Manufacture and Uses of Bird Lime in Japan.

The following extract, which is taken from the Hiogo *News*, is inserted by Consul Annesley, in his report upon the trade of Hiogo and Hsoka. Although bird lime may be obtained in small quantities in other countries, still Japan may perhaps be considered the only country in the world in which it is regularly manufactured on a large scale, and as an article of some commercial importance, the production of which gives employment to some thousands of people.

The Chinese characters used to express the word "mochi," sometimes called "tori-mochi," to distinguish it from "mochi" (rice cake), give an excellent idea of the nature of the article, and may be freely translated "bird-catching, sticky substance." It was first manufactured at a place called Yoshino, in the province of Yamato, and the manufacture has spread thence over the whole of Southern Japan, being limited in the locality by the habitat of the trees from which the article is made. The date of its discovery it is certainly difficult, and perhaps altogether impossible, to obtain, some placing it 500 years back, and some only 300. It is, however, certain that, within the last twenty years, the quantity that has been brought into the market has been perceptibly affected through the destruction of the trees, by denuding them of their bark for its manufacture. The Japanese have made some attempt to arrest this destruction by leaving, in a particular manner, a certain amount of the bark on the trees, with the hope that they might serve a second time; but it is found that the article made from this second bark is of very inferior quality.

Osaka is the great center of the mochi trade; large stocks of it may be found, anomalously enough, in the hands of the Kane-Cutsaya (dried fruit merchants), who have their headquarters in and about Tema. Its present value is about 13 yen to 16 yen per picul (133⅓ lbs). The best kinds, which are distinguished by being free from bark, of a dull whitish color, extremely viscid, and having a very gummy consistency, come from the provinces of Yamato, Kischin, Tosa, Aiva, and Igo, an inferior quality being made in Satsuma, Chosin, Bungo, Isé, and Mino, the two latter places being the northern limit of its manufacture. All found north of these provinces is imported from Osaka and places south of that port. The best kinds are said to keep good for any length of time. The principal tree from which this bird lime is made is a dark evergreen, having its habitat in the southern half of Japan; it grows high up the shady side of deep mountain glens, and is frequently used by the Japanese as an ornamental shrub; in fact, it may be seen in the ornamental grounds of the Osaka Railway Station. Its bark is of a grayish-brown color, and roughish texture; the leaves are opposite, smooth, dark green, rather more pulpy than the English holly leaf, ovate-acuminate in form, have an unbroken linear edge, a very short petiole, and almost imperceptible stipules. Its efforescence is a panicle, centripetal in its development, having small, white, wax-like diandrous and monopetalous florets, which are also slightly cruciform.

The manufacture of bird lime extends over a period of several months, commencing about June, when the bark of the mochi trees is stripped off and macerated in water for about forty days, after which it is collected and beaten in a mortar, exactly in the same manner in which rice is cleaned. The pestle, however, is of a different make, being shod with iron, the flat under surface of which is armed with spikes projecting downwards. When the pulpy mass under the pestle becomes glutinous, it is taken out and washed in water. This is done to remove as much as possible of the rough outer bark, and the pulp is then again pounded and treated in a cauldron with hot water, on the surface of which it floats. During this treatment it undergoes continual manipulation at the hands of the workman, for the purpose of disengaging the remaining particles of bark, which sink to the bottom of the boiler. This is the most difficult part of process, as considerable skill and experience are required in the workman to keep the stuff from adhering to his hands. After this it is again washed in cold water, and the pounding, boiling, and washing are again repeated until the material becomes sufficiently clean and pure. During the above process about nine tenths of the weight of the raw material is lost, 250 catties of the latter not turning out more than 25 of good bird lime.

The uses to which this article is put by the Japanese are more extensive and diverse than one would suspect, its principal one being, of course, for the snaring of birds and animals. By its means animals as large as monkeys are caught. When they once get the stuff upon their paws they soon cover themselves with it, and so exhaust themselves in trying to get rid of it that they fall an easy prey. Birds also as large as ducks are taken, and by a very ingenious process. The young shoots of the fugi (*Wisteria*), which attain considerable length, and are strong, light, and flexible, are gathered, dried, and knotted together in one continuous length. This is smeared with bird lime, and floated out to sea, when very often in the morning, as the writer has witnessed on the eastern coast of Choshin, the hunter is rewarded with several birds. It is a very inexpensive method of bagging wild fowl, as the tackle will serve any number of times till the bird lime dries, when it is easily replaced. Small birds are caught in various ways, some by means of a decoy bird concealed near a patch of tempting feed, which is plentifully planted with little splinters of bamboo, like large needles, the upper half of which is covered with lime. Others are caught while on trees by means of a long, slender bamboo, the top of which is anointed with the lime, and then stealthily thrust against their feathers. Rats are easily caught by spreading a small quantity on a piece of board or paper, and placing it near their holes. It is spread upon a bamboo leaf, and universally used throughout Japan during summer, for catching flies or other insects. The writer has even seen a flea trap made of it, and used by the Japanese in bed. This trap looked more like an English toast-rack without a handle than anything else, simply a piece of board with the lime spread over its upper surface, while over this semicircles of bamboo were fixed at some distance apart, to prevent the bedding, etc., from getting smeared with lime. Should the vivacious insects happen to get on to this during their noctural frolics, their fate is as surely sealed as that of a little fish in the embrace of an octopod.

Another use of bird lime is for medicinal purposes. In certain diseases of the eye it is taken in small pills or dissolved in hot water. It is also used for those complaints of the pelvis which the Japanese call "senke;" it is considered one of the best cures for flesh wounds, cuts, etc., and is almost universally used in the manufacture of plasters. Both water and oil are used in its manipulation, to prevent it sticking to the fingers, but it is generally handled with a stick. It can be purchased at any greengrocer's ("yawoya") store throughout Japan. It might be as well to mention that a very inferior quality of bird lime is made out of wheat by most of the "fuga" (makers of wheaten food); it soon loses its properties and becomes useless.

THE LIMITS OF NATURAL KNOWLEDGE.

In an address delivered at the Munich meeting of the German Association, by Professor C. von Nägeli, on "The Limits of Natural Knowledge," the lecturer maintained that the solution of the question: In what way and how far may I know and understand Nature? is evidently determined by the answers to three questions: (1). The condition and capacity of the intellect; (2). The condition and accessibility of Nature; and (3). The demands which we make of knowledge. In regard to the capacity of the intellect, were it not for our five senses we would not know at all that there is anything besides, nor indeed that we are in bodily existence ourselves. With regard to the completeness of sensual perceptions there is another boundary which is not generally thought of. Scientific analysis shows that each particle of matter influences and is influenced by every other particle, according to distances. The theoretical possibility, therefore, exists that the human organism may obtain bodily perceptions of all phenomena in Nature. In reality among the beings known to us certain parts have developed themselves into organs of sensation, which are extremely sensitive for certain natural phenomena. As Darwin says, in organic Nature only such arrangements attained full development which were useful to the individual bearer. We are endowed, for instance, with great sensitiveness for temperature; it is necessary for our existence, otherwise we might perish through cold or heat without knowing it. We are very sensitive towards light; it acquaints us in the best and quickest manner with all objects which surround us and which may be useful or dangerous to us. On the other hand, we are not organized to perceive the electricity which surrounds us; and were it not for accidental experiences, which revealed it to us, we should have no idea of that force which undoubtedly plays the greatest part in organic and inorganic Nature. Our senses are indeed only organized for the requirements of our bodily existence, but not to satisfy our intellectual cravings. We cannot rely upon our sensual perceptions acquainting us with all the phenomena of Nature.

There are, therefore, two important limits to our perceptions of Nature. On the one hand we are probably deficient of the power of sensation for whole domains of natural life; and on the other, as far as we really have this power, it is confined in time and space to an insignificantly small part of the whole. By conclusions from facts which were recognized by the senses, we arrive at facts equally certain which can no longer be perceived by the senses. The hope of conquering the entire domain of Nature by the reason can, however, never be realized. As the effect of a natural force decreases with the distance, the possibility of knowledge also decreases as the distance of space and time increases. The confined capacity of the intellect, therefore, allows us only an extremely fragmentary knowledge of the universe.

In passing to the second question, we find that the difficulty which Nature opposes to human knowledge is her endlessness of time and space, and of everything which depends on this as a necessary consequence. We cannot conceive her as a whole, because a process of conceiving which has neither beginning nor end does not lead to conception. On all sides uninvestigable eternity bids the investigation categorically to stop. As soon as man wishes to overstep this domain, and wants to form some conception of the whole, he falls into absurdities. Whenever our finite reason wishes to raise itself to conceptions of the eternal in however logical a manner, its wings become paralyzed, and, like a second Icarus, before the sunny heights are reached it falls back into the depths of finite and obscure ideas.

The third question regards "the demands which we make of knowledge." As all conceptions which we form of Nature are exclusively the results of sensual perception, our knowledge cannot go further than to compare the phenomena we have observed, and judge them with reference to one another. We understand something perfectly if we create it ourselves because in this case we see its cause. The only thing in the domain of knowledge which, based upon our sensual perceptions, we can accomplish, is mathematics. We can also understand real things with certainty, as far as we find mathematical ideas realized in them. Our knowledge of Nature is therefore always a mathematical one, and consists either in simple measurement, as in the morphological and descriptive natural sciences, or in casual measurement, as in the physical and physiological sciences. To understand a natural event means nothing else, as it were, than to repeat it in thought, to reproduce it in our mind.

We can thus only know what our senses acquaint us with, and this is limited in time and space to an infinitesmal domain. Of all that is endless or eternal, of all that is stable or constant, of all absolute difference, we have no conception. Of that with which we are acquainted at all we can only know what is relative and differs by degrees, because we can only apply mathematical ideas to natural things. Professor Von Nägeli sums up in the words: "We can only know the finite, but we can know all the finite which comes within reach of our sensual perception."

New Inventions.

An automatic fan and fly brush has been patented by J. B. Boone, of Galveston, Texas. It consists of a fly brush attached to a shaft with rotary-reciprocating motion communicated to it by a clockwork device. The spring has strips of paper attached to it and fans are affixed to the revolving shaft which works in a supporting plate attached to the ceiling.

John W. Drake, of Toronto, Ill., has invented an improved lamp shade and reflector. The shade has a conical top section and a lower supporting section of inverted conical shape. The lower section has at one side a large opening for the exit of the light, which opening may be enlarged or diminished by ring-shaped sections. At the opposite side of the of the lower section is arranged an adjustable and detachable reflector, for throwing the light through the opening of the shade. A strong light can thus be thrown to any point.

An insole patented by J. K. Gittens, of Brooklyn, N. Y., consists of sheepskin with wool for the inner layer, heavy paper for the intermediate layer, and heavy japanned drilling for the outer layer, gummed together, and bound with a worsted or silk binding. It does not wrinkle.

Mr. Frederick Becker, of Hokah, Minn., has devised a new window shade in which thin strips of wood are connected together, tilted to shut out or admit more or less light and raised by cords passing over pulleys or rollers near the top of the window.

An instrument for cleaning telegraph wires, patented by Joseph Walsh, of New York city, consists of a long tube fitted with knives and springs. When it is placed around the wire and moved along, the device cuts away all obstacles such as kite strings, and clears the wire.

A Tap Attachment to Beer Barrels has been patented by J. H. Bruns and Henry von Dehsen, of New York city. It consists in an externally threaded cup which screws into the barrel head. The cup has an apertured bottom, into which is screwed a faucet, which is threaded at its outer end, to receive the coupling by which it is connected with the counter beer faucet. The plug of the faucet is placed midway in the cup and is moved by a pin. The cup has a screw cover, which when removed and the plug turned permits the beer to pass.

Owen W. Taft, Brooklyn, N. Y., has patented a Bird Cage. It consists in a bird cage body made in detachable parts and arranged to be held in its complete integral form by a tension exerted either individually or collectively upon the several wires constituting the same. In practising the invention, numerous modifications of the same may be made all tending to the same result, but the preferred form is that in which each wire has formed in the same a spiral coil which gives an individual tension for each wire to hold the detachable cap piece, standards, and base ring together, to form a complete bird cage body.

Sylvester Root, of Kentland, Ind., has invented a Fire Escape, which consists in an apparatus so constructed that persons may be lowered from a building to the ground by means of a chain or rope, and the latter will then be automatically drawn up again to facilitate the descent of other persons. The means employed consist of the chain with waist belt attached, a drum for winding and unwinding the chain, and spring power and brake apparatus for regulating the action of the drum.

A Chair Seat and Back has been patented by Paul Rath, of Jersey City, N. J. It consists of a molded pasteboard seat or back, having a central hole, stuffing, and covering, in connection with a separate pasteboard section bolted thereto, and carrying auxiliary springs, to increase the elasticity of the stuffing. It furnishes a light and useful seat.

A Bougie invented by Stephen St. John, of Port Jervis, N. Y., consists in a compound of gelatin or isinglass and glycerin, thoroughly mixed together in proportions varied accordingly to the quantity of the ingredients and the requirements of the species and intensity of the disease. The compound thus made is then formed into cylinders, and medicated to suit different purposes.

A Dress Elevator has been patented by Emil C. Calm, of New York city, by which the dress may be supported at any elevation, and adjusted with great facility. It consists of the connection of the hook by which the dress elevator is attached to the belt, and of the chain to which the dress-holding clamp is applied, of a pulley or other guide device connected to hook, and of a suitable chain-retaining device.

Imitation of Wood Mosaics.

Hugo Riha describes the following neat method of imitating mosaics in wood: The smooth pine board is painted with three or four coats of dull white for a ground. When dry it is ground with *ossa sepia*, well dried with a piece of buckskin and left a day standing. A thin liquid paint is made by grinding the finest ivory black with turpentine on a glass plate, very fine, and mixing thoroughly with a mixture consisting of three parts of ordinary copal varnish and one part turpentine. This is applied evenly, with not too stiff a brush, upon the white tablet, and graded down very fine and delicately with a badger's hair grader. After two hours the paint dries so solid that work may be begun on it. The tablet is placed on an inclined position and the drawing of the design, the outlines of which have been pricked through the paper with a needle, is laid upon it, and reproduced on the black surface by striking it gently with a bag filled with finely ground chalk, and after removing the paper the outlines will be found in white upon the black background. The design is next painted over with a solution of calcined soda. In two or three minutes afterwards the painted part is washed with a piece of sponge dipped in water, with a circulatory motion of the hand and arm. With a little rubbing the black paint is removed from the portions where the soda was applied. The washing with clean water and sponge is repeated until the design appears in white. This, of course, is the white ground that was under the black. This surface is then dried with a piece of buckskin. By this process the white portion is depressed while the black portion which did not come in contact with the soda remains raised. The colors are now applied to the white portion to imitate the different kinds of wood; and where two kinds of wood are to be matched together, a strip of adhesive paper is pasted along the line where they are to meet, and one kind of paint applied up to the paper. When dry the paper is removed and placed over the painted part and the other color applied. When the design is completed it may be varnished and polished. As the paint applied does not form a thicker coat than the black which surrounds it, the work has the appearance of natural wood mosaic inlaid in a black groundwork, instead of being raised from it as in the usual method.

Making Wrought Iron and Steel.

In a paper on the direct process of making wrought iron and steel read before the Franklin Institute, Mr. Charles M. Dupuy recently gave many interesting facts, from which we make selections.

Forged iron is made by the "direct" and "indirect" methods. By the primitive direct method 400 or 500 lbs. of ore, mingled with charcoal, are subjected to the action of blast for 3 or 4 hours, when it becomes imperfectly matted together, and is transferred to the hammer, where its earthy impurities, being melted, are removed by pressure. This process secures a high grade of iron, at a cost of about 300 bushels of charcoal and great waste of ore to the ton of iron. The "indirect" method treats large masses of ore, carbon and fluxes in the blast furnace. The earthy impurities are mainly tapped off, but still the pig iron may be said to be a compound of iron, carbon, silica, and other substances which require a second melting, and laborious manipulation to purify the metal for forging or rolling.

The devices for improving and cheapening iron by the direct method have been numerous, for the superiority of the metal thus treated had been observed. In 1791 Samuel Lucas patented a process for reducing ores with carbon in airtight pots, and in 1794 Mushet forged iron which he had reduced in a crucible. The simplest method, by reduction of ores in crude clay pots, seems to have been known from the earliest times. A fresh pot for every operation was, of course, too expensive, and devices have been invented by which ore could be deoxidized and the vessel used over and over again.

In a long series of experiments on iron reduced in close pots, Mr. Du Puy found that ore and carbon are such perfect non-conductors that the highest heat penetrates from the outside very slowly through a thickness of about 3 inches of this substance, and that to add 2 or 3 inches thickness of crucible, or containing vessel, practically defeats complete reduction in a sufficiently speedy time to be successful. He also found that a white welding heat was necessary to thoroughly reduce the ore. Crucibles of any refractory material sufficient to withstand this heat are costly at first, and in frequent renewals; besides the material would soften, and incorporating with the metal, deteriorate it. To secure the advantages of the "close pot" it became evident that some substance should compose it that should withstand the high welding heat, and be homogeneous with the metal, and finally, when its work was done, and the ore changed to metal, would weld up with it.

As it is estimated that every pound of silica ordinarily carries with it about three pounds of iron, it occurred to Mr. Dupuy to create for the silica a greater affinity than it has for the metal, by mingling alkalies, and to so proportion them, that the glass thereby produced by not combining with it, should not only save the iron, but that it should be further utilized by forming particles of glazing or varnishing material, covering the little particles of metal as formed, and thus protect them from furnace reoxidization. This step proved effective. Now the alkalies in quantity, and kind, having been determined by an analysis of the ore, they are mingled with it along with the carbon, and are all pulverized together, by being thrown, in the proper proportion, into an ordinary Chilian mill, such as is used in Western rolling mills for grinding the "*fix*," and from thence shoveled at once into the canisters, and charged into the furnace.

It will be observed that a triple chemical operation begins to take place at once, from the moment the canisters are charged into the furnace.

First. The oxygen of the ore combines with the carbon, passing off as carbonic oxide.

Second. The silica and alumina combine with alkalies introduced, and form the glazing material which cover the particles of newly made metal, effectually sealing these particles from reoxidation from the furnace gases.

Third. The phosphorus melts into this glass, and passes off with it as a slag, not contaminating the iron.

If it is desired to make steel, the canisters, filled as described, are charged on end into the furnace on a layer of coke, a few inches in thickness, so as to allow the heat to penetrate from the bottom, as well as sides and top. They are usually placed 7 or 8 inches apart to secure a radiation of heat between them.

In the course of from five to seven hours, according to the strength of the heat, the ore will be reduced from its oxide and settle down into almost a solid metallic mass, so firm as to be separated and broken with great difficulty, even in its highly heated state in the furnace. In this solidified condition it is removed and hammered, or thrown into the squeezer and rolled to muck bar, at this one first heat. It is then cut up, reheated and piled, with the usual loss of 8 to 10 per cent of ordinary piled iron. This stock is then fitted for the steel pot, producing all grades of steel, up to the highest, without mixing with other stock, but by simply varying the carbon.

If iron is required, as soon as the metal has separated from its impurities, precipitated to the bottom, and covered with slag, the operator at once rolls it up in balls and subjects it to the hammer or squeezer. No excessive labor is required in stirring the metal, as is required to decarbonize pig iron, for this metal has been deoxidized without labor, simply by the chemical action of heat on the material; and there is no excess of carbon to eliminate. It has also separated itself, in the liquid state, by specific gravity, from its metalloids altogether, without the aid of physical labor. Finally, as it lies at the bottom of the furnace, it is incorporated with just sufficient carbon as is needed by the operator to produce the grade of metal required.

The ore, carbon, and fluxes, as has been proved by working, may all be ground together and charged into the canisters at an outside cost of 40 cents per ton of ore; when systematized, 30 cents per ton will be sufficient.

It will be found that muck-bar may be produced a few dollars per ton above the cost of pig iron; that it will rank with the highest grades of wrought iron for special purposes; and that the plant is so simple and inexpensive, as to make a large reduction in the interest account of all ironworks. Besides this, it will be found that the process is so greatly under the control of the operator, as to enable him to make such mixtures as to produce the exact quality of iron or steel desired, not being subject to the irregularity of the blast furnace. This direct process, in a word, reduces the exact results of the laboratory to a large and intelligent practical working basis for the manufacture of iron and steel.

Astronomical Notes.

BY BERLIN H. WRIGHT.

PENN YAN, N. Y., December 22, 1877.

The following calculations are adapted to the latitude of New York city, and are expressed in true or clock time, being for the date given in the caption when not otherwise stated.

PLANETS.

Mercury sets	5 56	evening
Venus "	8 18	"
Mars in meridian	6 18	"
" sets	0 30	morning
Jupiter "	5 21	evening
Saturn in meridian	5 1	"
" sets	10 33	"
Uranus rises	9 15	"
Neptune in meridian	8 6	"
" sets	2 50	morning

FIRST MAGNITUDE STARS.

Sirius rises	7 32	evening
Procyon "	7 7	"
Betelgeuse "	5 16	"
Regulus "	9 11	"
Aldebaran in meridian	10 22	"
Vega sets	9 21	"
Altair "	8 8	"
Fomalhaut sets	8 45	"
Capella in meridian	11 0	"
7 stars (cluster) "	9 33	"

REMARKS.

The sun entered the constellation *Sagittarius* and attained his greatest southern declination (23° 7′ 26″) December 21. Twilight begins in the morning at 5 h., 42 m., and ends in the evening at 6 h., 14 m., having lasted in both instances 1 h. 39m.

All the planets are advancing or moving eastward among the stars. except Uranus and Neptune, which are retrograding. Mercury is now brightest, and can be seen in the west in early evening. He sets 1h. 25m. after the sun, and almost at the same point in the horizon (¼° south). He is between Venus and Jupiter, having almost the same declination as the latter and setting 35 m. later. His color will serve to distinguish him from Jupiter and stars. Only 0·226 of Venus' illuminated disk is visible, yet on a clear moonless night she will now cast a well defined shadow.

White and Colored Troops.

The recent annual report of the Surgeon General gives some figures in regard to the health of the army during the fiscal year ending June 30, 1877, which are interesting. The average mean strength of the army was 23,284 white men and 2,075 colored men. Among the white troops the total number of cases of all kinds reported as taken on the sick list was 40,171, or, taking the average, each man was sick less than twice a year. The average number constantly on sick report was 1,026, or about one twenty-second part were sick all the time. The total number of deaths was 260, making the proportion of deaths from all causes one in one hundred and fifty-five. Among the colored troops the total number of cases was 4,348, or each colored man was sick on the average more than twice a year. The average number constantly sick was 99, or about one twentieth. The number of deaths was 32, or one in one hundred and thirty-six. Comparing the ravages of disease among the two races, we find that 1,482 per 1,000 strength of white men suffered, against 1,821 per 1,000 strength of colored men, the proportion be ing about 20 per cent against the latter. In deaths, however, we find the proportion reversed, for only 7 per thousand of colored men died of disease, as against 8 per thousand of white men. In cases caused by wounds, accidents, or injuries 8 per thousand negroes died, against 3 per thousand of white men. It thus appears that the negroes become diseased more easily than white men, and also recover more easily; but when actual bodily injury occurs they die more than twice as fast as white men.

It is easy to follow out this line of thought in case of actual warfare. The negro troops would be more subject to sickness and when wounded would die quickly. The white troops would be less liable to succumb to disease, though when afflicted the percentage of recovery would be against them. But on the other hand they would recover more easily from their wounds, which are after all the most serious troubles to be met with in war. Disease can be guarded against, but wounds can not. The superiority of the white to the colored soldier would thus seem to be in measure a proved on the score of health alone.

Heat Waves.

Professor Piazzi Smyth, of the Royal Observatory, Scotland, says that the coming winter is to be exceedingly cold. From the observations of earth thermometers over a period of 39 years, he finds that between 1837 and 1876 three great heat waves from without struck Great Britain, namely: The first in 1846·5; the second in 1858—0, and the third in 1868·7. The next one will probably come in 1879—5, within limits of half a year each way. The periods of minimum temperature, or greatest cold, are not in the middle time between the crests of these three heat waves, but are comparatively close up to them, on each side, at a distance of about a year and a half. Hence the next cold wave is due at the end of the present year, and very frigid weather may be looked for.

NEW BOOKS AND PUBLICATIONS.

WHITWELL'S IRON SMELTER'S POCKET ANALYSES BOOK. By Thomas Whitwell. John Wiley & Sons, Publishers. New York. Price $2.

The want of a pocket analysis book, properly prepared for the various materials used in an iron or steel works, or by the metallurgical engineer will be fully supplied by this choice little work. It contains tables of specific gravities, proportion of weights, melting, boiling, circumference, English and French weights, and other tables of use to the furnace owner or engineer. It is designed for the pocket, and contains room for 450 analyses; its value will increase with the use made of it.

THE CHEMISTS AND DRUGGISTS DIARY. Publishers: 44 Cannon street, E. C., London, England.

This is a volume of great value to chemist and druggists. It contains a dictionary of chemical synonyms, a list of poisons and antidotes, mineral waters, books interesting to pharmacists, a directory of London hospitals. addresses of London doctors, and a dictionary of minerals. Also acts of parliament affecting druggists, botanical calendar and a large diary with ample space for every day in the year. A similar work for the profession in this country would undoubtedly be appreciated.

THE WATER SUPPLY OF SOUTH AFRICA. Compiled by John Croumbie Brown. LL.D. Oliver & Boyd, Publishers, Tweeddale Court, Edinburgh, Scotland.

Mr. Brown has already published valuable works with the philanthropic object of exhibiting the bad results arising from forest destruction and the positive advantages to be gained by tree culture. He has entered with much detail into the effects of forests upon rainfall, and in another work he has exhibited the benefits of the plan pursued in replanting the Alps and other mountains of Europe with trees and bushes, the object being to arrest and prevent the destructive consequences of torrents. In the present volume he has gathered a large amount of material showing the why and wherefore of the desiccation of South Africa, and pointing out the appropriate means for reclaiming the country. These means, it is considered are irrigation, arboriculture and an improved forest economy, or the erection of dams to prevent the escape of a portion of the rainfall to the sea, besides other means of minor importance. A very large number of authorities are cited and the subject is treated with great minuteness.

THE LAW OF PATENTS, TRADE MARKS AND COPYRIGHTS. By Orlando L. Bump. Baker, Voorhis & Co., Publishers, 66 Nassau street, New York. Price $6.00.

This is a very complete compendium of the law as contained in the Revised Statutes of the United States. Notes are given under each section referring to decisions of the courts and the Commissioner of Patents. A valuable table is added, showing the time of the repeal of each act, and other information, so that a lawyer may readily ascertain whether a provision in a statute cited in a decision is still in force, or whether a statute has been so modified as to affect the application of a decision. The rules of practice of the Patent Office and a large collection of forms are appended. Nearly 2,500 cases are referred to and digested, and it is believed that, what with the information contained in the book itself, besides that attainable through its very copious references to original sources, the reader will be furnished with all likely to be required in the investigation of any subject under the laws.

A MANUAL OF VEGETABLE PLANTS. By Isaac J. Tillinghast. Tillinghast Brothers, Publishers, Factoryville, Pa.

This is a neat volume of 100 pages containing the experiences of the author in starting all those kinds of vegetables which are most difficult for a novice to produce from seeds, with the best methods for combating and repelling noxious insects and preventing the diseases to which garden vegetables are subject. It is a handbook of much value to gardeners and embraces a variety of useful information.