THE OLEO-MARGARIN INDUSTRY.

The manufacture of artificial butter, if it has not already reached the status of an important industry, certainly bids fair to take that rank before long. It has already attained a forward stage of development, which is shown by the fact of its having become specialized. The production of oleo-margarin is distinct from the butter manufacture; and in the future, while the former will be carried on by large establisments where great quantities of fat can by special machinery be treated cheaply and with uniform results, the churning of the oil with the milk, and the subsequent processes necessary for its conversion into butter, will be the work of probably numerous small factories.

The details of the butter making are all embodied in an elaborate article by Dr. Henry A. Mott, of this city, which were published, with illustrations, in the Scientific American Supplement some time ago, and they therefore need not be recapitulated here. Our object in the present article is to direct attention to the wholesale production of oleo-margarin, as carried on in this city, its growing commercial importance, and the secret of its successful manufacture, as recently demonstrated by the original investigations of Professors Chandler and Adams and Dr. Mott.

We were afforded an opportunity of examining into the details of the industry at the factory of the Commercial Manufacturing Company, where some eighty thousand lbs. of fat are daily converted into oil, about all of which at present is exported to Europe. Fat of all kinds is utilized, provided that it is perfectly sweet and clean; and to insure this, the material on its reception is thrown into huge tanks and there thoroughly washed and minutely examined. Doubtful portions are at once rejected, and taken elsewhere in the factory, to be rendered into tallow. The clean washed fat, cut in suitable pieces, is then carried to an upper story and fed into chopping machines, whence, in a finely hashed, pulpy state, it runs at once into huge kettles of a capacity of 2,300 lbs. each. Upon the temperature at which it is melted in these receptacles depends the whole success of the process; and to this end the heat is never allowed to rise above 120° Fah. Upon the experiments, and other considerations touching this point, we shall dwell in some detail further on. About two hours are consumed in the melting, during which process salt is added; and then the liquid, which meanwhile is constantly stirred by mechanical means, is conducted to settling kettles, where membrane and other impurities are deposited. From these vessels, while still hot, the "stock," as it is termed, is drawn off in cans and carried to the "seeding" room. Here the material is allowed to cool, when it becomes of about the consistence of tallow; but it possesses a very apparent grain, being in this respect totally different from tallow, the prominent characteristic of which is the entire absence of anything akin to granulation. In this state, the fat goes to four workmen who stand beside a four-armed revolving table. Workman No. 1 adjusts a cloth to line a shallow box on the extremity of one of the arms; workman No. 2 fills the cloth with stock; workman No. 3 folds the fabric over, and workman No. 4 removes the package ready for the press. In the establishment we visited, there were eight huge hydraulic presses, each capable of holding several dozen filled bags at once, and of applying a pressure, if necessary, of 500 tons to the ram. The usual working pressure is about 300 tons, under which the pure clear oil, or oleo-margarin, is freely squeezed out, and runs directly from presses to the lower floor, where it is drawn off into tierces.

There are various minor points in the process which we have here outlined, notably the straining of the oil or stock before it enters the cans for the seeding room; the necessity of keeping that department at a constant temperature of from 80° to 85°, etc., which we shall not stop to consider. One important advantage, however, is that in the manufacture there is no waste. The refuse fat, or any stock which becomes, even in the least appreciable degree, tainted is at once rendered into tallow, for which there is always a good market. The contents of the bags, after the stock is pressed, are a fine quality of pure stearine, readily purchased by candle and soap makers; and finally the scrap, after the tallow rendering, is valuable as a fertilizer, and is sold at about half a cent a pound for that purpose. Even the edges of the stearine cakes, which yet contain a little unexpressed oil, are sent back to the melting tanks, in order that that fraction may be saved; and the cloths in which the stock is packed during pressing yield, while being cleansed after each use, several hundred gallons of oil a day, which goes, however, on account of its being charged with impurities, to the tallow and not to the melting kettles.

The oil, as it enters the tierces, is perfectly pure, limpid, and sweet, and possesses a slight buttery odor. On becoming cold, it congeals into a hard, yellowish-white mass. Butter was exhibited to us, prepared from fresh oil, which was not distinguishable from the genuine article, and which was undoubtedly superior in quality to the average butter sold in the markets at this time of year.

Dr. Mott, in the article which we published recently, presented a careful *resumé* of all the various patented processes bearing on this subject of artificial butter making; and he pointed out very clearly that the only successful means which has been discovered is that invented and patented by Hippolyte Mège. Mège, it appears, discovered first that, to produce from the fat the necessary granulated material, a low temperature of melting is necessary, while a high one is destructive; and secondly, he devised the method of converting oil into butter by churning it with milk. The corroborating investigations of Drs. Chandler, Adams, and Mott leave little question but that Mège's discoveries bear as important a relation to artificial butter making as do the eye-pointed needle and feed motion to the sewing machine; and that, like the latter, it is hardly possible to produce the one any more than successfully to construct the other without the employment of these fundamental creations. Consequently, herein lies the cause of the failure of the various compounds which from time to time have been offered to the public, but which were not produced according to Mège's process. The record of Dr. Chandler's experiments shows a very extended investigation both into the past literature of the subject and into actual conditions in order to discover whether, by any other mode similar to that described by Mège, a like product could be obtained. The gist of Mège's idea is in these words: "My observation is that 125° Fah. is about as high as the heat can be raised safely in the melting kettles. Professor Chandler heated a sample to 150° Fah.; and although the resulting product was carefully subjected to the regular processes, it possessed a disagreeable and offensive odor, which could not be eradicated. Fat heated to 143° and 130° yielded similar results. A trial was made wherein the heat was raised to 230°, and this product was worse than any. In fact, Dr. Chandler concludes that the higher the temperature, the inferior the product; and so narrow is the dividing line that, while melting at 123° yields good results, melting at 130° produces altogether bad ones: while nowhere does it appear that Mège's process has been anticipated. Dr. Chandler also states that he finds oleo-margarin butter "to be a good and wholesome article of food, and equally as free from injurious effects as the butter made from cream." Professor Adams' experiments were made simultaneously with those of Professor Chandler, and his results and conclusions are substantially the same. In order to verify the conclusions of both of the above eminent chemists, and at the same time to reach some further details as to the conditions of investigations, etc., Dr. H. A. Mott has recently conducted a series of separate researches embodying four sets of experiments, in each of which from 400 lbs. to 500 lbs. of fat, prepared by washing, etc., were used. The results of his experiments are as follow.

The object of experiment No. 1 was to note the effect of heating the fat to 160° Fah. This temperature was reached in 1 hour and 47 minutes; and the fat was allowed to remain thereat for 9 minutes. It was then allowed to rest in order to get a separation of the membrane. The refined fat, on being drawn off, was allowed to cool in a room at 85° Fah., and then packed in bags and subjected to the usual pressure. Its disagreeable odor and taste were strongly marked; and when converted into butter, the latter was manifestly unfit for food. The sample exhibited to us by Dr. Mott plainly shows this, as it is evidently nothing but colored tallow.

In experiment No. 2, a temperature of 150° was reached in 1 hour and 38 minutes, and the fat held thereat for 10 minutes. Subsequent treatment was the same as the foregoing, and the results were apparently identical. In experiment No. 3, the fat was heated to 140° in 1 hour and 34 minutes, and kept thereat for 16 minutes: with similar results. Finally in experiment No. 4, where but 130° was reached, in 1 hour and 27 minutes, and maintained for 11 minutes, no improvement on the foregoing was found. In every case the fresh oil had an unmistakable tallowy odor, which, after a few days, became exceedingly offensive. On the other hand, as we were shown by the samples, butter prepared from fat treated at the same time, at a temperature below 120°, was sweet and fresh. Of course the *rationale* of the discovery is simply that, at a certain point, the stearine is acted upon by the temperature in such a way that, when the liquid congeals, the stearine no longer crystallizes; and instead of the grainy feeling, very palpable on drawing the finger through the partially congealed material, there is merely the unctuous smoothness of common tallow.

There is nothing about the process of making the oil which need excite the prejudice of a fastidious taste. Perfect cleanliness is necessary to the proper production of the material, and therefore must be maintained. As regards the butter made from the oil, it is chemically butter, and not tallow. This is clearly shown by the following analyses—selected out of a large number of equally favorable ones—made separately by Drs. Brown and Mott:

Constituents.		Artificial butter (Brown).	Artificial butter: average of 2 analyses (Mott).	Cream butter (Mott).	Same as last calculated to 5·225 per cent of salt.
Water		11·25	12·005	12·29	11·827
Butter solids		88·75	87·995	87·71	88·173
		100·00	100·000	100·00	100·000
Fats	Olein, Palmitin, Stearin, Butyrin, etc.	87·15	82·025	86·01	82·765
Casein		0·57	0·745	0·19	0·183
Salt		1·03	5·225	1·51	5·225
Coloring matter		trace	trace	....	....
		88·75	87·995	87·71	88·173

Besides the use of oleo-margarin for the manufacture of artificial butter, it finds another extensive channel in the manufacture of cheese. The skimmed milk is placed in the usual cheese vat, and heated to 92° Fah., when the oleo margarin, in a fluid condition, is added and stirred for from three to five minutes, or until an emulsion is formed, when rennet is added, sufficient to cause coagulation in from 8 to 10 minutes, and thus the oil added is made to enter into the composition of the curd. The curd is then cut and worked in the usual manner. The Hon. X. A. Willard, Professor Caldwell, and others have stated that the cheese produced is very palatable, and makes a good, healthful article of food.

Factories similar to the one we visited are now established in Cincinnati, Chicago, St. Louis, Providence, Philadelphia, Bethlehem, Pa., Baltimore, and various other localities. All work under the Mège patent, which is owned by the United States Dairy Company, an association of wealthy capitalists of this city. No great quantity of the butter made from oleo-margarin reaches our markets, as, as already stated, the principal consumption of the oil is in Europe. From across the Atlantic, we are informed that the demand is constant; and although the establishment in this city has been in operation but a few months, the extent of its production is now only limited by the difficulty of obtaining the one million lbs. of pure and suitable fat necessary weekly to utilize the full capacity of the works. One hundred and twenty men are employed in the factory, which has been running day and night since June last.

Preparing Cod Fish for Market.

A correspondent of the *Montreal Gazette* gives the history of a cod fish from the moment when, on the hook of the fisherman, it is dragged from its native element till it disappears down the human throat on the banks of the Amazon, the Parana, the Tagus, or the Po: "After a few expiring wriggles—and it is a comfort to be informed by naturalists that fish are almost insensible to pain—the cod is flung from the fisherman's boat upon the rough stage, where it is received by the 'cut-throat,' who, with a sharp knife, lays open the fish across the throat and down the belly, and passes it to the header. This operator proceeds to extract the liver, which is dropped into a vessel by his side, to be converted into codliver oil. He then extracts the entrails and wrenches off the head, and throws these into another receptacle, to be preserved for the farmer, to mix with bog and earth, thus forming a most fertilizing compost for his fields. The tongues, however, are taken out, and also the sounds, and these, fresh or pickled, are an excellent article of food. The fish is then passed to the splitter, who, by a dexterous movement, cuts out the backbone nearly to the tail, and thus lays the fish entirely open, and capable of being laid flat on its back. This is the nicest part of the operation, and the splitter always commands higher wages than the rest of the operators. The salter next takes the fish and washes it well from all particles of blood, salts it, and places it in piles to drain. After laying the proper length of time it is washed, and spread to dry on the 'flake,' which is formed of spruce boughs, supported by a framework resting on upright poles. Here the cod are spread out individually to bleach by exposure to sun and air, and during this process require constant attention. At night, or on the approach of rain, they are made up into little round heaps, with the skin outward, in which state they look very much like small haycocks. When the 'bloom,' or whitish appearance, which for a time they assume, comes out on the dried fish, the process is finished, and then they are quite ready for storing. On being conveyed to the premises of the exporting merchant, they are first 'culled,' or assorted, into four different kinds, known as 'Merchantable,' 'Madeira,' 'West India,' and 'Dun,' or broken fish. The first is the best quality, the second a grade lower, the third is intended for the stomachs of negroes, and the fourth, which is incapable of keeping, is used at home. The cod sent to hot countries are packed by screw power into small casks called 'drums;' those which go the Mediterranean are usually exported in bulk. Large quantities of dried cod fish are shipped to Brazil, and there is hardly an inhabited corner of that vast empire where the Newfoundland cod is not to be found, being carried on the backs of mules from the seacoast into the most distant provinces of the interior. The negroes of the West Indies welcome it as a grateful addition to their vegetable diet. To all parts of the Mediterranean it finds its way, Italians, Greeks, and Sicilians equally relishing the produce of the sea harvest. The Spaniards and Portuguese are our best customers, and all over the sunny peninsula the 'bucalo' is a standing dish. In the warmer regions of the earth the people seem to have a special liking for the dried and salted cod, and to them it is an almost indispensable article of food."

A Wonderful Species of the Cotton Plant.

A cable despatch from London to one of our daily papers says: A remarkable discovery has been made in Egypt by Signor Giacomo Rossi, Austrian Consular Agent at Alexandria. He has found a new cotton plant, which is so wonderfully prolific that it may prove a dangerous enemy, the report says, to the American cotton raising interests. Signor Rossi, in his report of the discovery, says that about two years ago he accidentally came across the new plant on the property of a captain in the Menulia District, who collected the seed and sold it to his neighbors at twelvefold the price obtained for the ordinary kind. The plant has a long stem, and being without branches much space is saved. It bears on an average fifty pods on each bush, while the usual yield of the plant is about thirty. A smaller quantity of seed is needed, but the great drawback in Egypt is that it requires much more water, which necessitates the alternating of the crops with grain and vegetables. In the sea islands of the Atlantic coast, or along the lower Mississippi, it would prove wonderfully prolific.

The Analogy of Sound and Light.

The Saturday evening free lecture in connection with the Loan Collection of Scientific Apparatus at South Kensington was lately given by Professor Barrett, of the Royal College of Science, Dublin, on "Some Experiments Illustrating the Analogy of Light and Sound."

The Professor commenced by referring to some of the well known facts about light and sound, such as that sound waves travel through air, while light waves travel through luminiferous ether, etc. Among many illustrations of the rate at which each travels, he gave this as a very intelligible one: If a cannon were fired in London the sound would take about eight minutes to travel to Birmingham, a little over one hundred miles, while in the same time the light from the flash would have traveled to the sun, a distance of over ninety millions of miles. But, though they so differ in the rate of progress, both light and sound show many phenomena in common.

In the experiments made during the evening the sensitive flame was used as a detector of sound. This delicate acoustic reagent, familiar to London audiences through Professor Tyndall's lectures, was first, we believe, discovered in 1866 by Professor Barrett, though he modestly did not allude to the fact. Indeed, most of the experiments shown during the evening formed the subject of a paper read by him before the Royal Dublin Society in January, 1868, and the discovery of the ratios referred to at the end of the lecture was announced in the *Quarterly Journal of Science* for 1870. The performance of the experiments, however, was entirely new to a London audience.

The analysis of the phenomena of light and sound were illustrated in the following order: 1. Both light and sound get feebler as they leave their source of origin. In the case of sound this was shown with a loud ticking watch and a sensitive flame. 2. In reflection the angle of incidence is the same as the angle of reflection. In the case of sound, this was shown with the sound of a whistle sent along a tube, and reflecting along another placed at an angle to it from a reflector placed at the end where they approached. The distance to which a feeble sound might be reflected perceptibly from a concave mirror was shown with mirrors over thirty feet apart. 3. With refraction, in the case of light, familiar convex lenses were used; and in the case of sound, analogous but less familiar lenses of gas of a different density from air were used. A collodion balloon, filled with carbonic acid gas, served as a double convex lens, and its action was manifested by the concentration of sound from the ticking watch on to the sensitive flame. 4. Both light and sound suffer absorption in passing through non-homogeneous media. Professor Tyndall's apparatus, showing the "echoing back" of sound in passing through successive alternating layers of gas of different densities, is now well known, and every one is familiar with the fact that, though light may traverse a vessel of clear water, it can no longer travel when it is filled with bubbles of transparent air. 5. There is an analogy between the sympathy among the same notes of a gamut and the sympathy among individual colors in the spectrum. An incandescent body that produces a particular bright band in the rear of the spectrum will, when in a gaseous state, absorb light, and cause a dark band in exactly the same part of the scale. Tuning forks, wires, or columns of air in jars are responsive to vibrations produced by others exactly in unison, but only to those. This was shown in various ways in a very clear manner. 6. An analogy, which Professor Barrett called a more fanciful one, was spoken of. All the complex music of an orchestra is the result of a few simple notes variously combined. So all the tints of a picture are the results of a few simple colors variously combined. The musical scale sorts the complex notes in one case, the spectrum sorts the complex colors in the other. Professor Barrett, taking Professor Listing's determination of wave lengths, has made a most interesting comparison. The wave lengths of the notes of the gamut he expresses not in absolute but in relative measurement. Thus C is taken as 100, and all the other notes have their wave lengths expressed in percentages. Similarly, red is taken at 100, and the wave lengths of other colors are expressed in percentages. This interesting result comes out in comparing the two columns. D and orange are each 89; E and yellow, 80; F and green, 75; G and the average of the blues, 67; A and violet, 60; B and ultra violet, 53; C and the obscure rays (black), 54. Further, the comparison of harmonies comes out in an interesting manner. Low C and upper C sound well together, so red and black go well together. Red and green, or C and F, harmonize well; but red and orange no lady would wear, and C and D make a combination by no means pleasant. Red and blue, or C and G, also go well together. 7. The concluding part of the lecture was devoted to an illustration of the figures described by vibrating bodies. Several apparatus for this purpose were briefly referred to, but especial attention was given to an apparatus of great ingenuity devised by Mr. S. F. Pichler. Professor Barrett showed it with an electric light and a reflection on to a screen. The principle of it may be thus described: Two metallic vibrators, each with a small speculum, are fixed at right angles to each other, and sounds are produced by a current of air acting on one or both of them at pleasure. The perpendicular vibrator is tuned to a given note; the horizontal vibrator is fitted with a mechanical arrangement whereby its pitch can be graduated to any degree of nicety within the compass of two octaves. An apparatus is also provided whereby a pencil of light is concentrated upon the speculum of the perpendicular vibrator, whence it is reflected to the speculum of the horizontal vibrator. For lecture purposes artificial light is used, which is further reflected and magnified upon a screen. When musical sounds are produced by the vibrators, various luminous geometrical figures are formed on the horizontal speculum and reflected on the screen by the single or joint action of the vibrators described by the pencil of light; and the form and motion of such figures demonstrate the exact relations to each other of the musical notes produced. Sounds which harmonize to the ear produce regular figures to the eye, as, for example, segments of the circle, ellipses, ovals, circles, or straight lines; and if the amplitude of each vibrator be equal, these luminous figures will hover on the speculum or screen with an apparent steadiness like that of the heavenly bodies hovering in the sky. If the sounds do not harmonize, the figures are confused, unsteady, and complicated, presenting an appearance as if the wave lines were contending with each other. The mathematical relations of musical notes are also demonstrated, regular simple forms being produced by combination of those notes which result from vibrations bearing a definite numerical ratio to each other, while irregular and unsteady figures are caused by notes which have no such ratios. The pattern made on the screen by a discord is very bewildering to the eye.

Professor Barrett, in concluding, said: After seeing how musical notes may be translated into moving lines of light, the words put by our poet into the mouth of Lorenzo have additional interest:

> "There's not the smallest orb which thou behold'st
> But in his motion like an angel sings."

Major Festing conveyed the thanks of the audience to Professor Barrett.—*London Times.*

A Japanese Cotton Mill.

In an interesting report on the trade of Kagoshima, Assistant Consul Hodges gives the following description of a native cotton mill: The cotton weaving factory and spinning mill at Kagoshima is situated at Iso, and contains 100 looms of English make. It employs 250 workmen, who receive their wages in rice, men being paid from eight "go" to three "sho" six "go" per day; women from eight "go" to one "sho" five "go;" and children from eight "go" to one "sho," according to their skill. Both married and unmarried women are employed, and they are partial to the occupation. When the mill was first worked it was on account of the Prince of Satsuma, and an attempt was made to weave gray shirtings of similar weight and texture to those imported from Manchester. A few pieces were made; but on account of the China and Japan cotton being of a very short fibre, the work was so expensive and tedious that the attempt was abandoned, and the manufacture of heavy cottons commenced. The first cost of the machinery was about $80,000, and the erection about $50,000 more. It has now passed into the hands of a company, and the principal articles of manufacture are cotton cloth and cotton thread. Small quantities of a broad silk fabric, and of mixed cotton and silk fabrics, have also been turned out. The cotton used in the manufacture is imported from Osaka, the annual amount being about 2,600 bales, at an average of $16.10 per bale of 56 lbs. During one visit they were only manufacturing "momen," a coarse white cotton cloth, and cotton thread. With only 30 looms at work, they were turning out daily 10 pieces of cloth 252 feet long and 3 feet 5 inches broad; and of the woof, or cross thread, 350 catties. This cloth is worth about $4.60 per piece, and it, with the thread, is principally exported to Osaka. A striped cloth is also manufactured, but this is nearly all consumed in Kagoshima. The hours of work in the factory are seven daily, commencing in winter at 8.30 A.M., and ceasing at 4.30 P.M., with an interval of about one hour for dinner, at noon.

Snake Charmers Humbugs.

One by one, Science is annihilating every notion which ascribes to any person or class of persons phenomenal powers. Dr. Fayrer, in his splendid and valuable work "The Thanatophidia of India," says that the famous East Indian snake charmers are impostors, and that he has repeatedly detected them attempting, by subtle impositions and clever acting, to delude lookers-on into the belief that they were dealing with veritable wild snakes, when all the time the dancing cobras that made their appearance at the sound of the pipe were some of their own tame snakes, placed in certain spots beforehand.

These professional snake-catchers are many of them, in addition to their regular vocation, most expert jugglers, and exceedingly adroit at all kinds of sleight-of-hand tricks. It is their constant practice to "turn down" a few tame snakes in a garden hedge or somewhere close in the vicinity of a house they intend paying a visit to, ere they present themselves before the sahib, the owner of the premises; and then, with every appearance of good faith, the rascals request permission to be allowed to clear the compound of snakes; at the same time stipulating for a reward, perhaps one rupee a head for every snake they succeed in catching. If the gentleman of the house should happen to be a griffin, or new-comer, likely enough he will be induced to lend an ear to so plausible a request, and at length promise these crafty rogues so much for each snake they succeed in catching. Soon, to his horror and amazement, hideous serpents of various dimensions are produced, one from the straw in an empty stall in the stables, another from the garden hedge, and so on; till at last, perhaps, the fraud is carried too far and discovered.

Dr. Fayrer states that certain descriptions of serpents—chiefly of the genus *naja*—most undoubtedly are susceptible to, and in a measure become fascinated on hearing, musical sounds. "I have constantly seen," he says, "tame snakes in the possession of snake-catchers, on hearing the sound of the pipe, erect themselves and sway their heads from side to side, and beyond a doubt show pleasure at the strain; but I have never once seen a wild snake go through the same performance; and I believe that only tame reptiles carried about in baskets and 'broken in' for such an exhibition so conduct themselves. I have repeatedly offered snake charmers five rupees to bring out from its sanctuary, by means of music, a cobra known by me to be 'at home,' but invariably all their efforts have been in vain."

There are many who actually believe in the efficacy of stones which, when applied to a snake bite, are supposed to withdraw the poison; but if such a very simple remedy were really effectual, and a genuine specific, the snake stone cure would speedily be brought into universal use. "It would appear, however, that these people really prize these so-called stones, for I have been present when money has been offered to them to part with one, but declined."

Perhaps the strongest argument against this snake stone cure is that these very men often themselves fall victims to the bite of the cobra, though at the time in possession of a stone which they assert to be capable of working a cure. Moreover, when these professional snake catchers have to deal with an undoubtedly wild cobra in full vigor—although as a rule they display extraordinary pluck, skill, and resolution in capturing it, and on the first favorable opportunity will with wonderful quickness seize hold of and secure it—an attentive beholder cannot fail to remark the extreme caution and watchful management they display on first clutching hold of the animal, their whole demeanor and action differing unmistakably from the off-hand, careless manner which they assume when grasping one of their own harmless specimens; and it is an undoubted fact that these men really dread the consequences of a chance bite from a wild cobra quite as much as other mortals do, and are well aware that nothing can withdraw the deadly venom from a wound, or save life, when once the poison has mingled with the blood. But even with all the remedies as yet known, including copious doses of brandy and ammonia, and the immediate efforts of skilled surgeons, it is sad to be told by men such as Dr. Fayrer, and others who have devoted time and energy to the subject, that there is almost no hope of saving life if the bite has been inflicted by one of the most venomous snakes in full health and vigor.

East Indian Jewelry.

In our recent article on Signor Castellani's collection of antiquities, we referred to the fact of the lost art of making Etruscan jewelry. It is believed that valuable hints of how the ancient goldworkers operated may be gathered from the itinerant goldsmiths of the East Indies. These craftsmen carry their tools with them in their wanderings, and, where employment can be found, transform coins and bits of metal into filagree ornaments resembling the antique whilst still following their natural style. The *English Mechanic* has the following regarding the tools, and manner of working of these artists: A low earthen pot full of chaff or sawdust, on which he makes a little charcoal fire, a small bamboo blowpipe about 6 inches long, with which he excites the fire, a short earthen tube, or nozzle, the extremity of which is placed at the bottom of the fire, and through which the artist directs the blast of the blowpipe; two or three small crucibles, made of the fine clay of ant-hills, a pair of tongs, an anvil, two or three small hammers, a file, and, to conclude the list, a few small bars of iron and brass, about 2 inches long, differently pointed, for different kinds of work. It is astonishing what an intense little fire, more than sufficiently strong to melt silver and gold, can be kindled in a few minutes in the way just described. Such a simple portable forge deserves to be better known. It is, perhaps, even deserving the attention of the scientific experimenter, and may be useful to him when he wishes to excite a small fire, larger than can be produced by a common blowpipe, and where he has not a forge at command. The success of this little forge, it may be necessary to state, depends a good deal on the bed of the fire being composed of combustible materials, and a very bad conductor of heat. The smiths at Ceylon use a composition as a hone for sharpening knives and cutting instruments that is worth noticing. It is made of the capitia resin and of corundum. The corundum, in a state of impalpable powder, is mixed with the resin rendered liquid by heat, and well incorporated. The mixture is poured into a wooden mould, and its surface levelled and smoothed while it is hot, for when cold it is extremely hard. It is much valued by the natives, and preferred by them to the best of our hones.

A New Mode of Shipping Guns.

According to a contemporary, a smart firm of American engineers in London, who do not believe in peace, have hit upon a novel mode of sending small cannon to any place where they may be required, and where, perhaps, the powers in command might object to their introduction. The plan in question consists of taking two small guns and placing a round bar of strong wood down the bore of each, so as to hold them together, the muzzles joining. They then bind the whole with straw rope, and cover that with a coat of fireclay. This forms a perfect core, and round it is cast an iron column, like those used in building purposes. When complete they would not excite the suspicions of the most cautious custom officers.—*British Trade Journal.*