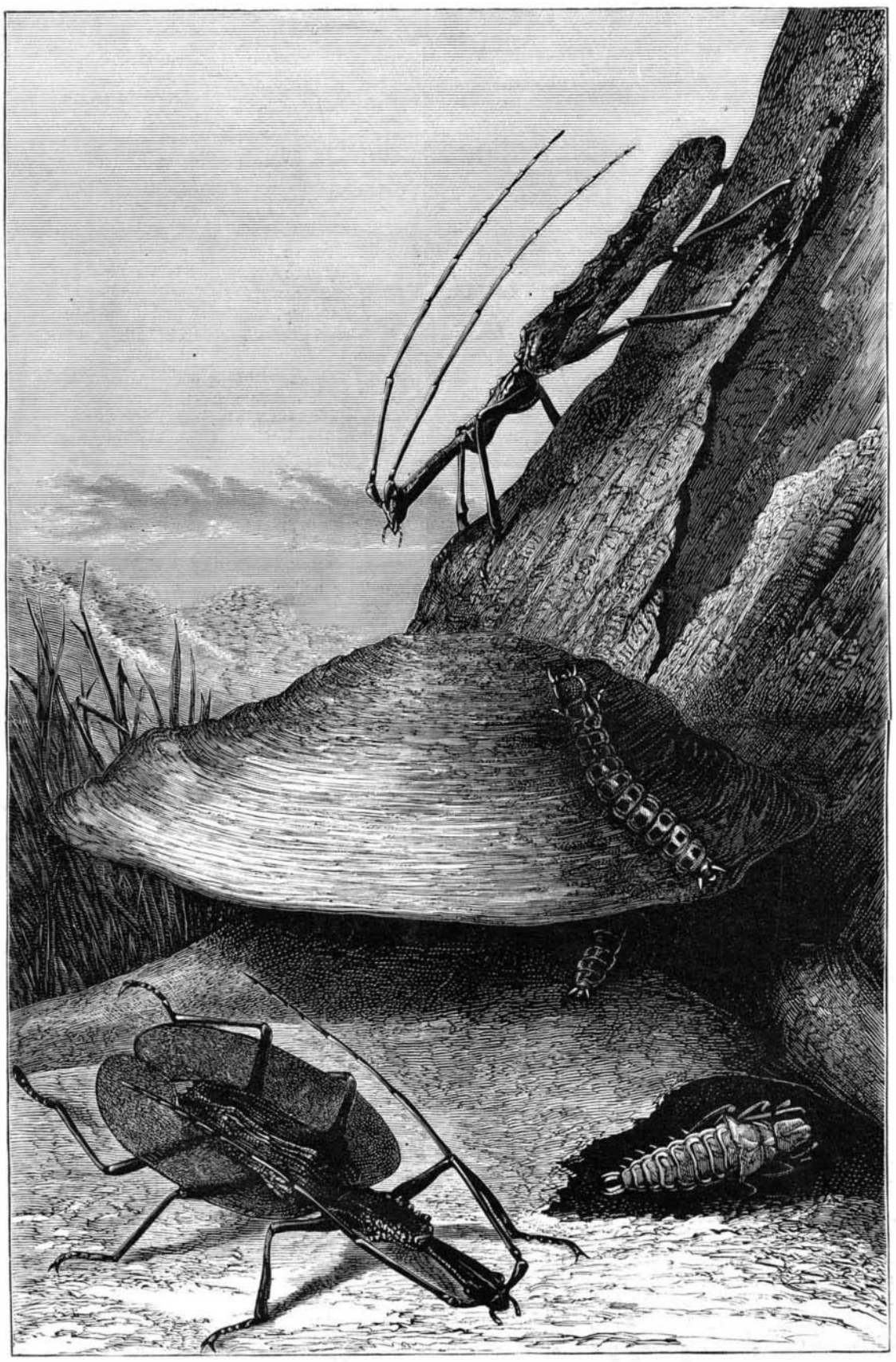
into the back yard of the James House, and pointed directly for the kitchen of the hotel, where several girls were at work. Fortunately, something turned the flying iron a few inches from its course, and it came in contact with a stone wall. This separated the rails into two parts. One was hurled a hundred feet into an adjoining garden, where it plowed up the ground for a long distance and was brought to a stop. The other portion leaped into the air and struck a chimney on the kitchen of the hotel. From there it was thrown to the roof of a three-story house some distance away, where it tore off the shingles for twenty feet and struck a high chimney, which it partially wrecked. Its force was then spent, and the iron, a section fifty feet long, rested in the midst of the ruin it had wrought. The rest of the railroad on the hill will be taken up in the old-fashioned way.

THE LEAF MORMOLYCE.

This insect, which is found on the Island of Java, has all its members well developed. The outer wings are especially developed in the horizontal plane, and give the insect a most singular appearance. The head is connected with a disk-shaped prothorax having serrated edges. The eyes are large and prominent, and the antennæ almost as long as the insect. The outer wings are covered with longitudinal flutings crossed by a number of transverse ridges. The inhabitants call the insect the "violin," on account of its resemblance to form of that instrument. The insect is not very well known in Europe, the first being brought thither in 1820 by Messrs. Kuhl and Hasselt. The annexed engraving, which we take from *La Nature*, represents the larvæ and the insect in full size.



THE METAMORPHOSES OF THE LEAF MORMOLYCE OF JAVA.—(*Natural size.*)

Coal.

Professor T. Rupert Jones, F.R.S., lately delivered a course of three lectures at the Royal Institution, London, giving a detailed account of the organic remains, or fossil plants and animals, found in coal and coal measures, compared with those associated with other fossil fuels. He then took a comprehensive survey of the whole ground trodden throughout the course. Under one division of the subject he had pointed out that the different kinds of fossil fuel, from peat to anthracite, graduate in their composition from that of wood to that of nearly pure carbon. He had intimated that wherever and whenever large quantities of vegetable matter had been accumulated and covered up more rapidly than they had decayed, there seams of coal or of some other mineral fuel had been produced. The chemical changes which the trees and other plants had undergone after their accumulation—as fallen trunks, branches, leaves, and spores, with creeping stems, roots, and rootlets—in wet jungles and peaty swamps, had variously rearranged their constituent carbon, hydrogen, and oxygen. The results were: (1) thin laminæ of hydrocarbonaceous coal, shining or dull, which alternate with thinner films of mineral charcoal (the product of subaerial rotting), where damp forest growths prevailed; (2) layers of spores (white coal of Tasmania), or of leaves (fir needle coal of the Hanover wealden); (3) hydrocarbonaceous coals, more or less homogeneous in structure, where swamp lakes and peat bogs occupied the area of growth. Some coals might always have contained a relatively large proportion of touchwood and charcoal, and have been subjected to pressure, driving off the hydrogen with some of the carbon. In either case, anthracite coals had resulted, and natural distillation had produced various secondary hydrocarbons, such as albertite, bitumen, petroleum, and naphtha. The history of the geological strata, from mountain limestone, through millstone grit, to the coal measures, their disturbances and present position, was thus brought within the reach of man's skill and labor. The lecturer concluded by pointing out that the study of the coal measures was of great importance as a branch of natural history not to be ignored in the general scheme of a good education.

Packing Apples for Shipment.

At the recent horticultural meeting at Rochester, N. Y., Mr. Barry opened the question: "Have there been any recent improvements in the methods of packing and shipping fruit?" by asking "What is the best method of packing fruit for foreign shipment?" He used paper for wrapping the fruit in, but knew of others using chaff in addition. Mr. Vick had tried several ways, but preferred using strong manila paper in which to wrap the fruit. In packing in the barrel he placed a layer of buckwheat chaff between each layer of apples, and in the ends put a deeper layer of chaff. He had shipped several kinds with success in this manner. Mr. Hooker objected to the use of the chaff, as it would be liable to impart a flavor to the fruit. He thought that good fruit, packed solidly, would stand shipment to a foreign market. He would advise picking the fruit as soon as matured. Mr. Moody thought well of the plan of having fruit houses, where the fruit would pass through the sweating process before being barreled. Mr. Hoag had a ventilated fruit house in which he allowed his fruit to cool, and where he kept it till November. Mr. Moody thought the thorough assorting of apples a necessity; they should be handled quickly and very carefully, and be left in the sun no longer than necessary. Mr. W. C. Barry left his apples in the orchard till they had passed the sweating process. He thought they should not be placed in barrels till after that—nor should they be shipped abroad till cool weather commenced. Mr. Woodward said apples should be picked early and handled but little. When they snapped easily from the stem it was time to pick them. They should not be barreled till ready for sale. Mr. Clark picked some apples the last week in October, and had but just opened them. He found them to be in good condition.

NATURAL HISTORY NOTES.

Vertical and Horizontal Leaves.—Griesbach, in his account of the vegetation of Australia (says Mr. Moseley in his "Notes of a Naturalist"), dwells on the close relation of interdependence which exists between the tree vegetation and the coating of grass which covers the ground beneath it, and remarks that the amount of light allowed by the trees to reach the ground beneath them is rendered more than usually great by the vertical position in which their leaves grow. Hence the growth of the grass beneath is aided. It may be that this permitting of the growth of other plants beneath them, and consequent protection of the soil from losing its moisture, besides other advantages to be derived, is the principal reason why, as is familiarly known, two widely different groups of Australian trees, the eucalypti and acacias, have arrived at a vertical instead of a horizontal disposition of their leaves by two different methods. The acacias have accomplished this by suppressing the true horizontal leaves, and flattening the leaf stalks into vertical pseudo-leaves, or "phyllodes." The gum trees, on the other hand, have simply twisted their leaf stalks, and have thus rendered their true leaves vertical in position. There must exist some material advantages which these different trees derive in common from their peculiar arrangement, and the benefit derived from relation to other plants by this means may be greater and more important than that arising from the fact that the vertical leaves have a like relation to the light on both sides, and are provided with stomata on both faces. In support of this conclusion I was told when at Melbourne that when the native vegetation was cleared away from under gum trees they ceased to thrive and in time perished. I was shown a number of gum trees not far from the city, scattered over some public land, covered with only short turf, which seemed to be mostly in a dying condition.

The Power of Movement in Leaves of Conifers.—Dr. Maxwell Masters, at a meeting of the Linnæan Society, Dec. 4, called attention to the contrasts to be drawn between the leaves of the spruce firs (*Picea*) and those of the silver firs (*Abies*), as regards their arrangement, relative position, form, relative size, and internal structure, as described by Bertrand and others. The leaves of the silver firs are endowed with a power of motion in virtue of which they are raised or depressed. On the other hand, the leaves of the spruces are comparatively motionless. In those cases where the leaves have the power of movement there is usually a well-marked layer of "palisade cells" which are absent in motionless leaves. This circumstance has led Dr. Masters to correlate the differences before alluded to with varying degrees of functional activity, and with the adaptations manifested to secure as far as possible to each leaf an equally favorable amount of exposure to light, etc. The very remarkable movements of revolving mutations observable in the "leader shoots" of many conifers during their season of active growth were mentioned as having been investigated by him and the rotation duly registered on a disk.

Migration of Plants from Europe to America.—Professor Claypole, in a lengthy paper on this subject, read before the Montreal Horticultural Society, calls attention to and enumerates the vast number of weeds which have migrated from Europe to America and become so thoroughly naturalized

here that they prevail over some of the plants native to the soil; while only three or four American weeds have crossed the Atlantic and become naturalized in Europe. Having shown that the difference in climate and the conditions of mutual commerce do not fully account for this marked difference in the migrative power of the two floras, he next points out the factthat in the Miocene era the European and American floras were very much alike, but that since that time the European flora has been vastly altered, while the American flora still retains a Miocene aspect, and is, therefore, the older of the two. Professor Claypole is led to conclude that this long persistence of type in the American flora may have induced, by habit, a rigidity or indisposition to change, while the changes in the European flora since the Miocene era betray a plasticity of nature, or power of adapting itself to circumstances, of which the American flora gives no sign. From this view, the European flora is better able to adapt itself to the strange climate and conditions—that is, to emigrate—than the American flora, and being thus made plastic or adaptable, it succeeds in the New World, while the less adaptable American flora fails in the Old World.

The Rose of Jericho.—This curious plant, which in a dried state is often sold as a curiosity, has recently been correctly and well described by the veteran botanist, Mr. J. Smith, ex-curator of Kew Gardens, in a little work entitled "A History of Bible Plants." After detailing certain passages of the Scriptures which are supposed to refer to the "Rose of Jericho," he proceeds to say: "It is an annual, having a tap root from which numerous branches are produced, forming a circular disk about a foot in diameter, at first lying nearly flat on the ground. It has small leaves, and small white flowers at their axis. When the seeds are perfected, the stems become dry, hardened, and incurved, their points meeting and forming a skeleton hollow ball, which in time (by the power of the wind) loses hold of the ground, and, being blown about, rolls and turns like a wheel." This plant belongs to the natural order Cruciferæ, and has been rendered famous by the peculiar hygrometric properties of its stem and branches. It affords a very interesting example of the means by which nature effects the dispersion of seeds. The fruit is a small roundish silicle with two woody valves each, each of which terminates at its apex in an acute point. During the dry season these plant balls are scattered far and wide by the winds over the sandy tracts of land extending from Syria to Algeria, and on the return of the rains the branches spread out, the diminutive silicles burst and release the seeds, which speedily germinate in the damp warm soil. This alternate closing and expanding of the branches continues for many years. Concerning the strange manner in which these singular plants are scattered, the traveler, Dr. Thompson, has written as follows: "When ripe and dry in autumn, the branches become rigid and light as a feather, the parent stem breaks off at the ground, and the wind carries these vegetable globes whithersoever it pleaseth. At the proper season thousands of them come scudding over the plain, rolling, leaping, and bounding to the dismay of both horse and his rider. Once, in a plain north of Hamath, my horse became quite unmanageable among them."

A Fly-catching Plant.—We have one plant in our gardens, says Knapp in his "Journal of a Naturalist," a native of North America, than which none can be more cruelly destructive of insect life, the dog's-bane (*Apocynum androsæmifolium*) which is generally conducive to the death of every fly that settles upon it. Allured by the honey on the nectary of the expanded blossom, the instant the trunk is protruded to feed on it, the filaments close, and, catching the fly by the extremity of its proboscis, detain the poor prisoner, writhing in protracted struggles till released by death—a death apparently occasioned by exhaustion alone; the filaments then relax, and the body falls to the ground. The plant will at times be dusky from the numbers of imprisoned wretches.

Consciousness in the Acquirement of Instincts.—Most naturalists, says Mr. Darwin (*Nature*, January 8), appear to believe that every instinct was at first consciously performed; but this seems to me an erroneous conclusion in many cases, though true in others. Birds, when variously excited, assume strange attitudes and ruffle their feathers; and if the erection of the feathers in some particular manner were advantageous to a male whilst courting the female, there does not seem to be any improbability in the offspring which inherited this action being favored; and we know that odd tricks and new gestures performed unconsciously are often inherited by man. We may take a different case (which I believe has been already advanced by some one), that of young ground birds, which squat and hide themselves when in danger immediately after emerging from the egg; and here it seems hardly possible that the habit could have been consciously acquired just after birth without any experience. But if those young birds which remained motionless when frightened were oftener preserved from beasts of prey than those which tried to escape, the habit of squatting might have been acquired without any consciousness on the part of the young birds. This reasoning applies with special force to some young wading and water birds, the old of which do not conceal themselves when in danger. Again, a hen partridge when there is danger flies a short distance from her young ones and leaves them closely squatted; she then flutters along the ground as if crippled, in the wonderful manner which is familiar to almost every one; but, differently from a really wounded bird, she makes herself conspicuous. Now it is more than doubtful whether any bird ever existed with sufficient intellect to think that if she imitated the action of an injured bird she would draw away a dog or other enemy from her young ones; for this presupposes that she had observed such actions in an injured comrade and knew that they would tempt an enemy to pursuit. Many naturalists now admit that, for instance, the hinge of a shell has been formed by the preservation and inheritance of successive useful variations, the individuals with a somewhat better constructed shell being preserved in greater numbers than those with a less well constructed one; and why should not beneficial variations in the inherited actions of a partridge be preserved in like manner, without any thought or conscious intention on her part any more than on the part of the mollusk, the hinge of whose shell has been modified and improved independently of consciousness?

The Kalmia and its Insect Visitors.—While it is generally admitted that the gay coloration of flowers is mainly subservient to the purpose of attracting bees and other winged insects whose visits play so important a part in the process of fertilization, one important fact has not received sufficient attention. It has already been pointed out by Mr. J. W. Slater, before the Entomological Society of London, that certain conspicuous flowers are avoided by bees, orif visited by them produce an injurious or even fatal effect upon the insects. Among such flowers are the dahlia, the passion-flower, the crown-imperial, and especially the oleander. The honey of the latter is said to be fatal to flies also. The cultivation of the dahlia has been pronounced incompatible with the success of the bee-keeper. A writer in the December number of *Science Gossip* records a few observations made on our American plant, the *Kalmia latifolia*, from which it would appear that this plant may also be included among those whose attractive flowers prove deadly to the bee which visits them for their nectar. It is a well known fact the genera azalea, rhododendron, and kalmia are narcotic, and that the honey extracted from their flowers possesses poisonous properties. Thus, *Rhododendron punctatum* yields, according to Michaux, a honey which is deleterious; and the honey of Trebizond, which is supposed to be derived from the *Azalea pontica*, has poisonous qualities which cause headache and vomiting. The flowers of *Rhododendron arboreum* of India, however, are eaten by the natives, and are likewise made into a confection by them. Notwithstanding the poisonous nature to man of the honey gathered from the flowers of these genera, no mention seems to have been made before of the fact that it is equally so to bees. The visits of bees to the flowers of the *Kalmia* have been supposed to be advantageous to the plant in setting free the anthers, which are lodged in depressions in the corolla, and which when loosened spring forward and discharge their pollen on the stigma.

Narcotism from Nutmegs.

The fact that nutmegs have strong narcotic properties has long been known, but they are in such common use as a favorite condiment used in small quantities that their dangerous nature when taken in large quantity is apt to be overlooked and forgotten, even by those who are aware of their tendency. A physician reports, in one of our medical exchanges, a case where a lady patient during his absence was induced by her old woman nurse to take nutmeg tea. One and a half nutmegs were used in making the tea, and the patient drank the whole of the decoction during the day. About 10 o'clock at night she began to get drowsy, and by 4 o'clock the next morning she was in a profound stupor. At 10 o'clock the next morning the narcotic effects of the nutmeg began to wear off, and by 4 P.M. she had pretty well recovered. The symptoms were about the same as those produced by opium, and the remedies given for them were the same.

Nutmeg in the quantity of two or three drachms has been known to produce both stupor and delirium; and dangerous and fatal consequences are said to have followed its free use in India. Mace, which is the outside covering of the nutmeg, possesses essentially the same properties.

Protection of Young Trees.

Where it is desirable to pasture sheep or hogs in orchards, or where rabbits make depredations, the bark of young trees may be successfully protected by washing the trees in spring, and again in midsummer, for sheep, and in late autumn for rabbits, with soap suds and carbolic acid, or a solution of coal tar and whitewash. Both are sure in accomplishing the end in view, and are valuable in keeping off the borer and in giving a healthy surface activity to the sap, which will make the bark look fresh and healthy. An ounce of carbolic acid to a pail of soap suds is sufficient.

Preparation of Rhea Fiber.

The Government of India, in 1870, and again in 1877, offered rewards for the discovery of a cheap and rapid mechanical or chemical process for the preparation of rhea fiber, which is at present worth from £40 to £50 per ton in England. Fifty thousand rupees for the best invention, and ten thousand rupees for the next best. A keen competition promises to take place shortly at Saharanpur, between twenty-three gentlemen from England, America, France, Denmark, New Zealand, Batavia, Hungary, and from parts of India. The judges of the trial will, says the *Homeward Mail*, have to describe the processes and determine whether the conditions of the government notification have been complied with or not, while the quality of the fiber produced will be left to experts at home.

Effects of Kidney Diseases Upon the Eyes.

The frequency with which retinal changes are found in kidney disease has been variously stated by different authorities. Earlier statistics were based on affection of vision, and the frequency assigned was altogether too low, while some ophthalmic surgeons, seeing cases only in which sight was impaired, have thought that retinal changes were almost invariable. Wagner found albuminuric retinitis in 9 per cent of the cases, Galezowsky in 33 per cent, and Laudouzy in almost every case. It is, however, well known that the frequency with which the retinal changes occur varies much in different forms of kidney disease, and it is, therefore, desirable that in observations which are made, the forms of kidney disease should be distinguished. This has been done by Mr. Eales, of Birmingham, who, in an interesting communication to the current number of the Birmingham *Medical Review*, has described an investigation of the state of the retina in 100 cases of granular kidney, the primary object being to determine the percentage of cases in which retinal changes are present. For the diagnosis of the renal disease in every case Dr. Saundby was responsible. The results contained confirm nearly the statement of Galezowsky, alterations being found in one-third of the cases. They confirm also the fallacy of taking sight as the test of retinal integrity. In 46 cases inquiries were made as to the state of vision before atropine was instilled; in 28 of these complaint of bad sight was made, but in only 6 (that is, a little more than 1 in 5) could any obvious abnormal condition be discovered in the retina; while in 18 persons, who stated that their sight was good, retinal changes, such as specks, were found in 5. The frequency with which considerable retinal changes do not materially impair sight is shown by 6 cases in which vision was carefully obtained by test types and lenses, and found, even with dilated pupils, to be nearly normal, and yet in all considerable changes were found in the retina.

The number of cases in which some abnormal change was found in the retina was 28, in 12 of which the changes existed in both eyes, while in 16 they existed in one eye only. Observers have usually described the changes as bilateral, and Mr. Eales thinks that his observations can only be reconciled with those of others by supposing that the affection often attacks one eye before the other, and that it gets well in one eye before the other. In the 12 cases in which changes were found in both eyes, 4 had diffuse retinitis, with "fibrinous" patches and œdema, and also whitish glistening patches; 1 had diffuse retinitis in one eye with only one hemorrhage in the other eye; 5 had many whitish round patches "of the atrophic kind," and 2 had only similar small patches. Of the 16 cases in which changes were found only in one eye, in 6 several white round patches were found, in 5 one or two spots only; in 1 there was a single hemorrhage near the disk; in 2 a few black specks were found, associated in one case with white specks, the black being in the center of the white speck. In addition to these 28 cases of retinal change 3 others presented slight changes in the papilla, commencing or subsiding neuritis. In 14 cases opacity of the lens existed, double and incipient in 11 cases, single in 3 cases. The presence of these alterations bore some relation to the amount of albumen in the urine, and 1 in every 2 patients with constipated bowels presented retinal changes, while such changes were found only in 1 in every 6 with open bowels.—*Lancet.*

The Transmission of Scarlet Fever by Milk.

A report has been issued by the Local Government Board on a sudden outbreak of scarlet fever at Fallowfield, near Manchester, England. The outbreak included 35 persons, belonging to 18 families, and of the individuals who suffered not less than 24 were attacked within 36 hours, between Sunday morning and Monday evening. Dr. Airy was directed by the Local Government Board to investigate this outbreak, and the results of his investigation are, says the *Lancet*, given in the report now before us. The outbreak was quite local, and the different details elicited tended to the general result that the infection had been distributed to the families through the agency of a particular milk supply. The facts bearing on this point do not well admit of any other interpretation. The question of the mode in which the milk could have become infected was not so fully cleared up, but it is shown that one of the milkers on the dairy farm lodged in a farm-house where scarlet fever was present at the time when the milk presumably became infected, and it is suggested that the infection was communicated to the milk, in some way undetermined but not inconceivable, through his agency. The report throughout is of very considerable interest, and forms an important contribution to our knowledge of the *mechanism*, if we may so write, of certain of the observed phenomena marking the progress of infectious diseases.

American Rum Drinkers.

Referring to the drinking habits of the Americans, Mr. Read gave it as his opinion that sobriety was not so real as it appeared, for a great deal of drinking goes on privately. He said: "The American drinks so differently from the Englishman. They take grog as Englishmen take physic. They never meet together for sociability, hilarity, and noisy revelry; but rather go up to the bar, and taking a small glass of whisky, toss it off, and immediately follow this up by taking a glass of iced water—just as children in England take castor oil." As regards Sunday closing, Mr. Read's experience in America has convinced him that he ough. not to vote for our Sunday closing bill when it comes before Parliament next session. He found that while the front door

of grog shops was closed by law, the back doors were open by the common consent of the people; and he justly remarks that "to pass laws which are never meant to be enforced is worse than passing no laws at all." Altogether, Mr. Read's visit to America has convinced him that the prohibitory policy in connection with the liquor traffic in that country has been a failure, and it would therefore be a great mistake for us to follow their example.—*Brewers' Guardian.*

THE CONDITION OF FRENCH WORKMEN.

The British Society of Arts, just before the last French Exhibition, appointed a number of experts, in different lines of business, to prepare special reports covering the state of many of the principal industries, as represented there. One of the topics to which especial attention was directed was the condition of French workmen, which is considered with reference to: 1. Hours of work and wages; 2. Rent and cost of living; 3. Organization among workmen; 4. Technical schools and art teaching; 5. Home life.

These so-styled "Artisan Reports" have been published very tardily, ample time having been taken in their preparation; but the one above noticed, which has just been brought out, can hardly be said to add materially to the information which has many times heretofore been laid before American readers by the publication of our consular reports. Particular stress is laid on the long hours of which the French workman's day usually consists, the time of commencement varying more than in England or here, but the day usually lasting ten or twelve hours. Nothing, however, is mentioned in regard to the generally easy and comfortable way in which they work, as though the idea of accomplishing a certain amount in a given time was never an element in their calculation. The average rate of wages is generally lower than in England, though there are many trades in which they are about equal, or the difference is but slight. Mechanical engineers are reported as receiving 5½ francs per day of eleven hours, while smiths earn 8½ francs for twelve hours, fitters 6 to 7 francs, and pattern makers 7 to 9 francs for a day of ten hours, the wages of the smaller factories being slightly higher than those paid in the larger establishments; a first-class mason gets from 8 to 10 francs a day, and a second-class or rough mason from 6½ to 7 francs, an ordinary bricklayer also receiving about the latter figure. It would not be matter of surprise, if what would be considered in America a good day's work were obtainable in France at these low rates, that the French Government is laying out such vast schemes of internal improvement, in the way of railroads, canals, grand highways, and harbor improvements, but it is questionable whether, considering the amount of labor performed, the rates are really very much cheaper than here. There is one great difference, however, and that is that nearly every one in France is employed; there are few idlers among what are known as the productive classes, and not only the men but the women and children also are active participants in the labor of bread winning.

In the matter of rent and cost of living, as compared with the rates in England, these "expert" reporters vary widely in their conclusions. Probably it would be found, that under equal circumstances, there would be little variation between France and England, but it is not easy to make a comparison that is of any value, for the French laboring classes are not only extremely economical, but a large proportion of them limit themselves even as to the amount of their consumption of the extremely coarse fare on which they principally subsist. They are frugal even to parsimony, and will generally save something, no matter how small their income, stinting themselves in their daily fare, and wearing only the coarsest clothes in order to accomplish this, in all of which they follow exactly the opposite course from the English mechanic, who will have his roast beef as often as possible, and will in anything be stinted rather than in the satisfaction of his stomach, whether he saves or runs in debt, if the latter be possible.

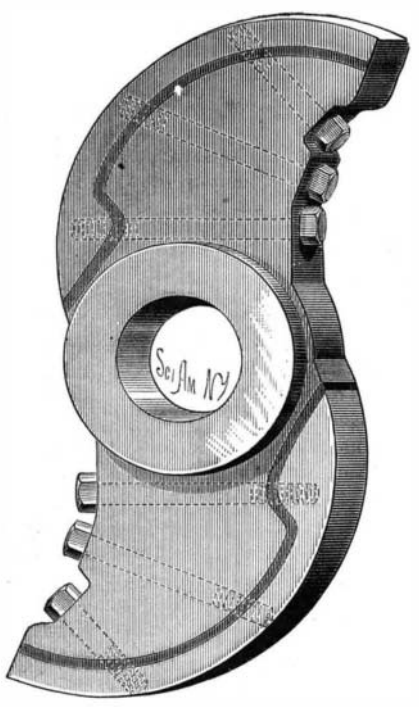
The almost entire absence of trades unions in France is noted here, as it is in almost every other treatise on French industry. The laws would not allow such associations of this kind as we have here, and the political societies or clubs, which are so numerous, though they discuss labor questions to some extent, are generally formed of members of different trades, and so have little or no influence on the rates of wages in any one industry. One great obstacle, however, to trades union organizations, and which operates most effectually in the prevention of strikes, not only in France but in Germany and other parts of Europe, is the great number of special organizations for the benefit of workmen and their families. This matter is treated as of no account in these reports, and it is stated that workmen out of employment or in distress have generally to depend on the government or private benevolence. They have not, it is true, the funds of any trades union society to fall back upon, but in a large proportion of the considerable manufacturing establishments in France a small sum is regularly set aside weekly or monthly by the employer, which is invested so as to form a fund for the relief of such cases.

Rewards are also given for exceptional merit, and for length of time in continued service, so that each year of employment in the house adds to the amount which a man or his family can obtain when old age or sickness prevents his earning his livelihood. In not a few cases, also, schooling for the children and medical attendance for the family are provided, the advantages of which are more or less freely accorded as the workman has proved himself steady and faithful. One large Paris manufacturer, employing over two thousand hands, has also founded a fund, to which he was a liberal contributor at first, and which is invested in government securities, which provides a pension on which worn-out employes, who have been in the establishment a sufficient number of years, can live comfortably on retiring, and those who remain for only five years can have, on leaving, if they leave for no misconduct or dereliction, either a small annual allowance with the privilege of again returning to work, or a lump sum if they prefer the latter. It is because there are so many benefits of this kind, accruing from continued employment and good character, in a large proportion of the French manufacturing establishments that we have so little of strikes there. There is a hearty good will and accord between employer and employed, which is not generally found here, and which goes farther to prevent labor troubles than all the laws which governments can exact or the payment of even the highest rates of which the most ardent trades unionist could ask.

IMPROVED CAM FOR STAMP MILLS.

The annexed engraving represents an improvement in the construction of cams, such as are commonly used in lifting the stamps of crushing mills. The invention consists in a removable shoe attached to the body of the cam by means of bolts, and backed by an elastic cushion or packing. This construction admits of the ready replacement of the shoe when worn, and it gives to the cam a yielding quality, which not only saves it from undue wear, but also modifies the action of the cam to such an extent as to prevent all violent and sudden blows, which are commonly so destructive to stamp mills.

Although the joint surface between the shoe and the body of the cam may be plain or corrugated, the inventor prefers the form shown in the engraving. The bolts which hold the shoes pass rather loosely through the cam body to admit of the yielding of the shoe, but they are screwed firmly into the shoe and move with it. In the cam represented by the



MOORE & DYKES'S CAM FOR STAMP MILLS.

engraving three bolts are employed to held each shoe, but we are informed by the inventors that two bolts are sufficient.

In case the shoe becomes beveled after considerable wear it can be changed from one arm of the cam to another, or to any other cams in the battery.

This useful improvement has been recently patented by Messrs. L. A. Moore and J. Dykes, San Francisco, Cal.

Zincography for Amateurs.

In a recent paper read before the London Society of Arts, Mr. Thomas Bolas, F.C.S., described zincography as a simple and easy mode of printing in the following fashion: Zincography, he said, is similar to lithography, except that a zinc plate is employed in the place of the lithographic stone. The so-called transfer paper is merely a moderately fine paper which has been brushed over, on one side, with a mucilaginous mixture, prepared by boiling together the following: Water, 1,000 parts; starch, 100 parts; gamboge, 6 parts; glue, 1 part. This paper is written upon with the ordinary commercial lithographic writing ink, which has been rubbed up with water like an artist's water-color. The writing being dry, it is necessary to moisten somewhat the back of the transfer by means of a damp sponge; after which it is laid face downward on a sheet of ordinary roofing zinc, which has been previously cleaned by means of emery cloth. Both being now passed together under the roller of a small press, the transfer adheres to the metal plate; but on damping the back of the paper it becomes easily removable, leaving the writing on the zinc. The face of the zinc plate is now gently rubbed over with mucilage of gum arabic, which is all the better for being slightly sour, and the excess of gum having been sponged off, an India rubber inking roller, charged with ordinary printer's ink, is passed over the still damp zinc plate a few times. The ink takes only on the lines of the transferred writing, and it is now merely necessary to lay a sheet of white paper on the plate and to pass both through the press to obtain an impression—an exact reproduction of the original writing.

Any number of copies can be printed by repeating the operations of damping and inking. The zincographic process, thus simplified, is rapid, economical, and within the reach of every one.

Why Teeth Decay.

Upon a careful review of the opinion and experiments of our best investigators, says Doctor S. M. Prothro in a paper read before the Tennessee Dental Association, it is conclusive that there are but two active agents in the process of dental caries, namely the action of acids and the development of a vegetable parasite, the *Leptothrix buccatis.* By actual experiments it is demonstrated that it does not require strong acids to separate the phosphoric and carbonic acids from the lime contained in the tooth substances. Even water that contains carbonic acid will dissolve the calcareous salts. And it seems from a circumstance that transpired under the eye of Mr. Spence Bate, that water alone can dissolve the teeth. A lady having two sets of artificial human teeth, placed one set in water to preserve it till she had worn out the other. At the expiration of seven years, the set that she had kept in water was as much corroded as the one she had worn in the mouth. This case corroborates a statement made by Weil and Heider, that at the end of ten days fungi had attacked the enamel and dentine of the teeth that had been kept in pure water, and that in a few weeks the tissues were pierced with holes like a sieve.

All mineral, as well as vegetable acids, act promptly on the teeth. "In forty-eight hours acetic, citric, and malic acids will corrode the enamel so that you may scrape a great portion of it away with the finger nail." Acid tartrate of lime, having a greater affinity for the lime of the tooth than for its own base, will rapidly destroy the enamel.

Grapes, in forty-eight hours, will render the enamel of a chalky consistence. Vegetable substances are inert till fermentation takes place and acetic acid is formed. Sugar has no deleterious effect, only in the state of acetous fermentation. Animal substances exert no injurious effect until putrefaction is far advanced.

Novel Mode of Preserving a Man's Reason.

A curious story is going the rounds of the English newspapers of an exhibition in the show windows of one of the leading jewelers of Vienna. The object of attraction is a brooch magnificently studded with gems, in the middle of whose chasing is inclosed the most singular of centers—four common, old, bent, and corroded pins. This brooch is the property of the Countess Lavetskofy. The pins have a history, of course. Seven years ago Count Robert Lavetskofy, as the story runs, was arrested at Warsaw for an alleged insult to the Russian Government. The real author of the insult, which consisted of some careless words spoken at a social gathering, was his wife. He accepted the accusation, however, and was sent to prison.

In one of the lightless dungeons in which the Czar is said to be fond of confining his Polish subjects, the unfortunate martyr for his wife's loose tongue spent six years. He had only one amusement. After he had been searched and thrown into a cell, he had found in his coat four pins. These he pulled out and threw on the floor; then in the darkness he hunted for them. Having found them, perhaps after hours and even days, he scattered them again. And so the game went on for six weary years. "But for them," he writes in his memoirs, "I would have gone mad. They provided me with a purpose. So long as I had them to search for, I had something to do. When the decree for my liberation as an exile was brought to me the jailer found me on my knees hunting for one which had escaped me for two days. They saved my wife's husband from lunacy. My wife, therefore, could not desire a prouder ornament."

The Wheat Harvest of 1879.

The wheat crop of the whole world for 1879 shows a deficiency of over 375,000,000 bushels, nearly 200,000,000 bushels of the deficiency falling to Europe. The following table, compiled from the *Bulletin des Halles et Marchés,* shows the yield for each large wheat raising country compared with the average yield:

	Average Yield Bushels.	Yield for 1879. Bushels.		Average Yield Bushels.	Yield for 1879. Bushels.
United States	337,500,000.	337,500,000	Roumania	27,000,000	22,500,000
France	230,172,000	172,125,000	Belgium	19,150,000	14,650,000
Russia	180,000,000	157,500,000	Portugal	6,750,000	5,675,000
Germany	99,000,000.	90,000,000	Algeria	20,500.000	16,875,000
Spain	94,500,000	78 750,000	Canada	13,500.000	13,500,000
Italy	87,550,000	67,500,000	Australia	13,500,000	14,650,000
Austria-Hungary	76,500,000	63,000,000	Egypt	13,500,000	11,500,000
Gt. Britain	83,500,000	47.500,000	Netherlands	4,615,000	3,375,000
Turkey	34,500,000	29,500,000	Greece	3.500,000	3,375,000
			Servia	3,375,000	2,812,500
			Denmark	2,250,000	2,250,000

How to Obtain Sleep.

The following is recommended as a cure for sleeplessness: "Wet half a towel, apply it to the back of the neck, pressing it upward toward the base of the brain, and fasten the dry half of the towel over so as to prevent the too rapid exhalation. The effect is prompt and charming, cooling the brain and inducing calmer, sweeter sleep than any narcotic. Warm water may be used, though most persons prefer cold. To those who suffer from over-excitement of the brain, whether the result of brain work or pressing anxiety, this simple remedy has proved an especial boon."