action or keeping up a formal conversation while the intellect is delighting itself in wholly remote fields of thought or imagination, so beautifully described in Xavier de Maistre's "Voyage autour de ma Chambre," under the figures of *le bête et l'ame*, illustrates how closely the ordinary processes of the mind may parallel these extraordinary vagaries.—*Medical and Surgical Reporter.*

MISCELLANEOUS INVENTIONS.

An improvement in oil cans has been patented by Mr. Jacob Rhule, Jr., of Pittsburg, Pa. The object of this invention is to provide a safe and convenient receptacle for oil; and it consists in providing an oil can with a stopper which, if the can be accidentally overturned, will not allow the oil to escape.

Mr. William Huey, of Cambridge, Md., has patented an improved means for transporting eggs and other fragile or perishable articles. It consists, first, in a case formed with parallel partitions subdivided into cells for the eggs by elastic wings secured flexibly upon one side to the parallel partitions, and overlapping at their free ends to form expansible cells or pockets to receive and protect the eggs.

Mr. William A. Galbraith, of Flint, Mich., has patented an improvement in that class of carriage poles that are capable of being adjusted and readily fitted to vehicles of any width, the object being to decrease the weight of the poles and make them more durable and effective in their operations.

Mr. James W. Hammett, of Willow Island, West Virginia, has patented a simple and effective apparatus for making wells. It consists of several distinct parts or tools that must co-operate to effect the purpose aimed at. The invention cannot be clearly described without engravings.

Mr. Louis M. Candidus, of Brooklyn, E. D., N. Y., has patented an improved apparatus for curing leaf-tobacco by means of steam without contact between the steam and tobacco, and at the same time carry off the vapors expelled from the tobacco.

Mr. James B. Parker, of Memphis, Ala., has patented an improved cotton picker, which consists in combining with a suitable framework and driving mechanism improved devices for picking the cotton from the bolls, for removing the fiber from the pickers, and for carrying off the collected fiber.

Mr. William W. Bolles, of Toledo, O., has patented an adjustable ornamental window cornice that without alteration can be adjusted to a window of any width. The invention consists of an ornamental piece of moulding, on which are secured thicker and grooved or channeled edges, and on each end of which is rigidly fixed a mortised truss, the whole forming the center piece of the cornice. The side extensions of the cornice consists of two pieces of moulding that are made to slide in the mortises of the trusses and the channels or grooves of the edge strips, and meet behind the center piece. The mortises in the trusses conform in their general outlines with the outlines of the mouldings, and the trusses are also cut through from their tops to the mortises, in order to make them so elastic that they will not bind on the sliding cornice extensions.

Mr. William C. Doddridge, of New Madrid, Mo., has patented an improved heating device of the kind forming an attachment or appendage of a stove or furnace pipe, and commonly employed as a substitue for a stove or grate in apartments contiguous to that in which is situated the stove or furnace with which such pipe connects.

Mr. Charles Rosencrans, of Philadelphia, Pa., has patented an improved box loop for harness saddles provided with transverse ribs which keep the leather covering in its place, and also protect it from abrasion and wear, and having a solid flat bottom with centrally projecting lugs.

Steam Pressure and Temperature.

The temperature of steam developed from water by boiling will be in an unconfined state 212°. This temperature is increased by putting a pressure on the steam, *i. e.*, by confining in a closed vessel, provided with a safety valve to work at a certain pressure. The following will give an idea of the ratio in which the temperature rises in steam under pressure:

Pressure.	Temperature, Fahr.	Increase of Temperature.
1 lb.	214°	
100 lb.	338°	124° first 100
200 lb.	388°	50° second 100
300 lb.	422°	34° third 100
400 lb.	448°	26° fourth 100

Natural Lime.

To the Editor of the Scientific American:

In Vol. xlii., No. 2 (new series), SCIENTIFIC AMERICAN, January 10, 1880, page 25, a correspondent of the *American Architect* is quoted, giving a lucid account of "Kansas Natural Lime." He closes with the inquiry, "Does such a strange product as this occur in any other section of our continent?"

I answer, yes. From 1870 to 1874 I was United States Consul at Paso del Norte, Mexico. And, while prospecting for silver ore, I discovered a large deposit, in what miners term pocket formation, of natural lime, located in blue limestone, in the foot hills, one and one-half miles west from the city of Paso del Norte, Mexico. I gave it various trials, and found it to possess all the good qualities of manufactured lime, and for whitewashing far superior to the manufactured article. WM. M. PIERSON.

Fort Bayard, Grant County, New Mexico, Jan., 1880.

New Transit Instrument.

At a recent meeting of the Massachusetts Institute of Technology, at Boston, Mr. S. C. Chandler exhibited and explained a new astronomical instrument designed by himself, for the determination of time and latitude. It is, in brief, a self-adjusting transit instrument. Instead of depending upon the ordinary means of accuracy, such as nicety in fitting the pivots, setting and observation of spirit levels, and other parts, the new instrument is made to float on mercury, and thus level and adjust itself. The instrument was explained as follows by the inventor:

It consists of a base of walnut, with approximate leveling screws at the four corners. From the middle of this base rises a pillar of black walnut firmly bolted to the base and surrounded by collars of hard brass. An outside sleeve of hard brass which turns on these collars supports the remainder of the instrument; this sleeve being rotated in azimuth by a rack and pinion movement, and provided at its base with a graduated setting circle. On top of this sleeve is a wooden crosshead, which supports a wooden trough in the form of a hollow rectangle, and in this trough is placed mercury to a depth of one-eighth of an inch. The trough is constructed of wood instead of brass, because the mercury would attack brass. Whether it would be better to use cast iron is an open question.

In this trough, on the mercury, there floats a wooden float, also in the form of a hollow rectangle, and nearly as large as the inside of the trough, this float being held in position at the middle of the two sides by two cast iron pins, which move in vertical slots in the sides of the float, and which are sufficiently loose not to interfere with its floating freely, but which serve to prevent any violent or sudden motion.

The above mentioned float has attached to it two brass arms, which support the telescope, the latter projecting through the hollows of the hollow rectangles of the float and trough.

The trough is not supported in the middle, but nearer one end, in order to allow of zenith observations; and on this account a counterpoise is attached at the other end of the trough.

The attempt has also been made to so proportion the parts as to bring the center of gravity of the floating part as near the axis of oscillation of the telescope as possible, in order to reduce oscillations due to jars, etc.

The illumination is effected by a series of reflectors, and comes from the side. The cross hairs are horizontal, and not vertical, as in the transit. The reason for this will be explained later. In using the instrument the telescope is set at a certain inclination to the vertical, and as the instrument is rotated in azimuth, the line of sight sweeps out a horizontal small circle of the heavens, *i. e.*, a circle of which the zenith is the pole.

For the determination of the zenith, the free upper surface of a liquid is used, and we have dispensed with the error of pivots, the error of level, and the error of azimuth; and have left only what is, in a certain sense, analogous to the error of collimation in a transit instrument, the characteristic of both errors being that the telescope describes a small circle, parallel, but very close, to the circle in which it is intended to revolve. The amount of this deviation in this instrument is not, however, determined by reversals of the telescope, as in the case of the transit, but by observation of the stars, in a similar way to that by which the azimuth error of the transit is found. As to the disturbance of the instrument by oscillations, the most violent oscillations I have been able to produce have required thirty seconds to have their effect dissipated, and after this time has elapsed the instrument is as quiescent as though it were mounted on stone.

It is, of course, specially adapted for observing equal altitudes, and can also be used to observe the transit of stars across any desired small circle having the zenith for a pole, and hence the reason why the cross hairs are horizontal instead of vertical.*

All observations are influenced by refraction, but refraction operates to elevate all the stars equally at the same time. Hence we can disregard the error of refraction in a series of observations taken so near each other that there is no probability that the coefficient of refraction of the air has changed, and we can simply account it as part of the instrumental error; it having the same coefficient, hence when the observations are reduced to middle time this error is almost wholly eliminated. Next, as to the results that can be obtained by this instrument, I have not yet been able to make a great many observations, but those that I have made encourage me to believe that when as good mounting is given to it as is given to an astronomical transit, better results can be obtained with it than with the latter. I have used it very roughly, making observations from the roof of my house, which was subjected to a constant jarring from the teaming in the street below, and where the instrument was exposed to the wind.

I have compared my results with those of larger coast survey transits, and mine are the best.

I have not yet determined all the constants of the instrument. I find that the wind does interfere with it somewhat when employed in the open air and unprotected, but the deflections from this cause are but momentary, and errors due to a draught would be nearly eliminated were a greater number of cross hairs used.

Next, as to latitude. The transit instrument, when placed in the meridian, is used only for time; it can be used for the determination of latitude if placed in the prime vertical. The Coast Survey have introduced for this purpose the zenith telescope, and have obtained with it the very best results. To compare my instrument with this is a very severe test; although I have had only three evenings on which I could make observations for latitude, the results obtained are remarkably good. The claims, therefore, that I make for my instrument are the following, viz:

1. The ability to use any part of the heavens that are not obscured by clouds. In using the transit it is often impossible to obtain observations when clouds hang in the meridian, even though there be any amount of clear sky on either side. With my instrument we can use any region of clear sky in the heavens, as we can use any horizontal circle whatever; although the use of the same circle all the time renders the computations easier.

2. There is only one instrumental error to determine, instead of four.

3. This instrument is unaffected by errors in mounting.

4. Simplicity in use; requiring no readings of level nor reversals. In the use of the transit about one-half the time is taken up by these processes, which are unnecessary with my instrument.

5. The construction is very cheap.

6. Combination of a time and latitude instrument in one.

7. It admits also of the application of a delicate micrometer on an entirely new principle, as a micrometer screw carrying a weight could be mounted on the float, thus enabling us to move the center of gravity of the floating part, and to tilt the axis of the telescope. We can thus apply here the same methods that we can in the zenith telescope.

The Atmosphere and Yellow Fever.

During the yellow fever epidemic of 1879, Mr. William Van Slootin, C.E., of New Orleans, made chemical analyses of the air from September 9 to November 24, and found, according to Dr. Clendinning, of Fort Lee, N. J., a series of extraordinary variations in the amount of free and albuminoid ammonia to the million of cubic feet of atmosphere. These corresponded very curiously with the progress and fluctuations of the epidemic. For instance, on September 9, the analysis showed 125·62 grains of free and 350·56 grains of albuminoid ammonia to each 1,000,000 of cubic feet of air. On September 19 the amount of albuminoid ammonia stood at the extraordinary figure of 400·75 grains. This was its highest point, and, with many fluctuations from day to day, it gradually declined as the epidemic wore out its fury, until on November 24 the amount was only 47·25 grains. The curve of the free ammonia was less regular, but the decline had a general correspondence with that of albuminoid, until on November 24 the amount had fallen to 23·31 grains. The amount of ozone showed a similar variation from half a grain per 100 cubic feet of air on September 18, to seven grains on October 22, from which it appeared that the increase of ozone was accompanied by a constant decrease of ammoniacal products. The fluctuation of both from day to day and week to week, as the wave of the epidemic rose and fell, was very striking.

Surveying by Photography.

This was the subject of a lecture lately delivered at the Plymouth Athenæum, by Mr. W. G. Tweedie. The lecturer proposes to use for the purposes of surveying a camera by which a cylindrical projection of the objects is taken on a flat plate. Two such photographs, taken from the extremities of a measured base line, will, he declares, supply all the necessary data for making a map of the whole of the country in front. From these two photographs, by means of two scales of simple construction, the surveyor's work hitherto done in the field will be equally well performed in the office, and by the use of dry plates, the operator is relieved from all chemical operations in the field. The plates can be bought ready prepared, and sent to the professional photographer to be developed. The lecturer exhibited several remarkable instantaneous photographs he had taken, and explained the nature of the camera used and the *modus operandi*. In the subsequent discussion, it was suggested that Mr. Tweedie should practically test his invention by surveying on his new method some of the ruined castles on the moor.

Electrotyping with Iron.

Herr Böttger describes a process for steeling copper plates by electrolysis. 100 parts of ferrous-ammonia sulphate, together with 50 parts of sal-ammoniac, are dissolved in 500 parts of pure water, a few drops of sulphuric acid being added to acidulate the solution. The copper plate is connected to the negative pole of a battery of two or three Bunsen elements, an iron plate of equal size being employed as an anode. The solution is maintained at from 60° to 80°. The deposit of iron is of a hard, steel-like quality, and is very rapidly formed.

Capsuling Bottles.

In France a new system of capsuling bottles has come into vogue which is more rapid than the use of metal capsules, and is thought, by some, to give a more elegant effect. The neck of the bottle is dipped into a viscous volatile liquid and immediately withdrawn with a rotary movement. This leaves a transparent capsule, the effect of which is improved by first attaching a monogram or trade mark to the top of the cork or upper end of the bottle neck. The following is the formula for the liquid: Yellow resin, 20 parts; ether, 40; collodion, 60; fuchsine, or other tint, *q. s.*

Exhibition of Earthenware.

An International Exhibition of earthenware, chalk, cement, and gypsum industry is to be opened at Berlin from June 29 to August 10, 1880. The following are the rules for sending objects to the Exhibition:

1. Only such objects can be sent to the Exhibition as are directly or indirectly made of brick, tiles, earthenware, chalk, cement, or gypsum.

2. The committee has to decide about the named objects, and of the amount of space granted to the exhibitors.

3. Application must be made before the 15th of March, 1880, but it is most desirable to have the applications as early as possible, so that the space may be fixed, especially as there is the prospect of nearly all nations taking part in the Exhibition.

4. The forms of application are to be made in duplicate by each of the exhibitors, and to be sent to the president of the committee—Herrn Paul Loeff, Privat Baumeister, Berlin, S. W.

5. Should the object be admitted, a certificate of admittance will be made out on the information paper, which at the same time contains a declaration of the exhibitor. One of the application papers will be returned as a receipt. Only those exhibitors who possess a receipted form can be admitted to exhibit different objects.

6. All the admitted objects must be at their proper places (appointed by the committee) three days before the opening of the Exhibition, in perfect order and dry colors. The committee reserves the right of deciding about the unoccupied space, without being obliged to return the money. Other places than those given by the committee are not allowed to be used.

7. The committee will give a number to each object, before it is placed in the Exhibition building, which will correspond with the number in the Exhibition catalogue. This number must be fixed to each object, so that it can be seen for the whole time the Exhibition is open.

8. All exhibitors, their agents, or their workmen, must submit themselves to the committee, or to the officials of the Exhibition.

9. The committee does not undertake any responsibility in case of damage or loss of those objects which are brought to the Exhibition, but they will take the greatest care in watching the objects. Fire or light can only be used by specially written allowance from the committee.

10. The committee will undertake to arrange for the fire insurance if desired, but the expenses fall upon the exhibitors.

11. The price for space occupied is fifteen marks per square meter; unoccupied space will be eight marks the square meter. The minimum price for occupied space will be twenty marks, and for unoccupied space twelve marks per square meter.

12. The exhibitors must clear their objects immediately after the Exhibition is closed, but no object can be removed before the final closing.

13. An Exhibition agency, which will be put under the control of the committee, will carry out all commissions given by exhibitors for a small payment. The exhibitors have to take upon themselves the transport of the Exhibition objects, as well as unpacking, arranging, and repacking. The committee has made arrangements to have the work done by their agents at a small expense, in order that the exhibitors may be saved from overcharge, as has been the case at former Exhibitions. If desired by exhibitors, artisans and workmen can be provided for by the committee at the lowest rate.

14. No exhibitor is allowed to put an engine into motion before he has obtained special permission from the committee. This permission will be given on the fulfillment of the rules. The supply of the necessary material is to be arranged in each case with the committee.

15. If special architectural plans are desired, they have to be named under No. 9 in the forms of announcement; if necessary, designs should be added. At the wish of the exhibitors, the committee will undertake the erection of such engines as are required.

16. Those exhibitors who want special foundations must have them erected by the committee, and pay the necessary expenses.

17. Prizes will be given in each section, but a juror cannot be an exhibitor in his own section. The names of the jury will be published in the middle of July.

18. The Exhibition catalogue will contain advertisements, and each exhibitor can make use of the allotted space by paying 75 pfennings (or 9½d.) for a *petit* line.

19. The committee reserves the right of altering these rules, and retains the power of refusing such applications as are thought unsuitable.

20. Demand will be made for the return by the railway authorities, gratis, of all objects which are not sold, the result of which will be published in due time.

PAUL LOEFF,
The President of the Committee.

DURING the recent Applied Science Exhibition, Paris, a diploma of honor was awarded to Count de Beaufort by the Society for the Aid of the Mutilated Poor for the best display of artificial limbs. Among the exhibits was a carpenter who had artificial arms, but was to be seen daily working at his trade; also a girl in same condition who sat knitting, much to the satisfaction of the spectators.

American and English Hardware.

At a recent meeting of the Manchester Scientific and Mechanical Society, a paper on "American and English Hardware," was read by Mr. F. Smith. A circular paper was read last winter by Mr. Smith, when he spoke strongly of the apathy and the want of inventive and progressive spirit which seemed to characterize the English manufacturer. Since then a number of samples of builders' hardware had been sent to him by both American and English makers, and some of these he laid before the meeting.

After describing the various examples, in which he pointed out the superiority of the American over the English article, Mr. Smith said that as he had not a personal knowledge of the rules of the various trades unions in the lock districts, he was not prepared to assess the value of the statement made by some people to the effect that much of the inferiority of the English goods was to be attributed to the absurd and anti-progressive action of the unions. But he failed to see how they could be justly held responsible for inferior castings, bad japanning, and clumsy design. For a long time our manufacturers, having had command of both their own and foreign markets, had been masters of the situation, and the result had been, first, a laxity in the supervision of the processes of manufacture. So long as the article produced by the "garret master" brought profit to his principal, the clumsy, wasteful, "rule-of-thumb" process by which it was produced was not considered, and if the late depression had given our manufacturers time to think, they might say, "Sweet are the uses of adversity."

Secondly, this abundance of work, if he was rightly informed, had led in many cases to the buying up and suppressing of improvements; and, thirdly, this great demand had led manufacturers to lose sight of the quality of their goods, and to enter into competition with each other to produce a low-priced article. After condemning the pestilent fallacy which was often raised, "our customers demand these worthless goods," Mr. Smith said that if they wanted to get an idea of how our national prosperity was influenced by the quality of the goods we manufactured they had only to consider the position held by certain firms. Why should a Chubbs lock or a Whitworth lathe command higher prices than even the good work of less known firms? Simply because the name guaranteed the quality, and when the same could be said of English goods generally we should be in a fair way to "enjoy our own again."

Another and most important factor in the sum of dead weights under which we had to struggle was our absurd patent laws, and if our legislature had set out with the intention of suppressing the inventive genius of the country they could not have succeeded more completely than they had done.

In order that we might improve our goods it seemed to him that we must discard many of our old and obsolete patterns. We must adopt a method of founding which would secure a clean casting. We must copy the Americans in the employment of mechanicians and artists, one to arrange the mechanical portions of the work and the other to design suitable and artistic forms. We must look far more to our reputation for good and honest work, and we must agitate for such an alteration of our patent laws as would place it in the power of the skillful artisan to protect the fruits of his brains at a reasonable cost.

In conclusion, he believed that there was enterprise and skill sufficient among our workmen and manufacturers to enable us to recover much of our lost ground, and the samples of English goods which he had displayed that night showed a marked advance upon those of three or four years back, while the prices were low enough to secure a sale, although in some cases a better article could be produced at the same cost.

A discussion followed the reading of the paper.

The chairman observed that there had been great room for improvement in this branch of trade for the last twenty years, and Mr. Smith had attributed this want of improvement to the right cause. This class of goods had not been made by mechanical men. One manufacturer got into a certain groove, and they would have kept much longer in that groove had it not been for the competition of America. He had not the slightest doubt we could produce these articles quite as cheap and as good in England as in America. In the way of castings, America could not surpass us, and it was only necessary that our manufacturers should get out of the old groove, and introduce scientific and mechanical motions into their productions to enable us to outstrip America.

Mr. Corbett also thought one great fault had been that we had got too much into one groove.

Mr. McLeod was of opinion that the existence of store factories in every town was one reason why the Americans were able to turn out such good small castings.

Mr. Heys strongly condemned the want of intelligence displayed by English founders; there were one or two firms in England who could make good castings, but they were the exception. If we could only persuade our founders that they could improve on their existing processes we should have made a great step.

A LARGE HOG.—A hog measuring 9 feet in length, 7 feet 2 inches in girth, and weighing 1,137 pounds, dressed, has been on exhibition at the Continental Market, Broadway, near 32d street. Before killing, the animal weighed 1,390 pounds. It came from Copake, Columbia County, New York.

Recent Progress in Chemistry.

Professor Dewar, F.R.S., Jacksonian Professor in the University of Cambridge, England, lately commenced a course of eight lectures on "Recent Progress in Chemistry," at the Royal Institution, London, where he fills the chair of that science. In his first lecture he dealt with the advances in chemical theory made good by the two main lines of attack on the mysteries of chemical action. These were—first, the hypothesis that matter is constituted of molecules in motion, whose structure and action may be ascertained from the investigation of sensible masses of matter; and the other or modern method, which was based solely on the two fundamental laws of physical action, namely, the conservation of energy and its general tendency towards dissipation. Thus, chemical science, so long statical, had now an extensive dynamical literature, as an admirable example of which was mentioned the lately published work of Professor Berthelot, of Paris, entitled "Essai de Mécanique Chimique, fondée sur la Thermochimie."

The lecturer then proceeded to illustrate the great advance in our knowledge and in our power of manipulation of high temperatures, referring to the immense industrial advantages derived from the introduction of Siemens' regenerator into all chemical manufactures involving the necessity of using furnaces at white heat. He proceeded to show that the recent introduction of magneto-electric machines enabled chemists to examine the interaction of bodies at temperatures far above that of any flame, which never exceeded 3,000°. With this view he showed, for the first time in public, experiments of his own. As an instance may be given his raising a carbon tube inclosed in lime by means of the Siemens electric arc to so high a temperature that the intensely heated part of the tube became changed into graphite, and by passing a mixture of equal volumes of hydrogen and nitrogen through this tube be formed prussic (hydrocyanic) acid by the direct union of carbon, hydrogen, and nitrogen. He thus proved that this exceptional chemical combination is not brought about by any occult electrical effect caused during the transit of the electricity in the arc, but that it is the result of the exceptionally high temperature of the carbon in presence of the gases. The old doctrine of chemical affinity had, in fact, been so far modified as to accord with a mechanical definition, which might be thus formulated: That if two or more compound bodies are capable of reacting chemically to form new substances, then that substance will be formed which, *par excellence*, is attended with the greatest dissipation of energy—*i. e.*, with the greatest evolution of heat.

Further experimental illustrations were given of apparent anomalies in chemical decompositions brought about by the passage of electric currents through fluids. Thus it was publicly shown for the first time that acidulated water, which is readily decomposed into hydrogen and oxygen by the current of a single pair of voltaic cells, was yet seemingly quite unattacked by the passage of the powerful intermittent current of De Meritens' magneto machine, which has a power of, say, 50 cells of Grove's battery. This, it was explained, was due to the superposition of alternate layers of hydrogen and oxygen at the poles something like 300 times every second under the most favorable conditions for chemical recombination. The apparent absence of decomposition could only be explained by the constant interchange of decomposition and recomposition. This was demonstrated by the use of the telephone, which revealed a rapid intermittent current passing through the cell, and further by the continuous rise in temperature of the contents of the cell. The lecturer proceeded to deal with the allotropic modifications of bodies, which branch of the subject he proposes to continue in his next lecture.

Strikes in Massachusetts.

The Eleventh Annual Report of the Massachusetts Bureau of Statistics of Labor, recently presented to the State Senate, contains an account of all the strikes which have occurred during the past fifty years. The total number of strikes and lockouts included in this record is 159. Of these 35 occurred in Boston and its annexes, 14 in Lynn, 10 in Lowell, 9 in North Adams, 8 in Fall River, 4 each in Worcester, Chicopee, and Marlborough; 3 each in Taunton, Natick, and Blackstone, and the remainder scattering through 41 towns. The noticeable facts are brought out that 76 of these strikes were effected chiefly by workmen of foreign birth, and that of these 159 strikes 59 were among textile factory operatives, 34 in shoe factories, and 10 among builders, while the remainder were distributed in small numbers among 25 industries. More than two thirds of the strikes, 109, were unsuccessful. Only 18 are recorded as wholly successful, 6 as partly successful, 16 as compromised, and the result of 9 is unknown. In respect to the causes of strikes, 118 were to secure better wages, 24 to secure shorter days, 9 to enforce trades union rules, 5 to resist employers' rules, and three against the introduction of machinery: The moral of these statistics is pithily presented in three conclusions, namely: "Strikes generally prove powerless to benefit the condition of the wages class; they tend to deprive the strikers of work; they lead to improvidence, and are demoralizing in their effect upon the working man." Reference is made to the strikes in Great Britain and Ireland during 1877–78. They aggregate 468, of which less than 20 were successful and only about 30 were settled by compromise.

MALLEABLE BRONZE.—M. Dronier has patented in Germany a process for rendering bronze as malleable as copper. About 1 per cent of mercury is added to the tin in a warm state, and this is then mixed with the melted copper.