

THE GINSENG.

BY NICOLAS PIKE.

Few people are aware that the plant called ginseng, the root of which is of so much importance to our Celestial brothers on the other side of the world, is growing in our own country from Canada to the Southern States and west to the range of the Rockies. In the vicinity of the Catskill Mountains especially, and in the forests back of them, it is found in great abundance.

The American root is said not to be the genuine article, but it belongs to the same family (*Araliaceæ*) and the same genus (*Panax*) as the Chinese root, the former being the *P. quinquefolium*, Lam., and the latter *P. ginseng* of Meyer.

It is a perennial plant which sends up annually a smooth round stem about a foot high, which divides at the summit into three leaf stalks, each of which supports a compound leaf consisting of five (sometimes seven) petiolate, acuminate, serrate leaflets. It bears yellowish flowers and bright scarlet berries, a single plant often bearing 60 to 70 seeds. It has a fusiform root about as large as an index finger, with two to four rootlets, is brittle to the touch, and has a slightly bitter sweet taste. The name ginseng is said to signify "man plant," from a fancied resemblance in the root to the form of a human being.

The berries are fully ripe about the first of September, when they fall to the ground and are covered by the decayed leaves of the forest. There they lie for eighteen months before the young seedlings appear, as it takes that length of time for the seeds to germinate, and some years elapse before the root is ready for digging for commercial purposes. September is the month selected for collecting the roots, as at that time the plant has shed its seeds, and the sap has returned to the roots, making them heavier and consequently more valuable. Digging it before would in time exterminate the plant. Usually the root grows near the surface, but sometimes it sends a tap root deeper.

Strange to say, though the roots acquire value from age, they do not increase much in size, five ounces being a rare weight, but they seldom exceed two here. After gathering, they are washed perfectly clean and put in a cool place to dry, which requires nearly a month.

Artificial heat is said to deteriorate its medicinal qualities, but steaming is resorted to in order to whiten it. The larger, cleaner and more entire roots have greater value when put on the market.

Back of the Catskills is a forest extending over twenty miles, and there the ginseng grows in great abundance, and thousands of pounds are yearly gathered and sent to the New York market for exportation to China, as there is little use for it here. This simple plant gives employment to numbers of poor people in the country, gathering and preparing it for market.

I was quite surprised when on a short visit to the above mountain district to find that the whole population in the neighborhood, men, women and children, turn out "ginsenging," as they term it. They close their houses for the day, take food in their baskets, and with a small spade trudge away among the woods and often go many miles into their depths. Sometimes they collect as much as ten pounds in a day, of the green roots.

There have been so many people engaged in this business the last few years that the plants are becoming scarce, and if care is not taken, they will soon be exterminated in this particular neighborhood.

There are two other ginsengs in America, but they are easily distinguished from the *quinquefolium*. The dwarf ginseng, *P. trifolium*, has a round root, white flowers, purplish stems and only three leaflets on the leaf stems. The third species, *P. horridum*, is a prickly plant and grows west of the Rocky Mountains.

American ginseng is mostly shipped to Hong Kong, and is reckoned in quality next to Chinese and Korean. It realizes here from \$2 to \$4 per pound. There are several grades, and in China they average superior, selected root \$450 per picul,* large selected \$380, good ordinary \$300, medium \$270, fair \$250. Extra choice large and heavy have at times commanded fancy prices, even to \$1,000 per picul. The exports from America are nearly 500,000 pounds per annum.

Many attempts have been made to cultivate ginseng in America, but with little success till recently. At Summit Station, N. J., is what is known as Stanton's ginseng farm, and there its cultivation is a fixed fact. This gentleman began experimenting five or six years ago, and has not only raised the seeds but transplanted the young plants with perfect success. This will doubtless open up a new industry, important to those whose own forest lands where they can establish plantations

* A picul is 133½ pounds.

of ginseng which will pay them handsomely if well cared for. The American root is said to be rich in gum and starch. Some people have acquired a taste for it and chew it like gum. At first, when the ginseng was exported to China, it commanded fabulous prices, but so much has been rushed on the market, and often of inferior quality, that its value is greatly deteriorated.

The Chinese consider the ginseng as an infallible



ROOT OF THE GINSENG OR MAN PLANT.

cure for every known disease. It is called in their language "ling-pao-you-y-tau," that is, "supernatural treasure for all desires." The great difficulty exists in varying the dose and combining it with some suitable liquid. This wonderful medicine is often given in the shape of small red pills not larger than a pea (a pure homeopathic dose). The component parts of these pills it is said are not known, but the secret has been held in one family for centuries. The sale of these pills is immense and they are sold by weight. A silver bar or coin is placed in one scale and the pills in another. A missionary once told me that a Jesuit priest had submitted some of these pills to chemical examination, and he found ginseng and red pepper the principal ingredients, though there were other drugs he did not know in minute quantities.



PANAX QUINQUEFOLIUM—GINSENG.

This root, from its fancied resemblance to the form of a man, excites as much superstition and fear among the ignorant Chinese as the mandrake formerly did in Western Europe. Like it, they believe that when torn from the ground it emits cries and groans, and in some remote places it is dug up with fear and trembling, as it is supposed to be guarded by the wolf, tiger, leopard, and snake in the gloomy forest depths it loves, and can crawl under the ground if it pleases.

Ginseng is both wild and cultivated in China, but

the former is the more highly prized. It is called jenshen, and in Quantung and Manchuria is an imperial perquisite. So expensive is it that few save the wealthiest people can use it. Speaking of the Manchurian root, it is said "to love moisture and the depths of forests, and nestles in recesses where the sun never penetrates."

The Chinese believe that a root which has been created in the form of man must have been intended to cure all his ills. They assert that the wild root will prolong life for days after a person has been at the last gasp.

The effects of the ginseng are supposed to be alterative, tonic, stimulant and demulcent. That grown in the various provinces is carefully marked with locality, as each appears to possess some different quality.

China receives her supply from Korea, Japan and America, as well as from her own growth. The Korean is considered next to the native Chinese, then the American (called the *yung-seng* or foreign), and the Japanese.

The Manchurian ginseng is given preference over all others, and when carefully selected and clarified sells for its weight in gold, and is used mostly by the imperial family. The Korean is one of the articles of tribute sent annually from the court of Korea to that of China, and is highly valued. It is said to take 30 years to come to perfection. Much is cultivated, but only the wealthy can afford to grow it, as the poorer classes cannot set apart their ground for years and devote their time to it. There is, however, an inferior quality found wild, largely exported. The Korean is said to be highly tonic and stimulant to persons suffering from nervous debility, etc. The American is considered a most effective remedy in all fevers, and in convalescence from febrile affections and other ailments.

The ginseng cultivated near the river Amoor, in the north, grows in sandy soil. The seed is sown in spring, and the roots taken up in autumn, when they are stored in a room above freezing point, and covered with dry earth. Next spring they are planted out and again taken up in autumn, and this is repeated for four or five years, until the plant has attained fair growth.

Very little is used by the people in the north, where the soil is dry and climate cool, but in the south the Chinese use it in both drinks and food as a precautionary measure against sickness, where there are great heat and moisture. Pills, confections, and infusions are the principal ways of using the root, the latter the most common. The Chinese Tartars also use ginseng extensively. They boil it in their soup every morning, and a half-ounce dose is considered a cure for consumption. Everywhere the greatest care is required to preserve the roots from damp and the attacks of worms, and decoctions are almost always made in silver vessels. The imperial government claims a tax on all the ginseng collected in that vast empire, which is willingly paid for such a panacea.

Even in the most out of the way places the druggists, or, rather, herbalists, as they deal so largely in plants and roots, put a sign over their doorposts indicating that "Here are sold ginseng and young deer's horn pills." A decoction of the root is most highly valued when a person is suddenly in the last extremity and unprepared for death. The medicine is said to ward off the terrible enemy for four or five days, thus giving the man a chance to arrange his family affairs, so that he can pass calmly and content to the other shore. If we could

only have the same faith, how much trouble it would save!

The ginseng formerly had some reputation in Europe, but the doctors both there and in America have decided that there is so little real medicinal worth in the root that it has been discarded, like so many other herbal remedies of former days. How strange it is that this simple plant we think so worthless possesses a root* valued so highly in another hemisphere that its sale brings in an enormous revenue to the imperial government, and is used by millions of people with implicit faith in its efficacy. The Celestials look upon our distrust of it as another proof of the want of common sense in the "foreign devils," while they regard with still more contempt many a drug in vogue with our practitioners.

THE Académie des Sciences has submitted a new system of musical notation in which twenty-seven characters replace the 203 symbols now employed to represent the seven notes of the gamut in the seven keys.

* The plant is held to be poisonous.

Cocoa Nut Butter.

A recent number of the *Kew Bulletin* contains an article on cocoanut butter, a valuable edible fat prepared from the kernel of the cocoanut and recently introduced into commerce. It is a white, odorless, almost tasteless fat, which solidifies at about sixty-five degrees Fah., becoming above that temperature a pure white oil.

"If cocoanut butter can be prepared, as is suggested, from the ordinary 'copra,' or dried kernel of the cocoanut, as shipped from tropical countries, there would be an almost unlimited supply of the raw material available from various parts of the world." According to Dr. Zerner, of the Royal Imperial and General Hospital in Vienna:

"The cocoanut butter, which, on account of its low melting point, is exported in tins, furnishes a pure white transparent mass of the consistence of lard, without granular texture, which at a temperature of seventy-nine degrees Fah. melts to a clear fluid and solidifies again at sixty-seven degrees Fah. It has a slight agreeable smell, melts on the tongue, leaving a mild but in no respect acid taste behind it. In ether it dissolves completely. If the ether is evaporated over water and distilled water is added to the residue, the solution gives a neutral reaction. I have often repeated this test with cocoanut butter which had remained open for days (fourteen days), also with pharmaceutical preparations eight to fourteen days old, in the preparation of which cocoanut butter had been used. The cocoanut butter is, therefore, free from fatty acids, and even if left open for the space of eight to fourteen days does not turn rancid, with the exception of the top layer, which comes in contact with the air.

"With regard to its chemical composition, cocoanut butter differs from most other fats, and particularly butter, lard, and margarin. In its fatty constituents and the amount of volatile fatty acids, it stands next to butter among solid fats.

"Cocoanut butter differs from all other vegetable and animal fats, by its saponification degree (258.5 according to Rud. Benedikt in Vienna), and on account of this high saponification degree all adulteration is impossible.

"Artificial digestion tests seem to show that the cocoanut butter exercises no injurious influence whatever over digestion.

"The next point was to ascertain how the cocoanut butter stands with regard to micro-organisms. It is well known that in this respect milk butter is very far from perfect, as apart from the numerous germs, which, for the most part, are not pathogenic, that may be introduced during its preparation, and the microbes already present in the milk itself, this article of food affords an excellent nutrient fluid for a large number of micro-organisms.

"It follows that, although in any given case other ways and means of infection may be excluded, this may still take place through the agency of milk and butter. The possibility of a transfer to the human consumer of the tubercle bacillus, as well as of other micro-organisms, which have got into the milk from animals suffering from infectious diseases, is in the case of cocoanut butter, a vegetable fat, excluded from the first. Cocoanut butter has been proved by our investigations to be both free from germs and also to be a very bad nutrient medium for micro-organisms. Even when agar-agar or Ceylon moss (*Gracilaria lichenoides*) was mixed with the cocoanut butter, and then allowed to remain open, the number of germs was found to be less than in agar-agar without the mixture of butter. One more experiment may be mentioned. If sterilized milk is added to cow butter and kept at a warm temperature, the milk coagulates in twenty-four hours, proving the presence of bacteria in the butter. This coagulation does not take place if, instead of milk butter, cocoanut butter is added to the milk.

"From what has already been said the conclusion may safely be drawn that the cocoanut butter, from a chemical and bacteriological point of view, meets all the requirements of a food substance.

"Our further investigations were directed to ascertaining whether cocoanut butter was suitable to healthy and sick people alike. Through a period of four weeks we distributed food to 116 patients in the form of pastry, roast meats, and farinaceous foods, in the preparation of which cocoanut butter was used in the place of fats.

"On account of this fat being almost free from water, one-quarter less may be taken, both in baking and cooking, than is generally used, if ordinary butter or lard is employed; and for the same reason it is necessary, in making pastry, to replace the twenty-five per cent of water, which the cocoanut butter contains less than any other fat, by adding from seven to eight tablespoonfuls to about every pound of butter used.

"A little more salt must be added to the food, and the butter must always be heated before being used for cooking. Foods prepared in this way, as well as pastry, were always found to be eaten without any inconvenience whatever. The taste was undoubtedly pleasanter than in dishes prepared with animal fats. The statement of a colleague, Dr. H., is of particular importance

in this respect. After recovering from disorder of the stomach he could not eat pastry without being afterward troubled with pyrosis and cardiac pain. He could eat pastry prepared with cocoanut butter almost without any inconvenience.

The experiments with patients proved cocoanut butter to be an easily digested fat that causes no disorders in cases of impaired digestion. Of the 116 patients, among whom were individuals affected with every form of dyspepsia, not one complained of any discomfort or of any ill effect after the consumption of pastry prepared with cocoanut butter, though pastry, as a rule, is not an easily digested food on account of the fat. In three cases where the pastry was partaken of an hour after vomiting, there were no ill results noticeable; on the contrary, a fresh supply was desired by the patients.

"We arrive at the conclusion that a fat has been found in cocoanut butter which meets all hygienic requirements, and which is far superior to animal fat and butter, as well as to any of their other substitutes. Further, on account of its being easily digested, cocoanut butter is particularly well adapted for the use of patients suffering from impaired digestion."

A New Use for Cotton Seed Oil.

In a suitable metallic vessel of something more than one gallon in capacity is placed one gallon of pure cotton seed oil. There are now melted in a furnace in a suitable crucible or ladle twenty pounds of pure lead metal, care being taken that the entire quantity of the lead is in the molten state, which will insure a temperature thereof of not less than 334° of heat Centigrade. In this molten state the lead is then poured gradually in the one gallon of cotton seed oil, care being taken that the mixture is well stirred during the process of pouring, in order that, as far as possible, each molecule of the molten lead will be exposed to the action of the cotton seed oil. In this process of pouring the molten lead, as soon as the hot and molten metal strikes the surface of the oil it follows the law common to all molten metal when thrown in a liquid and separates into very minute globules, the bright and pure surfaces of which are brought in immediate contact with the cotton seed oil, and by the heat therefrom impart such affinity to the cotton seed oil in immediate contact therewith that a certain part of the lead will be absorbed by the cotton seed oil, which, when removed from the influence of the heated globule of lead, will immediately cool sufficient to retain therein the lead thus absorbed. When the entire twenty pounds of molten lead have been thus poured in the gallon of cotton seed oil, it is allowed to remain some little time to cool off, after which the oil is drawn off, and there will be found remaining in the bottom of the vessel in various forms about seventeen pounds of the pure lead, thus showing that in this one process of pouring about three pounds of lead have been absorbed by the one gallon of cotton seed oil. The remaining seventeen pounds of lead is now removed from the vessel, and the gallon of cotton seed oil, that has now about three pounds of lead therein, is returned to the vessel. The remaining seventeen pounds of pure lead is again heated and brought to the molten state, in which condition it is again poured in the cotton seed oil contained in the vessel, the same care being observed in stirring the mixture during the process of pouring as in the first pouring of the metal.

After this second process of pouring the molten lead in the cotton seed oil the mixture is allowed to cool sufficiently, when the oil is again drawn from the vessel, and there will now be found remaining about fifteen pounds of pure lead, thus showing that in this second process of pouring the molten metal two pounds of lead additional have been absorbed by the cotton seed oil, which will now contain about five pounds of lead combined therewith. This process of remelting the remaining lead and again pouring and mixing it with the same cotton seed oil is continued with advantage up to the fifth time of pouring the molten metal, after which the cotton seed oil will be found to have absorbed about ten pounds of the lead, after which there seems to be no further affinity of the oil for the metal. After the cotton seed oil has been brought to this stage it is allowed to thoroughly cool, when its consistency will be about that of ordinary paint. The compound is now in condition to be applied to those surfaces that it is desired to protect against corrosive or deteriorating influences, and may be applied with a sponge or brush, as in the application of ordinary paint. In applying the compound its adhesiveness will cause it to adhere tightly to the surface coated therewith. It is preferred to apply one coat and then allow it to remain about forty-eight hours, during which time it will have become sufficiently hard to resist ordinary abrasion, and after which a second coat may be applied with advantage.

Philip Helbig and Hermann Bertling, of Baltimore, Md., are the authors of this new article and process. They say: It has been found in practice that no other of the known oils, other than cotton seed oil, possesses the quality of absorbing the lead when treated as here-in described, and that the cotton seed oil possesses the

quality of absorbing certain proportions of other metals when poured therein in the molten state in the manner herein described.

As stated, the compound may be employed to protect metallic surfaces of any kind, and is claimed to be particularly useful for coating the bottoms of iron or steel ships to protect the surface thereof from rust and the adherence thereto of barnacles and other marine life. It is likewise of equal benefit for the protection of wooden surfaces that are to be buried in the earth or exposed to the action of water—such as fence posts, piles, etc.

Engineers as Inventors.

The old saying is that there is nothing new under the sun, but for all that some new idea is brought out every day. The field of invention has been pretty well plowed, cross-plowed, and subsoiled, and we are apt to think that there is but little chance further for discovery. The same was thought before the telephone or the electric light made fabulous fortunes for lucky (persistent would be the better adjective) inventors. While not every one can be a Bell, a Brush or an Edison, there is yet ample room for the exercise of all the inventive talent of which any man may be possessed. We do not know that stationary engineers would naturally be placed as inventors above any other class, but we believe that investigation would disclose that a large percentage of their number have devoted much time to invention and that a goodly average have developed inventions which have been more than ordinarily successful. To say nothing of smoke burners, rotary engines, etc., of which almost every engineer has his pet scheme, out of the one hundred and one appliances in the modern steam plant, many of them have been devised by operative engineers.

From the time when Humphrey Potter contrived a harness to move the valves of a pumping engine, in order to save himself labor, down to the present, the occupants of the engine room have been largely instrumental in developing the capabilities of the steam plant. They have the best of opportunity for discovering what improvement will increase its efficiency, make it more convenient or add to its safety. From seeing what is needed to devising ways and means to accomplish it is apparently an easy step, but it is one which involves persistent application and constant study. As an instance of what can be done in this way take the little device which we have seen illustrated lately. An engineer found it necessary to scrape the outside of the tubes in the boiler under his charge. Ordinary tools would not answer. So he straightway devised a little steel hook, and he not only had what he wanted, but what some one else wanted, and which they were willing to pay for. Or take the pump regulator invented by Mr. Campbell and illustrated in our last issue. It is the result of his having observed a want and having studied out a means of meeting it. There are many other wants yet to be met, and it only requires shrewd observation, a good knowledge of common mechanics and persistent effort to make the supplying of these wants a profit to the inventor.—*The Stationary Engineer*.

Test Paper for Acids.

BY S. J. HINSDALE, FAYETTEVILLE, N. C.

Cut white filtering paper of neutral reaction in pieces of about 6 inches square, and impregnate them with tincture of curcuma (1 part curcuma, 7 parts alcohol, and 1 part water). Place the paper on threads to dry. When dry pass a sheet of it through a bath composed of 40 drops of liquor potassæ and 100 c. c. water. Then immediately pass it through a bath of water (flat earthen dishes are convenient for the baths), and at once place it on a thread to dry. As soon as it is dry cut it in pieces and inclose them in tinfoil. The paper will not bear long exposure to light and air, but will keep well if inclosed in tinfoil.

It is much more sensitive than litmus paper, and will detect acid in a mixture of 1 part of hydrochloric acid in 150,000 parts of distilled water, and will detect carbonic acid in spring water. If the water be boiled to expel carbonic acid, and a yellow color is produced, some free acid (besides CO₂) is shown to be present.

The best way to use the paper is to touch it with a glass rod which has been wetted with the liquid to be tested.

The paper can be freshly prepared in fifteen or twenty minutes.—*Amer. Druggist*.

[Note by Ed. Amer. Drugg.—The author has sent us a specimen of the paper. We have tried it, and find it to be all that is claimed for it.]

Large Water Canal.

A portion of the surveys have been completed of the Owens River and Salt Wells Valley Canal in Inyo County. The canal will be 51 miles long, 60 feet wide and 8 feet deep.

An immense storage reservoir will be constructed at Little Lake and other points on the line.

It is estimated that there will be enough water to irrigate all of Salt Wells Valley, and leave a considerable surplus to be carried to the Mojave desert. The company will run a line of steamers in the canal.