Correspondence.

Chinese Taxes on Ginseng.

To the Editor of the Scientific American:

For the information of your readers I wish to correct an error in Consul Nicolas Pike's reply to L. C. Shussar *re* ginseng. American ginseng, clarified, pays an import duty of Hai Kwan taels 8 per picul (133⅓ lb.) Crude ginseng pays a duty of taels 6 per picul. The Hai Kwan tael is equal to $1.53 (Mexican).

J. W. BURKE.

Newchwang, N. China, March 19, 1891.

Facts about the Fertilization of our Fruits.

To the Editor of the Scientific American:

The devices whereby nature would insure the fertilization of our fruits are manifold. The winds are made her "common carriers." Every passing breeze is called into requisition. A banquet is spread for the insect world. There is gorgeous coloring to catch the eye, the sweetest perfumes to lure the smell, and cups brimming with nectar to gratify and intoxicate the taste. But each parting guest on leaving the banquet hall becomes a postal messenger, bearing the loves of the flowers. To the wide circle of relationship of the insect world, of fly and bee and bug and butterfly, there must also be added at least one from the family of birds—the humming bird; the extraordinary fertility of the flora of the isle of Juan Fernandez being credited by the distinguished botanist attached to "her Majesty's fleet of exploration" to the humming birds, who "throng the flowering plants and trees of the island," some varieties of these birds being indigenous.

But with all the precautions which Nature has taken and facilities provided of air, insect, and bird, it remains that some varieties of fruit are defective in their methods and means of fertilization. All of our strawberry growers are made familiar with this fact, as connected with the natural sexual division of staminate and pistillate varieties. The term bi-sexual is applied to the former, though, as is implied, the bi-sexual being self-fertilizing. Yet even here there is a distinction and a difference. Some of the so-called self-fertilizing varieties have their productiveness materially enhanced by the presence of another variety more potent than themselves. The fertility of the Sharpless (a bi-sexual variety) is improved by the proximity of the Jessie or Wilson. It is a familiar fact than many of the bi-sexual varieties are not only *self*-fertilizing, but are of such superior potency, having, as the fruit growers would say, so much pollen as to be available, and as such largely useful in fertilizing the pistillate varieties, which, in turn, properly fertilized, become the most productive. The law of affinities obtains in the vegetable as in the animal kingdom. In the selection of varieties, to obtain the best results this matter of affinity should be considered, plants, like animals, often possessing a stronger affinity for a different strain of blood, as, for instance, with us the Jessie proves the best fertilizer for the Bubach No. 5. Both being large berries and of moderate firmness, for effectiveness every third row set with Jessie being sufficient; and here, to add to the firmness and duration of bearing, Gandy's Prize, a late, firm, potent variety, may be made to alternate with Jessie to advantage; the order then being one row of the Gandy, two rows of the Bubach, and the fourth of Jessie. The principle involved being simply this: that where any variety is wanting in any point, as of productiveness of plant or fruit, of *firmness* of *texture* or *quality* of fruit, we choose for its fertilizer a variety excelling in the point lacking. This matter of family affinities we claim to be a fact of horticulture, and the success of the fruit grower depends largely upon his recognition of this fact. The Warfield No. 2 should be crossed with Burt's Seedling, or what may (of the new varieties) prove still better, the Governor Hoard. For earliness, firmness, and potency as a fertilizer, we would recommend the Michal's Early.

What may be said of the strawberry applies to our native plum—*Prunus americana*—now much improved by culture and careful selection from new seedlings. We find here in some instances the need of a fertilizer, and again the superior potency of certain varieties to be a marked characteristic. Many varieties, like the Winnebago and the Miner singly, are almost worthless; but if set in close proximity with a strongly potent variety, as the De Soto, their productiveness will be assured. In the case (with the plum) of large, vigorous trees, making abundance of wood, but shy bearers, we would recommend grafting in the uppermost branches and extremities of limbs, by either cleft or whip grafting as occasion may require, scions of some potent variety. This, to succeed, should be done as early as possible in the season. The condition of bark and bud of tree and scion should be the same. The plum starts early in the season, and is impatient of delay in the scion.

Many of our grapes are deficient in their productive powers, the flowers not being sufficiently self-fertilizing. Instances are not wanting of this among our native varieties and among our wild grapes; but it occurs more frequently with the hybrids, where some foreign variety (*Vitis vinifera*) has been crossed on some native (*Vitis labrusca*). While soil, situation, pruning, manuring, in brief, thorough intelligent culture, are important factors, we would suggest the use of some potent variety. We instance three varieties, one each of the black, red, and white grapes, whose quality is such as to render them worthy of a place in any amateur collection, yet each shy bearers. For the Moore's Early (black) we would suggest as a fertilizer the Telegraph, also an early black grape and an immense bearer. That noble table grape, the Brighton, a shy bearer, its blossoms apparently imperfect, we believe to be benefited by the near planting and training together on trellis of the Vergennes—a variety possessing vigor of vine with great productiveness. That lovely white grape, the Eldorado, to insure fertility should have for a near neighbor the Niagara or Pocklington.

As to the apple, in the course of our experimenting with seedlings, we have had a curious illustration of this matter of fertilization.

We had drilled in together a quantity of the seeds of the Duchess of Oldenburg and of the Talman Sweet. Of the seedlings, two of each variety were allowed to remain, and they grew up to bearing age side by side. The first to fruit was the seedling of the Duchess, bearing the fifth year from the seed, followed the next year by the Talman seedling. And now for the apparent results of *fertilization*. The Duchess (as is well known), a summer apple, coarse-grained, tart, mainly desirable for cooking; the Talman Sweet, as its name suggests, a sweet winter apple, of finer grain and an excellent baker. The seedling Duchess proved in the main true to the Duchess type as in size and color, shape more conical, less tart, an early fall rather than summer apple, and (unlike the Duchess) a fairly good keeper. These the individual traits of the seedling.

The Talman—in size, shape, color—*perfectly true* to original, even to the freckles on its skin and the raised hemispherical line (the Talman Sweet trade mark). Nothing of resemblance being lacking in externals, even to the minutest particular. But instead of being a winter apple—a late keeper—the seedling has developed a *summer* apple, its grain becoming coarser, and from a standard sweet it has become a sub-acid. Though somewhat inclined to "water core," yet an excellent dessert fruit, an apple "to eat (as the phrase is) out of hand." Its vicinity, when ripe, the most "popular summer resort" on our premises. Here the Talman has evidently been fertilized by the Duchess, either, as we suspect, at a period prior to production of the seed sown or the result of a later cross of these two seedlings at period of blossoming.

J. P. ROE.

Lake Rest Farm, Oshkosh, Wis.

Phosphatic Chalk in England.

The discovery of a deposit of phosphatic chalk in a pit near Taplow has been announced. At the request of the Director-General of the Geological Survey, Mr. Strahan undertook the investigation of the deposit, and laid the results before the Geological Society of London on the 25th of March. The pit from which the original specimen had been collected is old and disused, but has in former years yielded a large quantity of chalk for agricultural purposes. In the lower part it exposes flint-bearing chalk of the usual character, and in the upper part two bands of the brown phosphatic chalk, 8 feet and 4 feet thick respectively, which are separated by 12 feet or 14 feet of nearly white, flintless chalk.

Under the microscope the brown chalk proves to be a purely organic deposit. The fine white mud removed by washing in water consists of some extremely minute bodies common in the chalk, known as rhabdoliths, coccoliths, and discoliths, which, though of doubtful history, are believed to be of organic origin. The brown sand is made up of the following organisms, taken in order of their abundance. First, the shells of foraminifera; secondly, small, crystal-like prisms broken from the shells of the *Inoceramus*, a common chalk mollusk; thirdly, comminuted bones, teeth, and scales of small fish; and, lastly, small oval pellets, the exuviæ of fish, which were probably about the size of sprats. The foraminifera include numbers of genera common in the chalk, such as *Globigerina*, *Textularia*, *Cristellaria*, and *Planorbulina*. They are, generally speaking, filled with an opaque mass of phosphate of lime, the shell itself being sometimes carbonate of lime and sometimes phosphate in a translucent form. The small prisms from the *Inoceramus* shells are also partly converted into phosphate of lime, while the fish remains and the pellets consist, as usual, principally of this substance.

By treatment with acetic acid a portion of the carbonate of lime which cannot be removed by washing can be dissolved out, the phosphate of lime being unaffected by the process. These phosphatized portions of the organisms can thus be separated out from those which have remained in their original mineral condition. In some cases the phosphate has so completely filled the foraminifera that it has penetrated the innumerable little pores, or *foramina*, in the shell, from which these organisms receive their name. In such the removal of the shells by acetic acid leaves an internal cast in phosphate, covered with a short crop of little hair-like processes, each of which is the cast of a foramen.

A comparison of the French phosphatic chalk with that from Taplow establishes their identity beyond doubt. In general appearance they are indistinguishable, while the same organisms, in a similar condition of phosphatization, occur in both. They occupy, however, about the same position in the chalk system. The Belgian deposit is somewhat newer—later, in fact, than any chalk existing in England; but in appearance and composition it closely resembles the English phosphatic chalk. The microscope, however, discloses the difference that in the Belgian rock foraminifera are comparatively scarce, and are not phosphatized. The fish remains are similar in all these chalks; but from the Belgian chalk the remains of a saurian upward of fifty feet in length have been unearthed. This phosphatized chalk is at present known in one pit only in England, and, though search is being made along the outcrop of the same beds, it has not at present met with success.

Saw for Steel.

General Manager Potter, of the Homestead mills, of Carnegie Brothers & Co., has invented a cold saw for the purpose of sawing iron and steel, which has proved a great success, and is creating considerable interest. For some years an instrument has been in use, known as the hot saw, that is, it could only cut metal that had been heated to redness, but it is not equal to the new saw brought out by Mr. Potter. The hot saw leaves a burr on one edge, but the new cold saw does clean, smooth work and is not very expensive.

A Pittsburg *Dispatch* reporter had a talk with a gentleman who had seen the saw at work a short time ago, and secured from him the following description of the new invention: The instrument itself is simply a circular saw of fine steel, tempered somewhat hard and about one-quarter of an inch in thickness at the periphery. It is ground slightly thinner at its center to clear itself easier in a deep cut. It is made to revolve at a slow speed, while the old hot saw was run at a high rate and did its work by means of the intense friction created rather than teeth. It cuts but one inch a minute. The machine differs from the ordinary circular saw in this respect, that it is not the work that moves up to the saw, but the work is fixed stationary and the saw is made to travel along the table through it. It is driven by a worm wheel and screw of some four or five feet in length, along which it can be moved easily by hand-screw gear or by self-acting feed gear. The saw runs in a tank of solution, and the greatest care is necessary in regard to the quality of the materials in this solution. It is made up of ten pounds of whale oil soap, fifteen pounds of sal soda, two gallons of lard oil, with water added to make forty gallons of mixture. The new saw will be used in cutting the armor plates for the government the proper size.

Russian Mercury.

Among the articles of export from Russia which are now beginning to attain a certain importance are quicksilver and phosphorus. Until quite recently Russia obtained all the quicksilver consumed by her from abroad, but since the commencement of exploitations of the mines of Bakhmut, Russian mercury is not only ousting the foreign article from the local markets, but it has become an article of export. In 1887, 7,803 poods of it were exported from St. Petersburg and Libau. In 1889, 3,150 poods of phosphorus were also exported.

The mercury mines of Saigewa, near the Nikitowka Station of the Azof Railway, prove to be exceedingly rich. The deposits contain three layers of hydrargerous ore, the total quantity of ore containing the metal being estimated at 12,000,000 poods. The ore is sprung by means of dynamite, crushed by manual labor and by crushing machines, and finally roasted. In 1889 the yield of the mines was 10,202 poods of pure metallic quicksilver. In working the deposits, traces of former workings and abandoned pits are found, showing that these same mines have already been exploited in ancient times.

Milton's Homœopathy.

Irrespective of one's views as to the several schools of medicine, it is interesting to note the fact that the poetical mind of John Milton anticipated the theory of Hahnemann, as is evinced by the following extract from his preface to "Samson Agonistes." He remarks that tragedy has power, "by raising pity or fear or terror, to purge the mind of these and such like passions; that is, to temper and reduce them to just measure with a kind of delight, stirred up by seeing those passions well imitated. Nor is nature wanting in her own effects to make good this assertion; for so in physic things of melancholic hue and quality are used against melancholy, sour against sour, salt to remove salt humors." I do not remember ever seeing this Miltonic statement of "Similia similibus curantur" commented on before.

H. C. HOVEY.