, while still hot or after they have cooled, be discharged into a solution of calcium chloride. By this means the smokeless fuel is rendered slightly deliquescent and always retains a certain quantity of moisture. The coal or the peat or both may be moistened with a solution of calcium chloride before being placed in the retort.

**Surface condensers require 1½ to 2 square feet of cooling surface per engine horse-power.**