Correspondence.

Registration Balloons.

To the Editor of the SCIENTIFIC AMERICAN:

In the issue of July 23, 1904, the article entitled "Registration Balloons in Italy," speaks of the use of these balloons for exploring the high atmosphere over Europe as a recent initiation. Although it is true that Italy has but lately co-operated, this work has been going on in France and Germany for several years. In the United States the Blue Hill Observatory alone has aided the investigation by kite flights made on a designated day every month, it being impossible, on account of proximity to the ocean, to employ balloons here.

Now, however, through the co-operation of the authorities of the St. Louis Exposition, an attempt will be made, under direction of the undersigned, to obtain the first data concerning the temperatures prevailing in the free air at great heights above the American continent. A. LAWRENCE ROTCH,

Director and American Member of the International Committee for Scientific Aeronautics.

Hyde Park, Mass., July 21, 1904.

Hay Fever.

To the Editor of the SCIENTIFIC AMERICAN:

I have read with some interest in your valuable publication an occasional article on hay fever and hay asthma, its cause and effect; and now that the season for this most distressing malady is fast approaching, feel that a word relating thereto will not be amiss. Having suffered from this distressing ailment for the past eighteen or twenty years I feel at liberty to express my views on the subject without offering an apology to the medical profession.

The generally accepted hypothesis, or consensus of opinion among the medical profession, so far as I can learn, is that the pollen from grass and various weeds, dust, and atmospheric conditions are the *causes* of hay fever and hay asthma. This, to my mind, is an egregious error, and can, possibly, be best refuted by presenting the matter in a hypothetical form. As some patients have hay fever and no asthma, we will first take up the question of hay fever. In order to disprove the generally accepted theory, let us suppose, for instance, that a person cuts his finger on some sharp instrument, and after a time a little salt gets in the cut. Now, while it is true that the salt will cause the wound to smart, or hurt, it must be admitted that the salt is not responsible for the cut. The cut is due to another and entirely different cause; and the salt only tends to irritate, or act as an irritant. So it is with hay fever. The diseased condition is already established, and it only takes the pollen from the various weeds, or dust, to produce the effect.

Now let us take the hay asthma condition. It is generally believed that the same *causes* which are supposed to be responsible for hay fever are also responsible for the hay-asthma condition—pollen of grass and weeds, dust, and atmospheric conditions.

This theory, to my mind, is also wrong; and until such time as we get on the right track, as it were, the chances of successfully combating these diseases are *nil*. If the pollen from grass and various weeds, dust, and atmospheric conditions are the *causes* of hay asthma, then why does not every one suffer alike from it? The fact is that these things merely act as an irritant, and are not the *cause* of the disease at all. There can be no more cogent proof that this is true than the fact that all do not suffer from it alike. Let us take, for instance, an asthmatic when he is entirely free from the disease, and let him eat a hearty meal of solid food. We must admit that the food he eats goes to his stomach; but where is the effect? The effect is in the lungs, tubes, or air cells. This is merely cited to show that while the effect is in the lungs or pulmonary organs, we must look elsewhere for the cause. The first thing to do, therefore, is to ascertain the true cause or causes of the ailment, when no doubt a sanative or sanatory remedy can be found with which to combat the disease.

I hold the opinion that hay fever, bronchitis, and hay asthma all spring from a common cause—catarrh. In fact, they are merely the different stages of catarrh. When we succeed in curing catarrh in all its forms, we will at the same time cure hay fever, bronchitis, and hay asthma. Hay fever is due to a diseased condition of the membraneous lining of the nose and throat, caused by catarrh, and which causes the linings of the nose and throat to become susceptible to the pollen of grass and weeds, and from dust, which act, as above stated, as an irritant.

The hay asthma condition is due to an exuberant production of mucus or phlegm, which obstructs the lungs and air passages and is caused by a catarrhal condition. If, therefore, we stop the unnatural production of this mucus or phlegm, we at the same time remove the deep-seated cause of the disease, and the result is freedom from hay fever and hay asthma.

Sewickley, Pa., July 23, 1904. S. F. BARRATT.

Electrical Notes.

The telegraph line from Vienna to Czernowitz is the longest line in Europe which uses the duplex system, being 630 miles long. The system was adopted a few months ago, as it was found necessary to increase the capacity of the line, which takes all the matter for Roumania, Southeastern Russia, and a part of Bulgaria. On account of the increase of traffic, especially during the summer, it was at first proposed to double the line, but this would have cost $60,000, while the duplex system which was adopted cost scarcely $1,000 to install. The system works well at present, although the line is constructed of iron wire instead of copper.

At the Iowa Electrical Association a discussion arose on the Nernst lamp in practice. The verdict was generally favorable; the deficiencies noticed were generally such as arose from circumstances inherent to electric lighting systems generally, and tended to show that the lamp is at present not possessed of sufficiently strong constitution to resist great changes of temperature. But briefly, it all amounted to the fact—already well known, for that matter—that the Nernst lamp cannot withstand any great increase of voltage for any considerable period, and that very close regulation is necessary. It is said that a filament will stand about the same variation of voltage as 3.1 watt incandescent lamp, which looks well. On the other hand, another speaker said that the cost of maintenance was about one quarter cent per kilowatt hour supplied to the lamp, and this looks heavy. Another speaker said that his main difficulty had been in connection with the burning out of the heaters, since the customer did not switch off the lamp when the filament burnt out. But a very short experience on the part of the consumer will rectify this, and it is satisfactory to be able to report that the lamp is making headway in the United States.

Prof. K. Birkeland has, according to the Elektroteknish Tidsskrift, Christiania, taken out patents for a process for obtaining electric arcs of very large surface. The invention is based on the production of a chemical compound or a decomposition of gas mixtures or gases by means of a special kind of electric arc. Electric arcs will exert chemical effects on gases, this effect being essentially dependent on the magnitude of the contact surface between the arc and gas mass. In order to augment this contact surface, the use of electrodes has been suggested, of such an arrangement and moving with respect to each other so as to expand the arc longitudinally, until the distance between the electrodes becomes too great. With this method exceedingly small currents were necessary. The process suggested by Birkeland consists in placing the point of contact between two conductors, one or both of which are susceptible of a vibrating movement, traversed by an electric current in a strong magnetic field. The inventor has found that under these circumstances an electric arc is formed between the contact points, even when the distance between the latter is increased only to a fraction of a millimeter, to be thrown violently upward or downward, so as to form a large plane permanent arc disk, capable of absorbing a great amount of electrical energy. This process seems to be specially available for producing nitrogen-oxygen compounds of air.

The Current Supplement.

A splendidly-illustrated and clearly-written article entitled "Portable Electric Drilling Machines" opens the current SUPPLEMENT, No. 1492. A new method for the conversion of peat into a fuel by electrical processes in such a manner as to be commercially valuable is described. Prof. Joseph W. Richards discusses in an interesting way the advance of electrochemistry. M. Emile Guarini continues his excellent account of the electro-metallurgy of iron and steel. The present installment of his article is fully illustrated by photographs of the apparatus described, as well as by clear diagrams. Dr. H. W. Wiley continues his summary of the borax experiments which he has conducted. The St. Louis correspondent of the SCIENTIFIC AMERICAN presents a very instructive account of the South at the World's Fair, illustrating his text with pictures of Southern State buildings. The Richard-Brasier car which won the Gordon-Bennett Cup is described. Besides these longer articles the SUPPLEMENT contains the usual assortment of interesting short paragraphs and the customary notes.

A Lackawanna Hudson River Tunnel.

It is definitely announced that the Lackawanna Railroad has decided to enter New York city by way of a tunnel bored beneath the Hudson River. The west mouth of the tunnel will be just east of the company's tunnel through Bergen Hill; this much at least seems certain. The Lackawanna's will be the third tunnel system to be built under the Hudson River.

There are 100 roads of one kind or another over the Pyrenees between France and Spain, but only three of these are passable for carriages.

Engineering Notes.

Hoisting engines may be said to be of two distinct types, viz., geared and first motion. Geared engines are used ordinarily where a hoisting speed of 800 feet or less is satisfactory, and first-motion engines where hoisting speeds of from 800 to 3,000 feet are required. The same load may be hoisted with the geared engines as with the first motion at a very much less cost for installation but at a sacrifice of speed. To hoist the same load the first-motion engines would necessarily have to be three or four times as large as the geared engines, the hoisting speed and cost increasing in about the same proportion. First-motion engines are now usually installed on all main hoisting shafts, although many geared engines are used on auxiliary shafts and slopes, particularly the latter, where it is desirable to haul heavier trips at a slower speed.—S. T. Nicholson in Mines and Minerals.

An electric traveling crane of exceptionally large size and capacity has lately been built by the Vulcan Company, of Stettin, for use on the construction docks, especially for transporting armor plate and heavy pieces of steel from the mills to the vessels in erection on the docks. The crane measures 175 feet long and 22 feet wide and is supported by two double pillars of steel trellis-work spaced 85 feet apart. The pillars each rest upon four wheels and run upon a track which passes over the whole length of the docks. Below the upper platform of the crane and inside the framework composing the cross-bridge, circulates the cabin or car of the crane proper, which is 6 feet wide and contains the motor-operated drums, which give the hoist and the lateral movement of the crane, besides the different electrical apparatus for the maneuver. Two motors are used to operate the crane. These are of the 3-phase type and work at 500 volts and 1,150 revolutions per minute, with capacities of 11 and 4 horse-power respectively. Gearing connects the motors with the drums. An overhead line runs along the track, and current is taken by a short-arm trolley which is fixed at the end of the bridge. The crane will lift 28 tons within the space of 85 feet between the pillars, but it has been tested as high as 40 tons.

The following is an interesting instance of the readiness of the Japanese Admiralty to profit by experience, and to lend a ready ear to the suggestions of private shipbuilders, even though it entails an abandonment of the plans of their own naval constructors. In 1888 a tender for the construction of a cruiser, the design of which they submitted, was asked from the Thames Iron Works and Shipbuilding Company, of London. Upon examination, the contractors found the design to be somewhat peculiar, and were reluctant to tender upon it. The risk to build according to the Japanese design was great, but to ignore it, and to tender upon their own substituted design, would have appeared a severe slight upon the Japanese naval constructor. After some consideration the contractors tendered upon the submitted design, but reserved the right to make any slight modifications in the plans, should their tender be accepted. The dimensions were as follows: Length between perpendiculars, 328 feet; breadth, 36 feet 6 inches; depth of hold, 19 feet 10 inches; draft of water, mean, 13 feet 6 inches; displacement, 2,133 tons; I. H. P., 6,000 forced draft for a speed of 19 knots. The order, however, was eventually placed in France, and the vessel foundered on her voyage out to Japan. When, therefore, the Japanese government placed their contracts for the "Fuji" and "Shikishima" some years later with this firm, they left the design entirely to the builders.

Owing to the high standard of efficiency to which the gasoline motor propelled boat has been developed, its utilization for naval purposes has been advocated. In a recent issue of the SCIENTIFIC AMERICAN SUPPLEMENT we published the report of a lecture upon the subject delivered by Mr. Thornycroft, the well-known English naval constructor, in London. The British Admiralty has now decided to create a class of motor torpedo boats upon the lines explained in the lecture. Each vessel is to be 130 feet in length, and will be armed with a deck torpedo tube, that can be trained all round, so that the weapon can be discharged in any direction. The motors will be placed below the waterline, and covered with a protective deck. The main advantage possessed by the motor torpedo boat over the steam-propelled vessel is the absence of smoke and funnels. This renders it more difficult of detection at night time, and also more effective for use in an attack under cover of darkness. If the experiments with this class of boat prove successful, the employment of gasoline motors in the torpedo picket-boats carried by battleships is also to be developed. The Admiralty will in all probability adopt the same type of gasoline motor as that in use upon the submarines, as this motor has proved highly efficient. There is one great objection to the employment of this type of motor, and that is the highly inflammable nature of the fuel. The penetration of the gasoline reservoir upon the boat by a shell would inevitably result in a conflagration, and the destruction of the boat.