tween the Petchora and the Obi, under the auspices of Sibiriakoff and others, through the northern Urals. There are, it appears, several passes, the best probably that of Shokurinsk. This is ninety-eight miles long, and extends from Kurga on the Petchora, a town accessible by steamers, to the Sigva River, an affluent of the Sosva of the Obi basin. The pass is only 1,450 feet above the level of the sea, and 1,150 above the Sigva. A railway a hundred miles long will therefore connect these two great water systems, and avoid all the perils of arctic navigation in the Kara Sea and Gulf of Obi. Another pass, the Voikarski, is of about the same length, but rises two hundred feet higher.

Partition of Patagonia. — Patagonia has disappeared from political geography. The Panama *Star and herald* announces the result of the agreement, in regard to this region, by Chili and the Argentine Republic, who have absorbed it. To Chili has been assigned all the western slope of the Cordillera to the southern extreme of the continent, to the Strait of Magellan, and all the islands off that coast. The eastern slope of the range, and the vast pampas extending to the Atlantic, are now the property of the Argentine Confederation. The Strait of Magellan is declared neutral, and free to all nations. The chief island of Tierra del Fuego is parted equally between the two nations, Chili taking all the other islands, including that of Cape Horn.

Miscellaneous. — It is announced that news has been received from Ghardaia, in the Sahara, of the assassination of Lieutenant Palat the explorer. He was murdered by his Mohammedan guides two days after leaving Insalah. It is alleged that his death was due to the Senousian fraternity, the fanatical association, whose members were the assassins of Colonel Flatter's party in the same region, and are held responsible for the death of numerous other explorers. Baron Kaulbars, after nine years' labor, has finished a new chart of South America. It is published by Iliin of St. Petersburg, in eight sheets, and on a scale of 1 : 6,300,000. The author is now engaged on a chart of Africa, to have the same scale. It is said, that, after the fixing of the frontier line by the Russo-English commission, many of the Turkomans living on the fertile slopes of the Afghan mountains have moved to the Russian side of the line. As the country on this side is a desert, it is supposed that they cherish the idea that they will hereafter have an opportunity of raiding the Afghan settlements from Russian territory, — a course which would be likely, if not energetically repressed by Russia, to raise anew many international complications. Lieutenants Ryder and Bloch of the Danish navy will devote this summer to hydrographic explorations in the district of Upernavik, Danish Greenland.

PARIS LETTER.

SINCE my last letter, a good deal of stir has been created in some circles by the death of three of the Russians sent to Pasteur, after having been bitten by a mad wolf. As is always the case, some persons cannot believe in methods that are liable to miss fire now and then : they think that medicine and physiology ought to be as precise and unvarying as mathematics ; they cannot understand that he who operates on living matter, operates on the most moving and varying of all grounds. No person of scientific training will wonder if Pasteur does not always meet with success : in fact, the experiment has only just begun, and we shall have to wait some time before a legitimate conclusion may be reached. I do not suppose that the fiery attacks of Rochefort, the renowned — and sadly renowned — pamphleteer, on Pasteur's experiments, are even able to attract the great experimenter's attention. They are good enough to amuse a few, but that is all.

However, as many newspapers have seemed rather dismayed by the death of the three Russians, and as some persons have seemed to be shaken in their confidence, M. Pasteur has deemed it advisable, at the meeting of the Academy of sciences, on the 12th of April, to give his opinion on the question. In his last paper, then, he begins by recapitulating the whole number of persons attended to by himself. At present this number is 688, of which more than half have outlived the more dangerous period, — that during which rabies is most likely to develop. Turning then to the question of the great danger of rabies communicated by wolves, he quotes many documents referring to the same, showing that recovery is very rarely met with. In Russia it is generally considered that persons bitten by rabid wolves have no chance of escaping their fate ; and it must be noticed, as M. Pasteur remarks, that in such cases the duration of the period of incubation is remarkably short. But the fatal effects of the wolf's bite is not due, according to Pasteur, to any increase of rabid virulence in the wolf. The virus is not, or at least does not seem to be, any stronger in the wolf than in the dog ; but as the wolf usually inflicts very severe bites, especially on the face and hands, the virus penetrates the body with much more ease. Such is, in Pasteur's opinion, the reason of the seriousness of rabies communicated by wolves. This opinion has led him to alter somewhat his method in cases where rabies is of wolfish origin : he is to tell us some day how he has altered it, and with what success.

Professor Vulpian, the eminent physiologist, has been recently elected *secrétaire perpétuel* to the Academy of sciences, in the place of Jamin. The election was a close contest. M. Henri Milne-Edwards was the other competitor, and the museum backed him solidly; but it was of no use: the son does not possess the influences the father exerted. It must be said also, that, from a general scientific point of view, Vulpian is far superior to his opponent as an original investigator and as a man of great culture. M. H. Milne-Edwards's works are rather few, while those of Vulpian are numerous and widely known. Among his principal contributions, we shall recall the following: 'Leçons sur la physiologie du système nerveux;' 'Leçons sur les vaso-moteurs;' 'Leçons sur les substances toxiques et médicamenteuses;' 'Leçons sur les maladies de la moelle.' Vulpian is a very kind-hearted and most excellent man. He is much loved by all the students, and is a man of high character. His whole life has been devoted to science, and, although a physician, he has never sought to extend his practice. It must be remembered, however, that he has been called upon to give his medical advice concerning two illustrious patients, — Count of Chambord, and Victor Hugo. It is generally believed that M. Brown-Sequard — well known in America — will be elected a member of the academy in Vulpian's seat, since it is the custom for the *secrétaires perpétuels* to resign from the section to which they were elected.

At the meeting in which Vulpian was elected secretary, M. Bouchard, professor in the medical school, read an interesting paper on the toxicity of urine during sleep and during waking hours. At the close of day this liquid is rather inoffensive; but, as sleep comes on, it grows more and more toxic: eight hours after waking, it is the most toxic possible. The symptoms of urine-poisoning are different with night and day urine. In the second case the symptoms are similar to those brought on by narcotics: in the first they resemble those provoked by convulsing poisons. Upon the whole, then, day urine tends to bring on sleep; and night, to awaken the sleeper. Professor Bouchard's paper is a very interesting one, and we have no doubt as to his obtaining very important results by continuing these experiments.

At the Académie de médecine, M. Marc Sée, at a recent meeting, read an interesting paper on the surface of the pulmonary vesicles. It is known, that, according to Küss, this surface is some two hundred square metres. M. Sée does not think that it is so great, but he still believes that it is equal to 130 or 135 square metres; that is, about ninety times the skin-surface. As it is, this surface is something enormous.

You may have heard some time ago of a very sad accident that happened in a mining-district near Périgueux, in the south of France. A sort of avalanche of rocks and earth buried a large number of workmen, and it was hoped for many days that they would be saved, because they might have taken refuge in caves in the hill when the avalanche occurred. In fact, it is certain that the unfortunate men were not — all, at least — killed by the accident. After every thing had been done to rescue them, and it was found impossible, owing to the immense quantity of materials to be bored through, a long hole was bored down directly to the caves, large enough to admit of the passing of provisions and tools. As nothing was heard, an effort was made to see what was going on within. An engineer and a photographer then devised a very ingenious plan. They sent down into the hole an electric lamp strong enough to illuminate the whole cave, and after that a photographic apparatus. The plate, after some time of exposure in the cave, came up, sure enough, perfectly impressed. But it revealed a ghastly scene. One of the bodies of the men — quite recognizable by the miners — was lying near the apparatus, and evidently had not long been dead. Near and around him pieces of other bodies were to be seen, and they were so disposed as to make it probable they had been torn from some corpse by the survivors. There is no reason, after the photographs, to suppose that these bodies were mangled by the accident, as they were quite *à l'abri* of the avalanche itself; at least, if they had been so mangled, these fragments could not have come naturally, or have been brought to the place where they were, unless by the survivors. This shocking tragedy has created a great excitement among the miners, who are convinced, that, if more haste had been made, some of the victims might have been saved. At all events, the idea of MM. Siemens and Langlois — the engineer and photographer — has proved a very ingenious one, and one that may be resorted to in similar cases.

The Gheel colony is certainly well known on the other side of the Atlantic. It is a colony for lunatics, where the no-restraint system is the only one used. The insane, instead of being shut up in cells or asylums, are committed to the care of the inhabitants of the country with whom they live, as would sane persons, for a very modest payment. This system is a very old one, and Gheel is unique in the world; the inhabitants being trained to keeping the insane, and living with them, for many centuries. However old, the system seems to be very good, at least for a large proportion of insane who do not require to be shut up, and to whom life in the open air seems to be

very beneficial. The Belgian government has decided to try and create a second Gheel, and has chosen Lierneux, wishing to have a Gheel where French is spoken, for the benefit of the part of Belgium where French is the only language understood, as Gheel is in the Walloon part of that country, and is very inconvenient for French-speaking insane. This plan seems to meet with success, and Lierneux is already provided with a number of patients, and with a committee for inspection and surveillance. We hope that Lierneux will thrive as well as Gheel has and does. I visited Gheel two years ago, and convinced myself that the insane are under happier and in healthier conditions than in asylums, and that if they are well looked after by the authorities, they are as well nursed and cared for. I may add, that, when a system has outlived some centuries, there must be some good in it.

A Parisian physician, Dr. Sandras, created some time ago quite a sensation in the medical world by a paper on the possibility of modifying the human voice to an unprecedented extent by the use of different inhalations, bringing to the larynx air saturated with different vapors. His opinion is based exclusively on experimental tests, not at all on theoretical views. Dr. Sandras pretends to be able to change the nature, intensity, pitch, and extent of the voice in quite a surprising manner. For instance, after ten or twelve inspirations of alcoholic vapors, the voice becomes quite hoarse, and cannot give more than five or six different notes. Inhalations with Guyot's *eau de Goudron* enfeeble the voice; on the contrary, *eau de Botot* strengthens the voice in a very marked manner; and with some essences — Dr. Sandras does not say which — this strengthening is so very great that the voice acquires new notes, high as well as low. Other substances confer only low notes; and others, only high ones. If the facts discovered by Dr. Sandras prove to be true for other persons than himself, this discovery will be very useful to singers, preachers, lawyers, and all persons generally that are obliged to use their voice a great deal. If it is also true that hoarseness of the voice brought on by cold can be cured in a few minutes, I do not doubt that the method will be much appealed to. For singers, certainly, the possibility of increasing the number of notes of the voice, either in the upper or in the lower or in both keys, will be much appreciated. Experiments with Dr. Sandras's method are to be made in the Conservatoire de musique.

The second number of the *Archives slaves de biologie* contains many interesting papers. One of them is by Professor Anrep, on ptomaines. The author has witnessed many cases of poisoning by preserved fish (sturgeon) in Russia, and has been able to isolate and extract the poisonous substance by the Stass-Otto method. The ptomaines so obtained are very toxic; and the symptoms brought on in animals very much resemble those of the principal depressing and paralyzing poisons.

Prof. A. Gautier has recently published an account of his experiments and researches on ptomaines and leucomaines. The facts he has discovered are very interesting indeed, and he has opened new ways in chemistry and physiology. The first leucomaine discovered was creatinin, found by Liebig and Petenkofer in 1849. Since then, M. Gautier, in 1881, following researches begun by his pupil, G. Pouchet, and beginning new experiments of an entirely different order, has been able to isolate many leucomaines very analogous to ptomaines, but quite different in that they develop only in living organisms. Leucomaines are found abundantly in the muscles: they are of many sorts. Xantocréatinine, crusocréatinine, amphicréatine, pseudoxanthine, are the most important. As to the manner in which these leucomaines originate, Professor Gautier cannot say, but he believes that the oxygen brought into the organism is the most efficient agent in the destruction of these poisons. They all oxidize very easily. Of course, if, for some reason or other, oxygen is less abundant in the blood (anaemia, chlorosis, etc.), leucomaines may become very abundant, and exert a toxical influence on the organism. Professor Gautier's experiments are very interesting from a physiological point of view: they may also become a standpoint for very useful pathological applications, because it is very natural to suppose, that, if leucomaines are able to originate and accumulate in a certain quantity in the organism, they must surely, in some cases, represent the origin of sundry diseases, or at least certain symptoms, hitherto unexplained or misinterpreted.

Yesterday evening, the Stanley club, which comprises the leading members of the Anglo-American colony in Paris, gave a dinner at the Continental hotel in honor of Pasteur. M. MacLane presided, and at the end of the dinner proposed a very appropriate toast to Pasteur, concluding as follows: "The United States, represented by the Stanley club, give you greeting, sir, as one of the most illustrious of those *esprits d'élite*, and, while proposing your health, I express, on America's behalf, the hope that your career, already filled up with so many great works, shall be yet a durable one, for the joy of those who suffer, and for the instruction of those who learn by your example how disease may be overpowered by labor and science." M. Pasteur answered M. MacLane, giv-

ing interesting details of his work, and also of his own character and temper. The passage is worth while quoting: "There are two men in me, — the one, timid, self-defiant, and of *humeur facile*, who accepts thankfully good advices and discussion; the other is a great deal less easy to manage. When, after having thoroughly used all the resources of experimental science, I am quite sure of having attained to truth, a second man arises in myself, absolute, very harsh in discussion, and of *humeur farouche*. . . . I am no more in November, 1885, timid, troubled, sleepless, always haunted by the nightmare of rabies. We are in April, 1886. Having called to aid all the resources of experimental science, I am now in possession of the exact scientific truth concerning this question." M. Pasteur concluded in proposing the joint health of America and France, "two nations formerly sisters on the battle-ground." Toasts were next proposed by M. de Blowitz and de Lesseps, and the meeting broke up after mutual expressions of sympathy and good feeling had been freely exchanged. H. V.

Paris, April 15.

NOTES AND NEWS.

A STRANGE nuisance of rats has developed itself in some parts of New York City, reaching such an extent as to call for an examination of the circumstances by the proper city authorities, and making dwellings almost uninhabitable. These animals are known to possess a remarkable migratory instinct, congregating in large numbers, and overrunning whole regions, to afterward as suddenly and strangely disappear. Dr. Buckland relates instances of their migration from house to house at certain times of the year, influenced probably by the lack or abundance of food. In a certain part of Berkshire, England, there were situated a number of isolated barns on the bleak, barren downs; and the rats were frequently met in colonies at early morning, marching in long lines direct from one barn to another. They were watched, and seen to go directly across the country in a straight line; and the most curious part about the circumstances was the instinct that told them where to go, or to find those barns which contained grain. At Central park there is no unusual number, though they find in spring plenty of food along the lakes in the grain fed to the swans and other aquatic birds. This grain is placed in boxes at some little distance from the water's margin, but the rats are not thus hindered from purloining it: they swim to the boxes, extract the grain, and then swim with it back to the shores. In the winter they collect about the animal houses. In the Philadelphia zoölogical gardens they have been very numerous, and not a little of a nuisance.

— Mr. Charles Rhodes of Oswego, N.Y., has lately published a circular giving the monthly and annual levels of Lake Ontario at Oswego for a number of years, as determined by records of the army engineers. The variations of level seem to be irregular, and are not well explained. For example, in April, 1873, after eighteen months of low water, the lake rose about two feet and a half in twenty days. When it is considered that the whole inflow of the Niagara during that time would scarcely more than produce the rise, even if the escape by the St. Lawrence were stopped meanwhile, the magnitude of the change may be appreciated, but can hardly be well accounted for. Mr. Rhodes also gives account, in a personal letter, of oscillations in the water of the lake that seem to correspond to the *seiches* of Lake Geneva and other Swiss lakes. He describes sudden flows of the water from Lake Ontario into the Oswego River, with a rise of ten to eighteen inches, followed, in half an hour or so, by an equally sudden discharge and fall, going as much below the ordinary level as the rise had been above it. Smaller oscillations succeed, gradually fading away. All such large and sudden fluctuations are followed by storms of wind, rain, or both. These singular phenomena, so well studied out by Forel in Switzerland, have received but little attention in this country. The records of lake-levels kept by the army engineers would probably afford many examples that should receive investigation.

— At one of the recent sessions of the Prussian Landstag, it was stated that the rigorous laws adopted in 1880, relating to rabid animals, had produced most excellent results. These laws impress the necessity of veterinary examination of all animals suspected of rabies, and if, in any case, the presence of the disease is determined, require that all animals which have been exposed to danger shall be immediately killed. Furthermore, in any district where a rabid cat or dog is seen, it is ordered that all dogs shall be confined or muzzled. As a result of these laws, there has been a steady decrease in the number of mad dogs. In 1880–81, 672 rabid dogs were killed; in 1881–82, 532; in 1882–83, 431; in 1883–84, 350; in 1884–85, 352. During the first of these years (1881–82) 2,400 other dogs, which had been exposed to the danger of contagion, were killed; in 1884–85 the number was 1,400. The number of human deaths has decreased in the same ratio: thus in 1880–81 there were ten; in 1881–82, six; in 1882–83, four; in 1883–84, one; and in 1884–85, none.