Hay Fever.

At the present time there are probably nearly 50,000 people suffering from what is called hay fever.

When this affection was first recognized it was supposed that it depended upon the irritation produced by the pollen of certain flowers and grasses which floated in the air in the months of May, June, July, and August of each year.

Subsequently is was claimed that two distinct forms of the disease existed, and to one was given the name of "June cold," while the other received the name "autumnal catarrh."

Further observation revealed the fact that an affection characterized by symptoms essentially the same as those seen in connection with hay asthma, hay fever, June cold, rose cold, autumnal catarrh, etc., occurred in seasons of the year in which none of the supposed exciting causes of the hay fever could operate, and for some time the reasoning was that it must be some other disease than that produced by the pollen of plants. It was also observed that certain persons were peculiarly affected when brought in contact with certain animals, such as the cat, and by the vapor from certain animal substances, such as warm milk. These observations, and others of like character, have from time to time led to modifications of former opinions regarding the nature of hay fever, and, at last, have given rise to a theory which has been promulgated as one capable of explaining all the phenomena of the disease whenever and wherever occurring.

In this country two books have been written on hay fever: one—the oldest, and for a long time the only systematic monograph upon the subject—by Dr. Jeffries Wyman, of Boston; the other by Dr. Geo. M. Beard, of New York. In Dr. Beard's book we find the first open announcement of the theory to which we have already referred, namely, the "nerve theory." This theory is the result of the study of one hundred cases, and it is that hay fever is a neurosis. According to this theory, the disease is subjective instead of objective; external irritants, which are exceedingly numerous, such as rag weed pollen, etc., are of a secondary and a tertiary character and powerless in themselves to produce the disease, and produce the disease only when acting on a nervous idiosyncrasy.

This author has described a new form of the disease, which he calls the July cold, or middle form, which links the early form, or June cold, with the later form, or autumnal catarrh. It seems to us that the nerve theory explains many of the cases which have heretofore been regarded as very obscure; for example, those in which the symptoms peculiar to hay fever have continued from May to November, or during the winter months, or all the year round. If the nerve theory be true—and it seems to be fairly sustained—it revolutionizes the treatment of the disease. It must be attacked from a new point of view; yet it cannot be successfully claimed that all cases are to be treated alike, or that any specific can be found for it. The remedies to be employed are those which are not painful—not even disagreeable. Of course, removal from the exciting cause is the primary factor in obtaining prompt relief; but, when this cannot be effected, the symptoms can be greatly relieved, and many cases cured, by such remedies as arsenic, nux vomica, carbolic acid, belladonna, tonics and sedatives, electricity, etc., and their combinations.—*Medical Record.*

Typhoid Fever from Diseased Meat.

An epidemic of typhoid fever, interesting in its etiology, followed a musical festival at Zurich, in May, 1878. Out of some 700 assistants, 500 were attacked by the disease, of whom 100 died. The symptoms could not be mistaken, and the autopsies confirmed the diagnosis. A minute inquiry into the circumstances left but little doubt that the epidemic was due to the use of bad veal furnished by an innkeeper of the place. It may be claimed by those who attribute to general causes the power of originating specific diseases, that the typhoid fever was due to a septic poison present in the veal, depending possibly on a beginning fermentation, which was not destroyed by the cooking to which it had been submitted. On the other hand, as the animal from which the meat was taken was sick, it may be asked whether it might not have been suffering from typhoid fever, although this disease has never yet been recognized among animals. It is a remarkable fact that in 1839 a similar but much less fatal epidemic occurred in a neighboring locality. After a reunion that took place under similar circumstances, 440 persons were taken sick with all the symptoms of typhoid fever. It is probable that in this case also the meat of a sick calf gave rise to the disease.—*Journal de Médecine.*

Ammoniacal Sulphate of Copper in Neuralgia.

Dr. Féréol having found several times obstinate cases of neuralgia of the fifth nerve, tic-douloureux, which had resisted a variety of other means, rapidly and completely cured by the administration of ammoniacal sulphate of copper, reports to the Académie de Médecine on the subject (*La France Médicale*, April 5th). The first case is that of a strong man, aged thirty-two, who had suffered so atrociously from terrible neuralgic crisis that on some days he was scarcely free for a few minutes at a time. Six teeth had been vainly extracted, and anti-neuralgic medication exhausted. He then tried ammoniacal sulphate of copper. The amelioration was considerable on the first day; on the second, the patient slept all night for the first time in two months; and at the end of ten days he left the hospital cured. A second case of supra-orbital neuralgia in a strong young man, occurring every morning and ceasing at noon, had been vainly treated by leeching, blistering, and full doses of quinine. The ammoniacal sulphate of copper, given in a dose first of all of 0·10 and then 0·15 centigramme daily, produced an immediate amelioration of pain, and the patient described himself as cured. The medication was continued for a week, and the neuralgia did not return. Similar effects were obtained by M. Féréol in a lady, aged forty-three, delicate, nervous, but not hysterical, suffering from persistent right hemicrania, with atrocious pain in the fifth pair of nerves, which drove her almost wild, and for which she had vainly tried quinine, aconite, morphia, hypodermic injections, etc. Similar results were obtained in an old man, aged sixty, suffering for eighteen months from a horribly painful neuralgia, starting from the nasal branch of the fifth, and in whom local and general treatment by the oldest of anodynes and antiperiodics had been vainly tried. In this case the results were not permanent, the patient having an invincible dislike to the sense of nausea produced by the sulphate of copper. The formula employed is the following: Distilled water, 100 grammes; sirup of orange flower or peppermint, 30 grammes; ammoniacal sulphate of copper, 0·10 to 0·15 centigramme, to be taken in the course of twenty-four hours, especially during food, in order to avoid irritating the stomach. In one patient, the dose was raised to 60 centigrammes a day without any other inconvenience than slight gastric pain and a little diarrhea. The medium dose was 0·10 to 0·15 centigramme, which should be continued for from ten to fifteen days, even after the complete disappearance of the pains.—*London Medical Record.*

Late Views of the Age of the World.

Geologists, astronomers, and physicists alike have hitherto been baffled in their attempts to set up any satisfactory kind of chronometer which will approximately measure geological time, and thus give us some clew to the antiquity of our globe. It is therefore worth noting that Mr. Mellard Reade, of Liverpool, has lately contributed to the Royal Society a very suggestive paper, in which he endeavors to grapple with the question by employing the limestone rocks of the earth's crust as an index to geological time. Limestones have been in course of formation from the earliest known geological periods, but it would appear that the later found strata are more calcareous than the earlier, and that there has been a gradually progressive increase of calcareous matter. The very extensive deposition of carbonate of lime over wide areas of the ocean bottom at the present day is sufficiently attested by the recent soundings of the Challenger. According to the author's estimate, the sedimentary crust of the earth is at least one mile in average actual thickness, of which probably one-tenth consists of calcareous matter. In seeking the origin of this calcareous matter, it is assumed that the primitive rocks of the original crust were of the nature of granite or basaltic rocks. By the disintegration of such rocks, calcareous and other sedimentary deposits have been formed. The amount of lime salts in water which drain districts made up of granites and basalts is found, by a comparison of analyses, to be on an average about 3·73 parts in 100,000 parts of water. It is further assumed that the excessed areas of igneous rocks, taking an average throughout all geological time, will bear to the exposures of sedimentary rocks a ratio of about one to nine. From these and other data, Mr. Reade concludes that the elimination of the calcareous matter now found in all the sedimentary strata must have occupied at least 600,000,000 of years. This, therefore, represents the minimum age of the world. The author infers that the formation of the Laurentian, Cambrian, and Silurian strata must have occupied about 200,000,000 of years; the Old Red Sandstone, the Carboniferous, and the Poikilitic systems, another 200,000,000; and all the other strata, the remaining 200,000,000. Mr. Reade is, therefore, led to believe that geological time has been enormously in excess of the limits urged by certain physicists; that it has been ample to allow for all the changes which, on the hypothesis of evolution, have occurred in the organic world.—*London (Eng.) Academy.*

Engraving of Copper Rollers with Chromic Acid.

Copper printing rollers are engraved in two ways, only one of which is actually engraving proper, namely, the impression of the pattern by means of a steel die, a process which sometimes, as in the case of heavy furniture patterns, is supplemented by direct engraving with a graving tool by hand. The other plan frequently employed is etching, the substance of the copper being eaten away by the application of acids. This process gives very nice shading, and when judiciously employed is of much use.

Generally this method consists in covering the roller with a mastic or varnish, which protects the places which are not to be acted upon, and which leaves the pattern to be engraved open. The roller thus prepared is then plunged into a bath of nitric acid of 15° B., or stronger. Sometimes a little hydrochloric acid is added to favor the dissolving action of the acid. The operation generally takes not more than five or six minutes.

This process has grave inconveniences, especially in places where there is not a sufficiently strong ventilation to immediately carry off the fumes which are formed in large quantities. This free acid is not only dangerous for the workpeople, but, spreading in the room, soon affects the machines. There is also this drawback, that the acid acts underneath the varnish, resulting in unclean edges of the engraving.

A German chemist has for some time employed chromic acid in place of nitric acid, and from all accounts with very satisfactory results, especially in damp localities. The attack of this acid upon the metal is a little slower, but the engraving is sharper and clearer. The solution is the following: 5 oz. of commercial bichromate of potash are dissolved in 26 oz. hot water, after which 12 oz. sulphuric acid of 66° B. are carefully added, and the whole well mixed.

This bath gets brown by usage; if after a few days' use it becomes much so it must be thrown away. It is necessary, in order to obtain good results, to slightly heat the bath, which is done by placing the trough containing it into a bath of tepid water (?).

The cost of working with chromic acid is even cheaper than with nitric, and altogether it appears to have many qualities to recommend it to calico printers.

RECENT DECISIONS RELATING TO PATENTS, TRADE MARKS, ETC.

By the Commissioner of Patents.

GRAIN DRILLS.—BERLEW *vs.* BERLEW & SMITH.

1. In courts of law judgment may be rendered upon admissions and stipulations of parties to actions involving purely private rights, and acts whereby one party induces another to adopt a course which would result in his detriment, unless the representations and promises involved in such acts are made good, present safe grounds for judicial decisions; but the law grants patents to first and original inventors, not to those who are conceded or admitted by others to be first and original inventors in the face of proof that they are not such; and parties cannot, by admissions or by concessions, or by acts constituting estoppels, determine the grant of patents in defiance of the facts. Subject to the modifications necessarily resulting from these differences in the subjects of adjudication, the rules of equitable estoppel apply in the Patent Office as in the courts.

2. If one or two joint applicants could by his acts estop himself from denying that the other was a joint inventor, the Commissioner would not by such an estoppel be authorized to declare the other a joint inventor when the facts showed that he was not; but he might be authorized to protect the other from fraud by making him a joint patentee.

By the Acting Commissioner of Patents.

BAG FASTENER.—MCKENNA *vs.* REDDEN.

1. The applicant who conceived the idea of an invention in 1869, and from that time forward until 1876 simply had conversations about it and made one or two experimental models, then patented an invention of the same class, but of entirely different construction, held not to be the first and original inventor as against another who, although subsequent to conceive, had patented the invention in controversy, and put the same in extensive public practice a year before the former applicant had filed his application for a patent for the same invention.

2. It is a well settled doctrine that an inventor of a device must not only be the *first* inventor, but that he must also exercise diligence in reducing the same to practice in order to invalidate the title of a patentee, or to obtain a patent as against such a patentee, who, although subsequent to invent, was diligent in putting the invention before the public, while the one first to devise was making no effort to that end.

GLASS PATTERNS.—EX PARTE REES.

1. A mere change of material in the construction of a machine or an article, where the superiority attained is due alone to the nature of the material employed, unaccompanied by changes of adaptation, or useful results not before contemplated, is not invention.

2. A pattern made of glass, from which the vamps, quarters, and other parts of boots, shoes, etc., are cut, held patentable, in view of certain new and valuable results attained, notwithstanding the fact that such patterns had heretofore been made from paper, iron, brass-bound boards, etc.

A Caution about Shot in Game.

This being the season when game killed by shooting, and probably containing the pellets, is eaten, it may be worth while to caution those who consume the flesh of birds with avidity that the proportion of instances in which shot is found is probably small in comparison with the number of cases in which the pellets are unwittingly swallowed. It is a matter of speculation how much mischief a shot may do when passed into the intestines, but the fact that anomalous diseases have been set up by the presence of very small bodies which have become entangled in folds of the mucous membrane renders it desirable to put the public on their guard. Occasionally the most disastrous results have followed such small causes.

We have in recollection the case of a physician who died after prolonged and unexplained sufferings, from the impaction of a very small nail which had found its way into a pudding, and was inadvertently swallowed. A little care will avoid this contingency, but, remembering that the bird had been shot, some pains ought certainly to be taken to avoid swallowing the missile.—*Lancet.*

STEEL.—The production of steel effected by Great Britain last year was 807,527 tons. In the same year the United States made 732,226 tons of steel; Germany, 240,000 tons; France, 140,000 tons; Belgium, 75,000 tons; Sweden, 20,000 tons; and Austria, 25,000 tons. The aggregate steel production of the world was thus something over 2,000,000 tons last year.

Glass Railway Sleepers.

A new and somewhat singular material for railway and tramway sleepers has lately been introduced into England, this material being glass toughened by a process discovered by Mr. Frederick Siemens, of Dresden. Owing to Mr. Siemens' patents for the most recent improvements in his process not yet being completely secured, we must postpone for the present any details of the toughening process itself, but we may state that its effect appears to be to secure a product differing essentially from glass toughened by the well known process of M. De la Bastie, inasmuch as when broken it does not fly to pieces like glass treated by the last mentioned process, but merely fractures somewhat like cast iron.

The material used by Mr. Siemens for his sleepers is glass of the commonest kind moulded to any desired form. The sleepers are being introduced into this country by Mr. Hamilton Lindsay Bucknall, who has lately laid some of them on the line of the North Metropolitan Tramways at High street, Stratford. The sleepers in this case are of exactly the same section as the wooden longitudinal sleepers they have replaced, namely rectangular, 4 inches wide by 6 inches deep, the upper side being moulded so as to accurately fit the rails. They are laid in lengths of 3 feet, and to avoid the danger of settlement at the joints, bearing plates, 10 inches by 5 inches by 1⅛ inch, are placed at these points, these plates being also utilized for effecting the securing of the rails by a fastening which obviates the necessity of moulding any hole in the glass. We may add that samples of the sleepers above mentioned have been tested by Mr. Kircaldy, and their average breaking weight when resting on supports 30 inches apart has been found to be about five tons, this being probably about two thirds of the resistance which would be afforded by a good pine sleeper of similar dimensions. It must, however, be borne in mind that, whereas the timber would become depreciated by use, the glass promises to be practically indestructible by moisture, etc.

At the works of Mr. William Henderson, a plate of Mr. Siemens' toughened glass, 9 inches square by 1⅛ inch thick, embedded in gravel ballast 9 inches deep, and having on its top a wood packing ⅛ inch thick, and a piece of rail, was subjected to the action of a falling weight, the blows being delivered on the rail. The weight was 9 cwt., and blows were successively delivered by letting this weight fall from heights of 3 feet, 5 feet 6 inches, 7 feet, 10 feet, 12 feet 6 inches, 15 feet, 17 feet 6 inches, and 20 feet. Under the last mentioned blow the rail broke, the glass, however, being uninjured. As a higher fall could not be obtained, and a greater weight was not available, a smaller section of rail was substituted for that previously employed, and the glass was broken by a second blow of the 9 cwt. falling 20 feet, the plate being driven through the ballast into the hard ground. A cast iron plate, 9 inches square and ½ inch thick, tested in a similar way, broke with a blow from the 9 cwt. weight dropped 10 feet.

The cost of the toughened glass is stated to be about the same per ton as that of cast iron, but as its specific gravity is only about one third that of iron, the cost of any article of given dimensions is of course materially less. The material has as yet been too recently introduced, and too little is known of its characteristics, to enable any very decided opinion to be formed as to its future capabilities; but the results of the experiments so far made with the material are certainly of an exceedingly promising character, and the further development of its application will be watched with much interest.—*Engineering.*

Refrigerated Storehouses.

A large six story building, belonging to the Massachusetts Chemical Refrigerating Company, located on North street, Boston, has been fitted up with machinery for generating and distributing cold air, and compartments for the storage of provisions. Ammonia is employed as a chemical agent to produce cold air, the same as is used in the ice-making machines of the South. After the storehouse has been rendered as nearly as possible impervious to outside atmospheric changes, the heat and gases are drawn off from the interior by a powerful exhaust fan, condensed, purified, and returned to do the work of refrigeration. By this continuous process the air is undergoing constant renovation, and is pure, cold, and dry to an extent not attained by other methods of refrigeration. The building referred to contains 94,000 cubic feet, of which 80,000 feet are now occupied by no less than 10,000 packages of butter, 300 barrels of beef, 650 cases of pork, 3,500 dozen eggs, 7,800 lb. evaporated apples, and about two tons of cheese, the property of different produce and commission houses. Similar refrigerators may be soon erected at several mercantile centers, and a line of steamers be fitted up to connect with trains of cars which shall all be similarly furnished.—*American Manufacturer and Exporter.*

Moral and Mental Effects Produced by Foods.

Dr. Bock, of Leipsic, writes on the effect of food and drink:

"Beer is brutalizing, wine impassions, whisky infuriates, but eventually unmans. Alcoholic drinks, combined with a flesh and fat diet, totally subjugate the moral man, unless their influence be counteracted by violent exercise. But with sedentary habits they produce those unhappy flesh sponges which may be studied in metropolitan bachelor halls, but better yet in wealthy convents. The soul that may still linger in a fat Austrian abbot is functional to his body only as salt is to pork—in preventing imminent putrefaction."

FIRE SCREEN.

The accompanying illustration represents a charming piece of work designed and executed under the auspices of the Royal School of Art Needlework, in London. The

FIRE SCREEN—ROYAL SCHOOL OF ART NEEDLEWORK.

design was doubtless made by one of the artists employed by that institution, after which it was embroidered upon the cloth and mounted as we see it here. A fourth panel, concealed from view in the illustration, but similar in character to the one on the right, completes the harmony of the design, which is in every way admirable.

Terrestrial Magnetism and Electricity.

Professors Ayrton and Perry, of the College of Engineering, Tokio, Japan, communicate to the *Philosophical Magazine* a short note, proposing the hypothesis that the phenomena of earth currents, terrestrial magnetism, and atmospheric electricity are due to the fact that the earth is an electrified condenser, whose capacity or potential is continually changing on account of its rotation and its annual orbital motion, the successive cooling and warming of the air, the formation of clouds and rain, etc., etc. These changes produce electric currents tending always to restore the equilibrium, whence follow the phenomena in question. They suggest that observations of atmospheric electricity may be used to predict atmospheric changes.

William Leroy Broun describes, in *Nature*, a new lecture experiment, to show the action of terrestrial magnetism. A rectangular frame of light wood, carrying twenty coils of insulated wire, was suspended in a horizontal position from the pans of a balance, so that the long sides of the rectangle were at right angles to the beam; and mercury connections were arranged at the middle of the short sides, so that a current could be sent through the wire. This apparatus being placed with the long sides of the rectangle perpendicular to the magnetic meridian, when the battery current passed from east to west on the northern side, and from west to east on the southern side, the north side would be attracted, and the south side repelled by the earth currents, both influences combining to deflect the beam of the balance. On reversing the current the deflection was in the opposite direction.

The Simplon Tunnel.

Our French neighbors, recognizing the vast importance of the proposed Simplon tunnel to their commerce, have, during the last few months, been in negotiation with the Swiss Government, and a treaty similar to the one which was concluded in 1871 between Germany, Switzerland, and Italy concerning the St. Gothard tunnel, will shortly be signed, by which permission will be granted to the French Government to subsidize the Simplon Railway Company to the amount of some 48,000,000 francs. M. Léon Say, the French Minister of Finance, arrived at Vevay on August 16 to make a personal inspection of the site of the tunnel and of the works which have already been carried out, in order that he may possess full *connaissance de cause* in recommending his government to grant the subsidy in question. The works alluded to consist of a line of railway lately completed and opened to traffic, which extends from Lausanne up the Rhone Valley to Brigue, at the foot of the Simplon—the very spot where it is proposed to pierce the tunnel.

On the other side of the mountain the Italian Government is engaged in constructing, at the cost of 28,000,000 francs, a line of railway which will unite Iselle at the southern end of the tunnel with Arona on the Lake Maggiore, the present northern terminus of the Haute Italie railways. The Simplon Railway Company are now, therefore, about to commence the tunnel, which, when terminated, will complete the straight line of railway extending from Paris to Brindisi, *via* Pontarlier, Lausanne, the Simplon, and Milan, thus obviating the immense angle described by the Mont Cenis route. It may be remembered that the proposal to subsidize the Simplon route was already submitted to the French Chambers in 1873, when it was indefinitely postponed without discussion. This want of proper consideration must be attributed to several reasons. In the first place, the resignation of M. Thiers and other political events absorbed men's minds in France at that moment; secondly, the Compagnie de la Ligne d'Italie, in whose favor the concession had originally been granted, had just failed in an exceedingly discreditable manner, and had been wound up by order of the Swiss Government. Lastly, at that time, when the prospect of completing the St. Gothard tunnel was apparently hopeless, the Simplon route not only seemed to offer no very special advantages to French commerce, but even appeared in the light of a competitor with the Corniche and Mont Cenis Railways, nor were the Paris-Lyon-Mediterranée Railway Company in favor of the undertaking. Now, however, the aspect of affairs has entirely changed. Since 1874 a new company has been intrusted with the execution of the enterprise, and has given most satisfactory proofs of its activity by the completion of the railway up to the very entrance of the proposed tunnel at Brigue. Colonel Cérésole, formerly president of the Swiss Confederation, is the leading spirit and managing director of this company, and is encouraged in his work by the earnest support of such men as Gambetta, Grévy, Léon Say, etc.

Although the tunnel will be rather longer than that of the Mont Cenis or of the St. Gothard, it will be constructed and worked under very much more favorable conditions than either of them. The entrances to the St. Gothard and Mont Cenis tunnels are both situated at a considerable altitude—the former being at 1,152 meters, and the latter at 1,560 meters above the level of the sea. Consequently, costly zigzag and corkscrew lines of access have been resorted to in order to reach the entrance of the tunnels, and owing to the very steep gradients, the power of traction required is something enormous. The Simplon tunnel, on the other hand, enters the mountain at its very base. The railway extending from Lausanne up the lower part of the Rhone Valley, is perfectly straight and without any curves, while the gradient nowhere exceeds 10 millimeters—1 in 100. At its exit on the southern side of the mountain, in the Diviera