

A HISTORY
OF
AMERICAN GINSENG
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A Thesis Submitted for the Degree of
Bachelor of Science

UNIVERSITY OF WISCONSIN

1910

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Chapter I.

Ginseng Before its Discovery in Canada.

"Sorcerer wizard and quack,
Live by the sense we lack."

From the beginning of time to the time beginning, man has been the dupe of his own imagination. The story of witchcraft, the history of astrology, the course of many patent medicines prove it. But nothing proves it more conclusively, than the Orientals' conception of ginseng.

This modest forest herb, which medicinal practitioners of occidental civilization consider of little or no therapeutic value is regarded by the great oriental races as a remedy of unexcelled virtue. We are told that in Manchuria, ginseng is believed to render the patient unconscious for three days and ill for a month after which he recovers and lives in perfect health for 90 or 100 years. Another writer describes the manner in which the occidental potentates take this medicine as follows: "The patient retires to a garden where his senses are soothed by listening to music, the song of birds and the bubbling of a flowing

(1) United States Dispensatory, page 1602-1603.

American Cyclopedia, 7: 816.

(2) Scientific American 57: 23704-5

American Journal of Pharmacy 1890 pages 282-284.

(3) Dublin Review, 117: 164-165.

(4) Chambers Journal, 72: 359.

stream and enjoying the balmy breeze. He avoids everything likely to trouble him and will not even open a letter lest it should contain bad news. Continuing, the writer says, "Some grandees of Central Asia go through a course of forty days of this pleasant regimen every second year."

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Another wondrous tale comes from the Chinese province of Quantung, where the natives believe the plant is enveloped in a halo of light visible only to certain favored individuals and in the hours of darkness. When the light is seen from afar, the selected ones like the shepherds of old follow it until it sets over the object of their quest. There they remain until dawn, and with the first rays of the rising sun the precious roots are removed from the soil.

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Other orientals tell other tales. "One is that some plants have a berry or two situated an inch or more above the regular cluster, which indicates a point of the compass and which direction, if followed, will seldom fail to locate another root a few paces distant; others are that the root has the power to travel from place to place underground; that it will restore the circulation and respiration after life has deserted the body; that it has the power to conceal itself to evade capture; and that God has appointed the wolf,

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(5) Dublin Review, 117: 164-165.

(6) Scientific American, 57: 23704-23705.

(7) Ibid.

(8) Ibid.

tiger, leopard and snake to watch over and protect it. Such in brief, are a few of the credulous narratives told of this herb, commonly called Ginseng botanically termed *Panax quinquefolium* and morphologically known as a member of the Araliaceae family.

When its real history began we do not know. It is mentioned in some of the earlier Chinese works and has long been styled the fabled root of antiquity. A German author writing in 1787 believed it to be the mandrake of the Bible. Other writers and students of Biblical history take the same view, while still others claim that with respect to Ginseng the Bible proves nothing.

Be this as it may, we positively do know that over four hundred-million Asiatics have an unshaken faith in its cures. It is no great stretch of imagination to believe that while Ninevah and Babylon were learned in arts, letters and law, while the Acropolis was still covered with a virgin wilderness and the Tiber, a wild woodland stream, flung its free waters into the blue Mediterranean, that off in the dreamy-eyed Celestial Empire ginseng held sway over the minds of men

(9) Philosophical Transactions of the Royal Society of London, 28: 240.

Pharmacographia, Fluckiger and Hanburg, page 73.

(10) Scientific American, 57: 23704-23705.

(11) Ibid.

as today. Even now, amid our twentieth century civilization in China, the penalty for any one who hunts ginseng without a government permit is death. In payment for a single root of rare quality as high as \$2000 has been recorded. Only two centuries ago, in Peking, ginseng was worth its weight in gold. Is it any wonder then that men of the Occident with their minds ever alert to commercial gain should scour the remotest corners of the earth in search of it? Is it any wonder that Father Lafitau and his brethern sent out to the wilds of Canada to save the souls of savages, should pause in their holy labors to search for and garner the celestial weed?

In his "Memoire concernant la precieuse plant du ginseng," addressed to the king of France and published for the first time in 1758, Father Lafitau states that he obtained his first knowledge and interest in Ginseng through reading a letter from Pere Jartoux, a French missionary to China. In this letter, Jartoux gave a detailed description of the plant which he had occasion to examine during a journey made through Turkestan in the year of 1709. Incidentally, he mentioned the fact that if it was to be found on any other

- (12) Chambers Journal, 72:359.
- (13) Dublin Review, 117: 164-165.
- (14) Popular Science Monthly, 39: 546.
American Cyclopedia, 7: 816.
- (15) Memoire Concernant la Precieuse Plant du Ginseng, page 22.

part of the globe the most natural spot was southern Canada, which was in the same latitude and had much the same climate as Turkestan. Being of a botanical turn of mind, Father Lafitau was deeply impressed and states that he was filled with a hope that he might find it in New France. But as winter was close at hand, nothing could be done immediately. With the arrival of spring, however, and with new vegetation, he began the search which lasted three months. He tells us that he made many inquiries concerning it among the Indians but without success. Finally one day when he was the least expectant, he was suddenly attracted to it by the bright red color of its fruit.

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Continuing his manuscript he writes, "Carefully pulling it up, I carried it to an Indian woman, whom I had employed to look for it. She recognized it at first as one of their ordinary remedies and told me at once what use the savages made of it. After telling her how the Chinese estimated it she cured herself with it the following day, of intermittent fever, which had troubled her several months. She made no other preparation than to drink cold water in which some of the roots crushed between two stones had been soaked. Since then she has twice done the same thing and cured herself immediately each time."

Digressing further on the medicinal properties of ginseng, Father Lafitau states that the Indians told him that

(16) Ibid, page 14.

they used it to purge infants but that it was not strong enough to purge older persons. They also used it to revive the appetite. Concerning his own experiences with it, he declares it cured him of rheumatism and a hemorrhage. (18)

Having made an exact description of the plant discovered, he sent it to a botanical friend in Quebec. This friend having read his description took the Jartoux letter which he had in his possession as well as a rude wood cut of the ginseng plant and went up to Lafitau's mission among the Iroquois, which was three leagues west of Montreal. Together the two men studied the plant and quickly confirmed Lafitau's earlier suspicion that this was the real ginseng. Thus it happened that in 1716 ginseng was discovered as such on the western continent. (19)

In Rhind's, "History of the Vegetable Kingdom," published in London in 1855 there is the statement that twelve years before Lafitau's discovery, Michael Sarrazin, King's physician for Canada, discovered ginseng near Quebec and sent specimens to Paris. Lafitau also speaks of the discovery and mentions Sarrazin with great respect. He declares, (20)

(17) I bid, page 49.

(18) I bid, page 50.

(19) I bid, page 16.

(20) Scientific American, 57: 23704-23705.

however, that Monsieur Sarrazin did not know the plant as ginseng and sent it under the name of Aralia one specimen of which, and so labeled had been placed in the herbarium of the then celebrated botanist, M. Vaillant. We do not know that Lafitau was telling the truth. His statement so far as known, however, has never been contradicted. Further more, King Louis XIV in his decree of February 18th, 1718 granting him the right to publish his memoire, speaks of him as the discoverer of ginseng in America. This view has been held by practically all writers ever since that time.

Shortly after his find in the summer of 1716, Father Lafitau sent some specimens of ginseng by Pere le Blanc to the king of France. The king immediately took a lively interest in the new herb and had Monsieur de Jussien transplant some of the roots to the Royal Garden. Other specimens preserved in spirits of wine were sent to Paris for exhibition. From this time on American ginseng was definitely known to the western world and rapidly became an object of commercial gain.

(21) Memoire Concernant la Preciesue Plant du Ginseng, page 44.
 (22) Ibid, page 91.
 (23) Ibid, page 66.

Chapter II.

Ginseng Traffic in Canada.

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Soon after Father Lafitau's discovery the French through the agency of the Indians were collecting ginseng for export to China. In Quebec, the root sold for two francs per pound and brought twenty-five francs per pound in China. But the price rapidly rose and soon large numbers of people were interested in its collection.

In writing of his travels through Canada in 1794, Peter Kalm, the Swedish botanist says, "During my stay in Canada, all the merchants in Quebec and Montreal received orders from their correspondents in France to send over a quantity of ginseng, there being an uncommon demand for it this summer. The roots were accordingly collected in Canada with all possible diligence. The Indians especially traveled about the country in order to collect as much as they could and to sell to the merchants at Montreal. The Indians in the neighborhood of this town were likewise so much taken up with this business that the French farmers were not able during that time to hire a single Indian as they commonly do to help them in the harvest. Many people feared lest by continuing for several successive years to collect these plants without leaving one or two in each place to propagate their species, there would soon be very few

(24) Ibid, page 22.

(25) Scientific American, 57: 23704-5, Also, Kalm's En Resa del Norra Amerika.

Extinct

of them left, which I think is very likely to happen, for by all accounts they formerly grew in abundance around Montreal; but at present there is not a single plant of it to be had, so effectually have they been rooted up. This obliged the Indians this summer to go farther within the English boundaries to collect these roots." (26)

Up to the time Kalm writes of, any one could export ginseng from Canada. But owing to the fact that the price had risen from two to twelve francs per pound and the volume of ginseng exportation had also largely increased, the French East India Company endowed with monopolistic powers saw fit to exercise its right of exclusion and in 1751 all other traders were shut out from the Canadian ginseng commerce. (27) The demands for ginseng became so insistent and the supplies to be had became so depleted through ruthless gathering that the price soon rose to thirty-three francs per pound and in some localities the plant having become absolutely extinct could not be had at all. In fact when anything failed, a common expression of the settlers was, "C'est tombe comme le ginseng." (28) It has gone down like ginseng.

(26) Ibid.

(27) Popular Science Monthly, 39: 546.

(28) Ibid.

Extm

In 1752 the merchants at Rochelle directed their agents to purchase ginseng at any price. In their zeal to obey orders, the agents caused a large amount to be collected out of season and this was improperly dried in ovens. Even this poor product sold for twenty-five francs per pound in Quebec and a quantity amounting in value to 500,000 francs was shipped to Rochelle. Part of this was sent to China, where the people refused to use it. This business transaction gave the Canadian root a bad reputation among the Chinese and as the result by 1754 the trade had declined in value to thirty-three thousand francs and soon entirely ceased.

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As to where ginseng grew most abundantly in Canada, Father Lafitau said it was his belief that it grew more commonly south of the St. Lawrence river than north of it. He declared, however, that at one time it was quite plentiful at Montreal and Ottawa and in the neighborhood of Lake Huron, but that he never was able to find much in the province of Quebec. He adds that it was found in large quantities in the land of the Five Nations and he had little doubt that when the Flemish of New York had discovered it they would make a great profit - a prophecy which in due time came true.

One would naturally think that the English, who are a commercial people would have become interested in the ginseng

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(29) Memoire Concernant la Precieuse Plant du Ginseng, pages 5-8.

(30) Ibid, page 55.

traffic but the only evidence to that effect is found in Peter Osbeck's, "Voyage to China and the East Indies," written in 1771 in which he says that at that period ginseng was sold in the apothecaries' shops of England under the name of "Ninse" every ounce of which was worth thirty or forty ounces of silver.
(31)

The only other European Nation to take an interest in this plant has been Russia. We find that as late as 1859, a scientific expedition was organized in St. Petersburg to explore and report on the Mantchou territory and the frontiers of Korea and to examine especially the ginseng and the Chinese plantations with a view of establishing plantations in Russia for the purpose of trade with China. (32) Apparently little resulted from this expedition, for Russia has not yet begun to export ginseng to China. It remained for the ingenuity of the Yankee to turn ginseng to large account and profit.

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(31) Scientific American, 27: 23704-5, Also, Osbeck's Voyages to China and The East Indies, Vol.I.
(32) Year Book of Pharm. and Transactions of the British Pharmaceutical Society.

Chapter III.

Ginseng in the States.

12

During his travels through North America in 1802, F. A. Michaux wrote that ginseng was found from beyond the northern most boundaries of the United States as far south as the state of Georgia, which comprises an extent of 1,500 miles. It grew, he observed, chiefly in the Alleghanies and was by far more abundant as the chain of these mountains inclined to the south-west. It was also to be found in the environs of New York and Philadelphia as well as in that part of the northern states situated between the mountains and the sea." (33)

Samuel Williams in his history of Vermont published in 1794 states that ginseng was recognized in the western part of New England in 1750 and that in 1751 it was discovered in central New York and at Stockbridge, Massachusetts. Reverend William Speer says that in the early days of Vermont history ginseng sold for as high as thirty-four cents per pound. In a letter to Governor Clinton dated July 24, 1753, Col. William Johnson writes that three days previously he had come

(33) Thwaite's, Early Western Travels, 3: 204.

(34) Thompson's History of Vermont, page 221.

(35) William's Natural and Civil History of Vermont, page 70.

(36) Speer's Oldest and Newest Empires, China and the United States, page 61.

upon a company of Frenchmen at Onondaga, New York purchasing
 (37) ginseng from members of the Six Nations. On July 23, 1766,
 just thirteen years later lacking one day, we find this same
 Colonel William Johnson requested by chief Deiquande, during
 an Indian white conference that he permit the Frenchmen trading
 there in ginseng to go among the Onondagas, Oneidas and along
 (38) the Oneida Lake. Evidently, during these early years the
 Indians of New York found the ginseng trade profitable.

As population moved westward, ginseng was met in abun-
 dance as far as the first tier of states beyond the Mississ-
 (39) ippie river. An export trade was eventually developed, which
 in Wisconsin is said to have reached a value of \$40,000 in
 1858 and \$80,000 in 1859. We are told that, "buyers from
 abroad located their agents here and authorized them to pay
 good round sums for the article, which could be found growing
 wild in many sections of the state bordering on the streams
 and particularly throughout what was called the "Big Woods"
 (40) located from forty to fifty miles west of Minneapolis.
 It grew quite extensively in lands drained by the Crow river

(37) Colonial History of New York, 6: 807-8.

(38) Ibid, 7: 864.

(39) Thompson's History of Vermont, page 221.

(40) Minnesota Pioneer Sketches, page 201.

in the vicinity of what is now Delans and it was no uncommon thing to see twenty or thirty men, women, Indians and even boys coming into town each with a pillow slip or bag containing from half a pound to ten pounds of this herb."

In a letter of July 1st, 1859, published in the American Journal of Pharmacy of 1859, Dr. William H. Stevens of Fairbault throws interesting light on the ginseng trade of pioneer Minnesota. He says, "that portion of our state where it is most to be found is in what are termed the Big Woods lying between the town of Fairbault on the east and on the south bend of the St. Peter's river on the west and from that line extending down the river in the direction of St. Paul. The distance across this timber from Fairbault to Mankato is about forty miles. The points at which the trade has been carried on chiefly, are Fairbault, Mankato and St. Peter's. Small places in the timber and on the St. Peter's river have done something, but these principally.

The amount of dried root that has been shipped from this place as I can learn has been between twenty-one and twenty-two thousand pounds and that sent from different points along the St. Peter's to St. Paul has not exceeded eighteen thousand pounds."

"The expectation of large shipments being made to the

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(41) American Journal of Pharmacy, 31: 480.

cities on the seaboard has had the tendency to depress the market price there and that in turn has had the effect to entirely stop the trade throughout the state."

Concluding he remarks, "The green root has commanded prices varying from six to ten cents and in a few instances, even more. It takes from four to four and one-half pounds of the green to make one of dry."⁽⁴²⁾

This letter from Dr. Stevens is interesting not only because it throws light on the scope of the ginseng trade of pioneer Minnesota, but also because it points out a fact of vital significance to the present day ginseng grower and trader, viz; a glut in the ginseng market long before the cultivation of ginseng in the United States had even been thought of.

As a supplement to this letter of fifty years ago concerning the ginseng trade of Minnesota, it is interesting to read the signed statement of a Mr. Burnett, a ginseng trader, which appeared in the Minneapolis Journal during February, 1907 in which he says, "There has probably been marketed in Minneapolis this last year \$50,000 worth of wild ginseng."⁽⁴³⁾

Concrete knowledge concerning the ginseng business during the pioneer days of the United States is hard to obtain, but occasionally a fugitive fact is unearthed and there a ray

(42) Ibid.

(43) Minneapolis Journal, Feb. 1907.

of light penetrates the events of forgotten days. The following item from the Druggists Circular and Chemical Gazette of March, 1905 illuminates in some slight degree the ginseng trade of early Indiana. It reads, "Old timers say there was a time when Indianapolis had a "sang" factory, the work of which was to clean and clarify the roots preparatory to their shipment to China. The plant grew very abundantly in central Indiana in those early days of plenty of shade and moist soil and the factory for a time was among the leading industries of the capital city."⁽⁴⁴⁾

Another old publication, the Navigator of 1811, on page 295 has this interesting statement: "We find that according to the books of Nelson Wade and Great Singer, a transportation firm, the amount ginseng conveyed on the Ohio from November 24, 1810 to Jan. 24, 1811 was twenty barrels."

That ginseng was earnestly and persistently sought after by early traders is shown by the following want ads. which appeared in the Pittsburg Gazette, the first of which appeared on July 28, 1786 and read as follows:

Ginseng.

A quantity of good ginseng wanted by the subscribers for which a generous price will be allowed in merchandise.

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(44) Druggists Circular and Chemical Gazette.

It must not be dried in an oven or in any manner that will dry it too quickly; the roots must be kept as whole as possible.

Daniel Britt and Co., Contractors, Pittsburg,

July 28, 1786.

Another want ad, this time by Robert Brown appeared in the same newspaper on April 21, 1787 and read thus:

"Ginseng wanted, for which half will be given in cash and the other half in goods."

We find also that the ginseng business reached into Tennessee. On page 218 of his manuscript, M. A. Michaux speaks of the Cherokee Indians of Tennessee bartering ginseng with the white traders. Later in his manuscript he indicates that the chief center of this trade was at Fort Blount. (45)

He further remarked that there was not a single species of colonial produce in Kentucky except ginseng, that would bear the expense of carriage by land from that state to Philadelphia. Ginseng was still quite plentiful in 1802 in Kentucky, but he said a man could not pull above eight or nine pounds of fresh roots per day. (46) In connection with this statement of a century ago it is interesting to read what a trader, whose territory included southern Ohio, western Pennsylvania, West

(45) Thwaite's Early Western Travels, 3: 204.

(46) Ibid.

Virginia and Northern Kentucky and who did his purchasing from 1892 to 1897 has to say. At one time a man with whom he dealt had 3000 pounds of wild ginseng and it was no uncommon thing he said to see lots of from 100 to 500 pounds. He estimated the production of wild ginseng in this region at 100,000 pounds annually. (47)

Another buyer for a Charleston, West Virginia house writes that "some years good wages were made in this region at digging wild roots but for the past few years digging has been so persistent that when a digger makes from one to two dollars a day he thinks it is good." (48)

The above facts are all the knowledge we have concerning the early history of Ginseng in America and as American ginseng in its wild state is all this paper proposes to deal with, the discourse naturally ends at this point. It hardly seems fitting, however, to turn away without looking before us and asking the question, What of the future of ginseng? To answer this it is necessary first, to ascertain whether ginseng possesses any qualities, which are likely to ever create a demand for it in Occidental medicine and, second, will the Chinese demands for the root warrant the great efforts, which are now being put forward to produce the root by cultivation as well as by forest searching? The answer to these questions will be taken up briefly in the few succeeding pages.

(47) Harding's Ginseng and Other Medicinal Plants, page 127.
 (48) Ibid, page 128.

Chapter IV.

The Future of American Ginseng.

19

Despite the fact that ginseng was official in the Pharmacopea from 1840 to 1880 there has never been much of a demand for it by American physicians. Occasionally one praises it, but only occasionally. At the 1907 meeting of the Michigan Ginseng Association, Dr. H. S. McMaster of Cass county presented a paper on the uses of this plant in which he said (49) in part, "Ginseng is a wild non-poisonous plant, well adapted to domestic as well as professional uses. In this respect it may be classed with such herbs as bonset, oxbalm, rhubarb and dandelion. The medicinal qualities are known to be a mild tonic, stimulant, nervine and stomachic. It is especially a remedy for ills incident to old age. Two well known preparations made from ginseng root are on the market. One of these, called "Seng" has been for many years on druggists shelves. It is sometimes used for stomach troubles and with good results. Another called "Ginseng Tone" is a more recent preparation and is highly spoken of as a remedy."

But these preparations have not been so efficacious as to attract attention. In fact drug stores, which once carried them, no longer carry them. (50) As the last United States Dispensatory has said, "ginseng has little use in medicine and is only kept on the shelves of drug stores because certain

(49) Harding's Ginseng and Other Medicinal Plants,

(50) Bobb's Pharmacy, Madison, Wis. (page 136.

people have acquired the habit of chewing ginseng root."

Even the most persistent efforts of scientific men in recent years have failed to reveal in ginseng a medicinal value equaling in the slightest degree the qualities ascribed to it by the Chinese. According to the investigations of M. J. Galjalo (51) in 1906 the active constituents of ginseng root are nearly related, partly to spearmin and partly to colanine. In fact, he says, one of these active constituents may be regarded directly as colanine. The physiological action of the constituents of ginseng he says manifest themselves by depressing the hearts action, causing languor, drowsiness and insensibility. The "pauakvilon," which was first observed by Garregues in 1854, Galjalo regards as belonging to the inactive components of the drug, its action being confined to the gustatory nerves. Even these latest investigations of Galjalo fail to clothe ginseng with the super-natural powers ascribed to it by the Chinese. It is quite probable, therefore, that if ginseng is to play an important role in the materia medica of the future it must be in the materia medica of the Chinese and allied peoples. The demand for it is likely to come neither from Europe nor from America, but from the far East. The only remaining question then is, will this eastern demand be

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(51) Pharmaceutival Zeitung, No. 73, page 766.

Proceedings American Pharmaceutival Association,
56: 219.

strong enough to create among American people a steady interest in the production of ginseng. The following statistics will help to answer this question.

<u>Year</u>	<u>Pounds Exported.</u>	<u>Average Price per lb.</u>
1858.....	366,055.....	.52
1868.....	370,066.....	1.02
1878.....	421,395.....	1.17
1888.....	308,365.....	2.13
1898.....	174,063.....	3.66
1908.....	144,533.....	7.26

The striking fact to be deducted from these figures is that while the amount exported has fallen off a little over fifty percent in fifty years the price offered has increased over 1300% during that time. Consequently it is quite likely that even though the cultivation of ginseng becomes thoroughly practicable, many a day will come and go before a glut occurs in the ginseng market. We must conclude, therefore, that this plant which has had such a remarkable career, intertwined as it were with the pioneer history of America, will not disappear with the fading of the forest but will take up a new abode beneath the lattice shade of man's construction

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- (52) U. S. Census Reports.
 Harding's Ginseng and Other Medicinal Plants,
 page 97.
 U. S. Department of Agriculture Reports,
 No. 16, page 12.

and will continue in the future, as it has done in the past,
to be the yellow man's hope and the white man's profit.

B i b l i o g r a p h y

- American Cyclopedia,
Vol. 7, N. Y., 1902.
- American Journal of Pharmacy,
Vols. 31 and 32, Philadelphia.
- Chambers Journal,
Vol. 72, London.
- Dublin Review,
Vol. 117, London.
- Fluchiger and Hanburg, Pharmacographia,
London, 1874.
- Harding, A. R. Ginseng and Other Medicinal Plants,
Columbus, Ohio. 1908.
- Kalm, Peter, En Resa dil Norra Amerika,
Abo. 1753.
- Kraemer, H., Botany and Pharmacognosy,
Philadelphia, 1909.
- Lafitau, T. F., Memoire Concernant la Precieuse Plant
du Ginseng,
Montreal, 1858.
- Navigator,
Pittsburg, 1811.
- O'Brien T. J., Minnesota Pioneer Sketches,
Minneapolis, 1904.
- Osbeck, Peter, Voyages to China and the East Indies,
Vol. 1, London, 1772.

- Pharmaceutical Era,
Vol. 6, Detroit, 1891.
- Pittsburg Gazette, Pittsburg,
July 28, 1786 and April 21, 1787.
- Popular Science Monthly,
Vol. 39, New York.
- Proceedings American Pharmaceutical Association.
Vol. 56, Philadelphia, 1908.
- Rhind, J., History of Vegetable Kingdom,
London, 1855.
- Royal Society of London,
Vol. 28, London, 1714.
- Scientific American,
Vols. 53 and 57, New York, 1902.
- Speer, Rev. William, The Oldest and Newest Empire; China
and U. S.,
San Francisco, 1870.
- Thwaite's R. G., Early Western Travels,
Vol. 3, Cleveland, 1904.
- Thompson, Z., History of Vermont,
Burlington, 1842.
- U. S. Department of Agriculture,
Bulletin 16, Washington, 1891.
- U. S. Dispensatory, Ninteenth Edition, Philadelphia.
- Western Druggist,
Vol. 13, Chicago, 1894.

Williams, S., Natural and Civil History of Vermont,
Burlington, Vt., 1809.

Year Book of Pharmacy and Transactions of the British Phar-
maceutical Conference,

London, 1871.

ACCEPTED

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June 7, 1910.