

Correspondence.

The Bodie Mining District.

To the Editor of the Scientific American :

The most promising field for mining enterprise on the Pacific Coast at the present time is undoubtedly the Bodie District. The Comstock Lode has ceased any longer to attract that universal attention which for so many years it has monopolized. The dividends of its mines have stopped, and investors are looking to the Bodie and other fields for opportunities that the Comstock no longer furnishes. Here on the coast mining has been reduced to a scientific basis. The element of chance is more and more eliminated; and sound hypotheses based on geological facts and years of careful experiment, guide the prospecting and development of new mines. The Bodie District, which I purpose to describe, is located in Mono county, California, near the Nevada line. It is about 36 hours' ride from San Francisco, almost due west. It is reached, however, by way of Carson, from which place you stage it over the country 110 miles. The first individual who discovered valuable mineral deposits in this district was W. S. Bodie, of Poughkeepsie, New York. This was as long ago as 1859, and from this enterprising prospector the district has taken its name, being organized as such in July, 1860. The Mono section was first worked, but not systematically; and in 1861, what was then known as Bunker Hill (since famous as the Standard) was discovered. A company, with a nominal capital of \$1,110,000, was incorporated in 1863, but failed in any practical results, although such names as Leland Stanford and F. K. Bechtel were at its head. In the following year the Empire Company of New York was incorporated, combining four or five other mines, with \$10,000,000 capital. Trenor W Park succeeded in raising \$300,000 actual money on stock sales for development purposes. The effort as a whole, however, proved entirely theatrical. A very good mill had been erected, and ten years later, when the Syndicate Company was incorporated with large privileges, this was refitted, and with a sufficient capital work began in earnest. Then followed the astonishing developments in the Bunker Hill (Standard) mine which brought abundance of working capital into the district, and speedily the Bechtel, the McClinton, Belvidere, Bulwer, Bodie, Mono, Tioga-Con., and other mines were opened up; followed, since the establishment of the "Veta Madre" theory (or mother vein), by the Dudley, Jupiter, South Bulwer, Chieftain, Noonday, Richer, and a host of others.

The geological character of the entire district is volcanic—a volcano within a volcano; a chemical caldron subsequent to a widespread upheaval by subterranean fires," as one writer puts it. "Bodie mountain," in the language of Professor Silliman, who reported on the district, "is an isolated mass of trachytic porphyry, having white crystals of a feldspathic mineral implanted in a lavender colored paste; it is an island of irruptive rocks. The whole surface of the surrounding region is covered with decomposed porphyry, in which are seams, abundantly supplied with fragments of quartz, jasper, chalcedony, and other vein stones derived from the breaking up of the crests of the mineral lodes. The eye experienced in gold bearing drifts recognizes at once, in the aspects of the sides of this mountain, the probability of the existence there of profitable deposits of gold." Silliman thoroughly believed in the existence of one great mother lode. Subsequent discoveries tend to substantiate this. A transverse section of Bodie Bluff shows the many veins of ore, spread out like the sticks of an open fan; that is, they all tend to a common center, where they are supposed to meet and unite with the mother vein. This formation extends through the entire district, but no cross cuts have yet been made. A theory entertained by many is that the whole geological formation was riven asunder, and the chasm filled by sedimentary action. Professor William P. Blake, of the Sheffield School of Mining, believes that the structure of the rock indicates that "the veins were deposited gradually in fissures, by thermal springs." Both theories would favor the great depth of the veins. On the surface the veins are hard and sterile of metal; at sufficient depth they become soft, friable, and rich; and deeper still more rich, and so decomposed as to even yield to the shovel. The extent of the mineral ledge is between two and three miles. It was supposed at first that the general dip of the veins was in a southwesterly direction, but recent developments prove conclusively that they run easterly, and the probabilities amount almost to a certainty that the Dudley and Jupiter claims, on the east side of the ridge, have the same rich ore bodies that maintains in the Syndicate, Standard, and Bodie. In all these leading mines the farther they prospect the more ample and richer become the mineral deposits, tending more and more to prove the "veta madre" or mother vein theory. They are down over 400 feet in the Bodie, 520 feet in the Tioga, and over 700 feet in the Standard, but in the latter are temporarily drowned out with water. The Bruce drift in the Bodie has proved immensely rich and increases as it goes southward. In the Standard there is a thousand feet of rich ore laid bare. All these veins are mingled with carbonate of lime, a good indication for permanency. This formation extends clear through to Noonday on the extremest south, with the certainty that the rich veins of the Standard and Bodie bear off to the east, through the east side of Mono. There is every probability that the next bonanza will be opened in Jupiter and Dudley, which are just to the south and east of Bodie and Mono. Good ore is already being taken out, but they are waiting

for their pumping machinery, so that they may penetrate to the lower levels below the barren cap rock which covers the district. When this is accomplished these mines will likely prove a dividend proposition. A large amount of machinery is being brought into the whole district. The Noonday is erecting a 20 stamp mill. The Standard and Bulwer Companies are jointly putting up a 30 stamp mill; and pumping and hoisting machinery has been ordered for a number of other mines.

There is unquestionably a big future before them all. The gold and silver mineral is not found in pockets, but is disseminated with average yield throughout the length and breadth of all the veins. Resembling the Comstock in many striking particulars, the Bodie bids fair to outrival that veteran district, which has so long dominated the stock market of the Pacific Coast. H. S. W. San Francisco, August 1, 1879.

A Canal Mowing Machine.

To the Editor of the Scientific American :

I notice in your paper for August 16 an article with the following heading, "A Canal Mowing Machine Wanted," and wish to say that such a machine, and one which is as much superior to the one described in that article as a land mowing machine is to a scythe, has already been invented, and has been in operation every summer for a number of years on the canal of the Connecticut River Company, at Windsor Locks, Conn. It is driven by belting from the engine of a steamer built especially for it, and works well. It will be run a part or the whole of the coming week.

The machine consists of a frame of as near as I can guess 12x8 or 10 feet, with a shaft at the end to be attached to the boat, on which, at about the center, are a tight and a loose pulley, and at each end a disk or crank, with short connecting rods to the side rods running through guides, and connected with the knife bar by small chains over pulleys. I have no time for a detailed description. It can be seen probably at any time, on application to Mr. S. H. Allen, Secretary, Windsor Locks, Conn. I would advise Mr. Fish, of the Erie Canal, to examine this machine. The Windsor Canal is 6 miles long, and is the largest water power in the State of Connecticut. It is also a navigable canal, for which purpose it was built.

J. S. ALLEN, Engineer.

Windsor Locks, Conn., August 16.

"The Devil's Darning Needle."

To the Editor of the Scientific American :

The statement of Mr. W. M. McGee, in your issue of August 16, to the effect that the thick-legged walking-stick (*Diapheromera femorata*), which I recently treated of in your columns, may sometimes survive the winter, is founded on mistaken identity. It dies with the first severe frost, and passes the winter, as I have shown, in the egg state. Not so with the water boatmen—certain elongate long-legged heteropterous insects (genus *Ranatra*)—which bear a very general resemblance to the walking-sticks, and which were, beyond any doubt, the insects observed by Mr. McGee. Popular terms are variously applied in different parts of the country, but that employed at the head of this communication is most associated in the popular mind with the dragon flies (*Libellulidae*). Yours respectfully, C. V. RILEY.

August 16, 1879.

Turbo Shells and Sea Beans.

On the beach of Little Saba Island (St. Thomas) there was being formed a reddish sandstone conglomerate rock composed of the debris of the rock of which the higher parts of the island consist, cemented together by calcareous matter derived from the corals and calcareous sand.

This rock, which was hard and compact, contained embedded in it plenty of the various corals from the beach, and large turbo shells (*T. pica*) with their naere quite fresh in luster, and their bright greenish color unimpaired.

Large examples of these turbo shells, as much as two inches in diameter at the base, are in St. Thomas, carried up far inland by terrestrial hermit crabs.

I saw a large number of them among the bush at an elevation of 1,000 feet, some of them with the crabs in them, many empty. These large, heavy sea shells occurring in abundance at great heights puzzled geologists, until it was found that they were carried up by the crabs.

On the shore at Little Saba Island grow a number of plants of *Guilandina bonduca*. This plant bears a pod covered with prickles, which contains nearly spherical beans of about the size of a hazel nut, which have a perfectly smooth, as it were, enameled surface, and are flinty hard. These seeds float, and are carried by ocean currents to distant shores, and are in Tristan da Cunha and Bermuda known as "sea beans," and supposed to grow at the bottom of the sea. Don Jose de Canto showed me one found in the Azores.—Moseley, Notes by a Naturalist.

We have it on the authority of Dr. Bock, of Leipsic, that the nervousness and peevishness of our times are chiefly attributable to tea and coffee; the digestive organs of confirmed coffee drinkers are in a state of chronic derangement, which reacts on the brain, producing fretful and lachrymose moods. Ladies addicted to strong coffee have a characteristic temper, which might be described as a mania for acting the persecuted saint. Chocolate, he adds, is neutral in its psychic effects, and is really the most harmless of our fashionable drinks.

CUTTING PACKING COMPANY.—ONE OF THE LARGEST ESTABLISHMENTS OF THE KIND IN THE COUNTRY.

Next to mining, the fruit products of the Pacific coast give it celebrity throughout the world. The size, quality, and abundance of these products render them especially suitable for foreign markets, where they are largely shipped in the shape of canned goods, prepared so as to retain their natural flavor, and cheapen their comparative cost to the consumer.

As illustrating this large and growing industry, the Cutting Packing Company, both by merit and reputation, is well worthy of description. The house was established in 1853, on Commercial Street, San Francisco, Cal., under the name of Cutting & Co., and was necessarily very small in its capacity and imperfect in its appointments at that time.

In 1875 it was incorporated as the Cutting Packing Company, and by careful management and a proper spirit of enterprise the development of the business has been constant and reliable, until at the present time its magnitude is enormous and really a monument to the energy that developed it. Besides canning fruits, the concern now can meats, vegetables, honey, preserves, jams, and jellies, and manufacture pickles and cider. The following figures will prove interesting to the readers of the SCIENTIFIC AMERICAN, as concisely exhibiting the magnitude of this important industry:

GOODS PREPARED FOR MARKET IN THE YEAR 1878.

900,000 cans fruit	averaging 2 1/2 lb. each.
475,000 " vegetables	" 2 1/2 " "
110,000 " meats	" 2 1/2 " "
285,000 " preserves, jams, and jellies	" 2 " "
78,000 " strained and comb honey	" 2 " "
24,000 glass packages honey	" 2 " "
18,000 " " jams and jellies	" 2 " "
15,000 " " pickles and sauces	" 2 1/2 gal. "
18,000 wood packages pickles and sauces	" 25 " "
12,000 quarts champagne cider	

This product represents the following material used:

FRUITS.	
Apples	190 tons.
Apricots	110 "
Blackberries	75 "
Currants	45 "
Cherries	25 "
Gooseberries	25 "
Grapes	60 "
Raches	325 "
Plums	100 "
Quinces	20 "
Raspberries	40 "
Strawberries	45 "
Pears	210 "
To 1	1,317 "

VEGETABLES.	
Asparagus	15 tons.
String-beans	45 "
Peas	60 "
Tomatoes	350 "
Pickles	175 "
Corn	25 "
Total	670 "

MEATS.	
Beef, boned	200,000 lb.
Mutton	90,000 "
Pork, etc.	12,000 "
Total	322,000 "

MISCELLANEOUS.	
Salt	160,000 lb.
Vinegar	72,000 gal.
Sugar	380,000 lb.
Honey	110 tons.

The tin cans for putting up this immense quantity of goods are all manufactured by the concern, and it requires 1,750,000 of these, averaging 2 1/2 lb. each. For their construction 7,500 boxes of tin plate are used, 15 tons of pig lead, and 15 tons of pig tin. The plate tin is imported from England, the pig tin from Australia, and the pig lead is mined on the coast. Sugar is purchased by the car load, and salt by the schooner load. In fact everything is conducted on a wholesale principle, yet the most scrupulous regard is paid to the minutiae of the business, and each department works in perfect harmony with the others toward the advancement of the whole.

The warehouses and factory are located on Main Street, Nos. 17 to 41, just off from Market Street, the principal street of the city. The extent of the premises is 180 feet on Main Street, and 275 feet deep; stables, cooper and machine shops are attached; the main building for general manufacturing is 90x137 feet, and four stories high.

When I visited this large factory the peach season was at its height, and the capacity of the establishment was taxed to the utmost to dispose of the fine harvest of this abundant product of the State. Stepping on the elevator with one of the proprietors of the house, we were taken up to the fourth floor, where between five and six hundred women were busily engaged at long tables in peeling, pitting, and canning the luscious fruit. The most admirable system prevails here for the dispatch of business, and it requires but a few minutes for fruit that had been harvested the same day in the neighborhood of San Francisco, to be put in proper shape for the consumer in some far off market. An elevated railway runs the length of the room between two rows of tables; this facilitates the transportation of the filled cans to the siruping room, where boiled sirup is poured among the peaches, filling every crevice. They are then soldered up and cooked the necessary time which experience has suggested as best.

The concern manufacture their own sirups from the best "A" crushed sugar. They are strained twice to exclude all possible impurities.

I was shown a very neat device for soldering the tops and bottoms of the cans, upon which the concern has a patent. It consists of a simple piece of solder wire, which is cut and bent so as to just fit nicely around the edges of the can. After the wire has been properly dropped into position, the can is placed with the top or bottom, as the case may be, in a close fitting aperture on a hot oven; the wire speedily

melts into the crevices, forming a thoroughly tight joint all around.

All the jellies, jams, and preserves that the concern manufacture are made from the pure juice of the fruit with the very best sugars. A hydraulic press is used to extract the juice, which is boiled in copper kettles until thoroughly jellied.

The meat used is bought slaughtered. In the boning department, on the second floor, expert hands cut out every particle of bone. It is then taken to the third floor and cooked in large meat vats, and afterward nicely canned.

The champagne cider is manufactured after approved methods; portions of the second and third floors are devoted to this department.

The department for preparing pickles is just across the alley from the main building. Gherkins, peppers, limes, beans, cauliflower, and a variety of others are manufactured. There are six large pickle tanks, with a capacity of 8,000 gallons each. These are filled solid with pickles, which are prepared every fall, and are allowed to stand in the brine from four to six weeks until wanted. In the pickle packing room they are treated with spices and vinegar, and kept in large quantities to be drawn upon. The concern manufacture their own brine and all their wooden packages. The company make a specialty of manufacturing all pickles for family use in pure malt vinegar.

The first floor, or basement, of the main building is largely devoted to the storage of fruit juices, which are hermetically sealed in large cans and placed on racks, to be drawn upon for jellifying during the winter. The floor of this basement is thoroughly "scowed," so as to keep out the tide, which in this part of the city rises several feet.

The labeling department occupies a portion of the third floor. All the cans are lacquered to prevent sea damp and moulding. They are then handsomely labeled and packed in boxes, containing one or more dozen, for shipment.

In the rear of this department the glassing of pickles and sauces is done. Each bottle or glass is corked, bladdered, waxed, and capped with foil to be properly hermetically sealed for shipment. The honey used by the concern is the finest the bee ranches of California can furnish. It is simply run into cans and jars, either with or without the comb. Some kinds of sauces and catchups are put up in barrels. There is manufactured however, a very fine Worcestershire sauce which is handsomely bottled. Olives are prepared in the factory both from native growths and imported. Some very fine stuffed peppers are manufactured, besides a variety of other small articles. The premises have ample water privileges, are perfectly neat and clean, and devoid of any bad odor.

The concern owns and operates three large salmon canneries: one is located at Eagle Cliff on the Columbia, one on Eel River, California, and one in Alaska. Besides manufacturing eleven different kinds of preserved meats, eight different kinds of sauces, eleven kinds of jellies, and nine kinds of jams, the concern are agents for many of the best Eastern preparations, as well as all of Burnett's extracts.

During the busy season, from May till November, the business requires the employment of 500 hands on the average, and 150 hands from November till April. The weekly payroll averages from \$2,500 to \$3,000. Goods are shipped to the East Indies, to China, to Australia, and the coast is supplied. It is an industry as diversified as it is extensive, and it utilizes the products of nature in a semi-tropical climate for the benefit of mankind everywhere. H. S. W.

Secretary Evarts on American Industries.

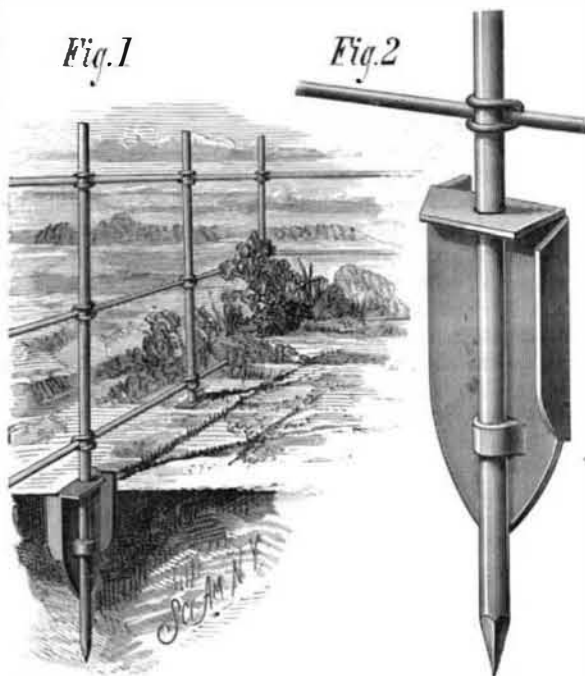
In concluding an official review of the information furnished by American consular agents abroad, with respect to the conditions of trade, wages paid, cost of living, commercial prospects, and so on, in foreign countries, Secretary Evarts says:

"For the first time our manufactures are now assuming international proportions. At a time of universal depression we have met those nations which held a monopoly of the world's markets, met them in their strongholds, and established the fact that American manufactures are second to the manufactures of no other nation, and that, with a proper and patriotic understanding between capitalist and laborer, we can command a fair share of the buying world's patronage, and command that patronage with larger profits to the capitalist and higher wages to the laborer than can be made or paid in any other country. There is something in the Republic which gives an individuality to the people of the United States possessed by no other people to such a degree. Our inventive genius in mechanical appliances is original, and at least 25 years ahead of Europe. Our people accept innovation, are prepared for it by anticipation; Europeans do not. One workman in the United States does as much as two workmen in most of the countries of Europe; even the immigrant from Europe attains this progressive spirit by a few years' association with American workmen. We have no oppressed and stupid peasantry, little more intelligent than the tools they handle. All are self-thinking, self-acting, and self-supporting. Within the last 15 years we have demonstrated our ability, by the brilliant development of our own resources, to exclude, by honest competition, foreign manufactures, to a large extent, from our shores. The question which now peremptorily challenges all thinking minds is how to create a foreign demand for those manufactures which are left after supplying our home demands. We cannot stand still, for the momentum of increase will soon become so great that it will push us outward anyway;

to push us safely and profitably is of so much importance as to almost overtop all other public questions of the hour. This question appeals equally to the selfishness and patriotism of all our citizens, but to the laborer it appeals with tenfold force, for without work he cannot live, and unless we can extend the markets for our manufactures he cannot expect steady work, and unless our manufacturers can undersell foreign manufacturers we cannot enlarge our foreign market. The first great truth to be learned by the manufacturers and workmen is that the days of sudden fortunes and double wages are gone. We must realize the fact that ocean steam communication has annihilated distance and brought the nations face to face. This drawing together of the nations means equalization in trade, profits, wages, etc., the advantage being with those who soonest accept the situation, and show the most sensible continuity in the new paths of success. The Consul at Newcastle-upon-Tyne shows that that city is commercially nearer to New York than to London. If steam communication can thus bring one of the leading cities of a small island like England nearer to New York than to its own capital, it can work equal wonders with the leading seaport cities of all Europe in their commercial intercourse with the seaport cities of the United States. This is a question of great importance to both laborer and capitalist, for it must revolutionize all past theories of trade and commerce, by establishing international equalization. In the near future, the workingman of New York cannot expect twice or thrice the wages of his fellow worker in Europe, while all other things—food, rent, clothing, etc.—are on an equality; nor can the coal miner of Pennsylvania expect twice the wages of the Northumberland miner, while coal from the Northumberland mines can be landed in New York at less than the price of Pennsylvania coal."

NEW IRON FENCE POST.

The engraving shows a novel iron fence post recently patented by Mr. James Carpenter, of New Hope, N. Y. The invention consists in an iron bar forming the post, and a flanged pointed blade that slides over the bar and is driven into the ground to prevent the post from swaying. By look-



CARPENTER'S IMPROVED FENCE POST.

ing at Fig. 1 the construction of the post will be readily understood; and Fig. 2 shows a fence built with these posts.

It is claimed by the inventor that two men can put up and finish 100 rods of this fence in a day, the posts being one rod apart, and three strands of barbed fence wire being used. The cost of this fence, compared with other kinds, is said to be very low.

A Vegetable Curiosity.

A remarkable freak of vegetation has appeared in the grounds of R. B. Tatman, at Worcester, in the shape of a potato vine which bears tomatoes. It appears to be a mixture of the two vegetables, and is accounted for by the fact that a strong tomato vine from chance-sown seed grew in the same hill with the potatoes, and the pollen of the two plants became mixed. Unfortunately the vines were pulled up before the peculiarity of the growth was noticed. Some of our agriculturists may derive a valuable suggestion from this. As both the potato and the tomato are of the solanaceae family, it is not impossible that one should be fertilized by the other, and a remarkable economy of labor might be effected if careful and scientific cultivation should produce a plant which should bear good potatoes at the roots and good tomatoes on the tops.—*Springfield (Mass.) Union.*

Arsenic in Paper Collars.

Attention having been called by the SCIENTIFIC AMERICAN to the poisonous character of the starch used for some laundry purposes, the paragraph was reproduced and attracted attention in the English papers. The result has been an analysis of certain paper collars and cuffs, by a doctor, at the instance of a patient who showed symptoms of arsenical poisoning. The doctor reports that he has extracted 10.4 grains of arsenic from a single collar.—*Science News.*

The July Product of Petroleum.

According to *Stowell's Petroleum Reporter*, the number of producing wells at the close of July was 11,468, being an increase in July of 245. Total production in July, 1,714,517 bbls. Daily average for the month, 55,307 bbls. The average daily production of each well for the month was 4.9 bbls.

The total shipments of crude, and refined reduced to crude equivalent, by railroad, river, and pipes to the following points, were 1,625,035 barrels

New York took.....	706,135 bbls.
Pittsburg ".....	278,030 "
Cleveland ".....	292,924 "
Philadelphia ".....	139,968 "
Boston ".....	85,696 "
Baltimore ".....	57,187 "
Ohio River refiners took.....	20,336 "
Other local points ".....	44,759 "

Total shipments 1,625,035 "

Included in the above shipment there were 212,213 barrels of refined from Titusville and Oil City, which is equal to 318,320 barrels of crude.

The stock in the producing regions has been increased during the month, 89,482 barrels, making the total stock at the close of the month, 7,330,132 barrels, and is held by pipe companies, tankers, and operators.

Retouching Varnish.

A good retouching varnish is a boon to all retouchers, and those who are unfortunate enough to be plagued by too thin films will gladly hail a formula which promises this desideratum. In his recent work on retouching, M. Janssen, the *Photo. Correspondenz* says, recommends the following varnish:

Alcohol (sp. gr. 0.830).....	60 parts.
Sandarac.....	10 "
Camphor.....	2 "
Venetian turpentine.....	4 "
Oil of lavender.....	3 "

This varnish may also be used for paper pictures. The retoucher should not set to work as soon as the negative has been varnished, as the film will not then be hard enough to bear the touch of a lead pencil. The varnished film is in the best condition for retouching when a day old.

GLOSS FOR PHOTOS.

The same gentleman also gives a formula (said to be used by Salomon, of Paris) for a cerate for giving a high gloss to albumenized pictures. The components are:

White wax.....	800 grammes.
Elemi resin.....	10 "
Oil of lavender.....	300 "
Benzoin resin.....	200 "
Oil of spikenard.....	15 "

Olives in California.

Recently Mr. Elwood Cooper, of Santa Barbara, California, shipped to San Francisco 1,000 gallons of well clarified olive oil, the product of his orchard at Santa Barbara. According to the *San Francisco Alta*, Mr. Cooper has 6,000 trees, some of them 7 years old, and these produce 20 gallons of berries each on an average in a good year, and one gallon of oil is obtained from seven of berries. Trees 10 years old in a good soil will average 50 gallons of berries in a good year, but sometimes will yield 150 gallons. After a good crop the tree usually takes a year's rest, so that its good years alternate. The whole yield from a mature orchard may be set down at 200 gallons of oil to the acre, and of this 50 gallons may be deducted to pay for gathering the berries and making and marketing the oil.

The *Alta* believes that the olive should receive more attention in California, since it will bear good crops, on poor soil, with less care than any other plant. The hillsides, now worthless, should be covered with olives. The olive requires no irrigation, grows on clayey or rocky soil without much cultivation, and begins to bear in five years, coming to full bearing in ten years.

Rat and Mice Exterminator.

A German newspaper gives the following simple method for exterminating rats and mice, which, it states, has been successfully tried by one Baron Von Backhofen and others for some time past: "A mixture of two parts of well bruised common squills and three parts of finely chopped bacon is made into a stiff mass, with as much meal as may be required, and then baked into small cakes, which are put around for the rats to eat." Several correspondents of the paper write to confirm the experience of the noble baron and his neighbors in the extirpation of rats and mice by this simple remedy.

Transparency of Metals.

With the aid of electricity films of several metals of such minute thickness as to allow the light to pass through them can be produced. An electric current is passed into a wire of one of the metals, that extends into a glass tube containing rarefied air or gases. The particles of metal that the electric current loosens from the wire are deposited on the sides of the tube and form a transparent film. The light that passed through gold was a very handsome green, silver produced blue, copper light green, platina bluish gray, zinc dark bluish gray, and iron brown.—*Chemiker Zeitung.*