DEPARTMENT OF AGRICULTURE, VICTORIA.

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MR. JAMES M. SINCLAIR

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PRESERVATION OF FRUIT FOR SHIPMENT.

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ROBT. S. BRAIN, GOVERNMENT PRINTER, MELBOURNE.
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THE PRESERVATION OF FRUIT FOR SHIPMENT.

Victoria is rapidly becoming a large fruit-producing country, and from the variety of soils and climate within her territory, this industry is capable of unlimited expansion, if an export trade could be opened up to make it profitable. Efforts have been made to send fruit to London, but, with the exception of apples, only with a moderate degree of success, and no certainty that even these would arrive in good condition. The shipment of grapes, apricots, peaches, and oranges so far have resulted in failure. Whilst, however, we have been content to make our shipment trials only by means of refrigerator chambers, on the other side of the Pacific experiments have been made in another direction to secure the preservation of fruit during transportation. These efforts have been crowned with success, and by utilizing a simple law in nature, a further stage in the progress of development of our so-called civilization appears to have been arrived at.

When in San Francisco in September of last year, the secretary of the State Board of Horticulture, Mr. Lelong, mentioned to me that a discovery had been made of a new method of fruit preservation by means of sterilized air, by Dr. Perkins, of Alameda. He informed me that he had taken the deepest interest in the experiments which had been carried out by Dr. Perkins (who is a member of the State Board of Horticulture, and also a fruit-grower), and was satisfied that they were a success. He also stated that two scientific gentlemen—Professor Hilgard, of the California University, and Professor Smith, of the Standford University—had been appointed from the Board to investigate the process, and had reported on it in the most favorable terms. From what Mr. Lelong stated, and knowing the value to Victoria of any discovery which would enable us to ship fruit to Europe, I went and saw Dr. Perkins, and had three lengthy interviews with him respecting his method.

Dr. Perkins is at present an Episcopalian minister at Alameda. I found him to be a gentleman of high scientific attainments. As a proof of which he has been honoured by the Academy of Science in Paris creating him a member, and sending him also a gold medal in recognition of his merit as an inventor. He informed me that in early life he was a civil engineer in New York. He had also been consulting engineer to one of the largest bridge-building companies in the United States.

For over seven years he had been engaged in conducting experiments for the purpose of discovering a method of preserving fruit. When he described his investigations and experiments in endeavouring to solve the question, and afterwards minutely detailed the principles on which the process is based, one could not but feel satisfied that the solution of the problem had been undertaken by a gentleman eminently qualified for it.

I will now give his own description of the process, the principle consisting partly in the sterilization of the air in which fruit is kept through compression, and partly in the lowering of the temperature by the subsequent expansion of this compressed air. In the mechanical compression of air, if sufficient force be applied, its temperature may be raised to 200 degrees, or even 240 degrees, according to the extent of the power employed. The great heat has a germicidal effect. The microbes or living germs which induce the decay of the fruit or other perishable substances are thus destroyed. When the imprisoned air is relieved from pressure the resulting expansion rapidly lowers the temperature. It is even practicable by a sufficient concentration of the force of compressed air to induce actual freezing of a body exposed to an escaping jet. Dr. Perkins' method, allowing the compressed air to expand in a fruit car or other confined space, is claimed to be practicable in maintaining a temperature of 45 to 60 degrees in the hottest weather, with a constant circulation of dry sterilized air through the chamber.

The doctor supplemented this with the following additional information:—

The Perkins sterilized dry-air process for the conservation of fruit, vegetables, &c., is the result of experimental study, and is the development of natural laws by mechanical methods. Instead of keeping the products in a close chamber, with a moist air and low temperature, they are placed in a continuous current of dry air at a normal temperature, or between 45 and 50 degrees Fahrenheit. The process is therefore diametrically opposed to refrigeration. The basis of action is on the prime factors of decay, which in fruit are a given percentage of sugar and acid, with a known degree of temperature and humidity, and in connexion with these the vitalizing and growth of the fungoid spores. These have been carefully studied. Other factors, viz., the electrical influence, &c., will be developed later. In illustration, the development of decay in fruits of fine tender flesh, rich in fruit juices, as the peach or apricot, is the action of the sugar and acid in fermentation, causing an exudation of moisture to the surface. Under a high temperature this is rapid, especially if the atmosphere is humid. This exudation is essential to the vitilization of the resting spores, and in fruits carrying a high percentage of sugar is correspondingly vicid, catching and retaining the floating spores in the atmosphere.

The proper conservation of fruits requires a process which will produce the proper temperature to retard fermentation, a dry air to absorb the moisture, and a sterilized air to destroy the germs of fungoid growth, at least to devitalize those that may have formed the union of the hyphea, and to thoroughly sift and destroy the floating spores. The process of refrigeration reducing the air to a low temperature, either by ice or chemicals, with a large degree of humidity, and sealed in a tight chamber, is imperfect

and expensive. It is imperfect because the germs of the mycelium will vitalize and spread their seeds with more or less rapidity, even at a low temperature. It is imperfect because the continuous exudation of carbonic acid gas from a body of fruit in a sealed chamber becomes stale and decaying, and will ultimately destroy the flavour, though the fruit itself may not decay. It is imperfect because the germs once vitalized, even in a low temperature, are a source of danger and disease, injurious to the weak stomachs of children and invalids eating such fruit without removing the skin.

A dry sterilized air process obviates all these faults, and conserves the fruit in perfect condition for a longer period of time than refrigeration. To cite one instance. Table grapes that were found unsafe to ship, because of excessive moisture and low percentage of sugar, in consequence of unusual rains the previous winter, and that would not bear ten days' transit by refrigeration, were by this process kept in good condition nearly three months. The mechanical means for perfecting the process are simple and inexpensive. The principal effort has been in adapting it to the long carriage across the continent, through a varied climate, over long stretches of desert, mountain, and plains.

There is little doubt of its successful application to ocean service with some slight changes. While it was originally intended for fruit transportation, it is almost certain to be adapted to other perishable articles in transit. The claim is not made, nor is it intended that this process is to supersede refrigeration, but simply that some products will have longer life and carry better than under the present methods of transportation, and that the system is thoroughly economical.

Dr. Perkins informed me that the grapes preserved by the process for three months had retained their crispness and bloom as when cut. He showed me samples of grapes and cherries which had been preserved by it for three years, and although the skin on them, from re-exposure to the ordinary atmosphere, was a little shrivelled, yet the juice of the fruit was present. Vegetables had also been kept for a long time by it.

The reason why the process has not received a practical trial in sending fruit to the eastern States requires explanation. California is distant from New York, by rail, about 3,200 miles, and from Chicago over 2,000 miles. The principal markets for the fruit crop exist in these and other great cities of the eastern states. All Californian fruit not canned or dried locally has to be forwarded by rail to the places referred to. In its transit across the continent, extensive deserts have to be crossed, where the heat is so great in summer that, if the fruit were carried in ordinary cars, it would be desiccated and unsaleable on arrival at its destination. All fruit, therefore, has to be carried in refrigerating cars, which carry on average 10 tons of fruit each. In the journey across to New York 15 tons of ice per car are used.

The Southern Pacific Railroad Company, owning nearly 5,000 miles of lines, own all railroads going out of California, south and eastward, also nearly all the internal lines of that state. It, therefore, has a monopoly of the fruit traffic. In addition to this, the company controls the whole ice supply of California. This is all natural ice, obtained from the Sierra Nevada mountains. The company's line going east to Ogden crosses these mountains and at certain points they have great storehouses, where the winter ice is gathered and kept for summer use. All the ice for the supply of the refrigerator cars is obtained from this source, the Southern Pacific making a large profit out of the sale of it, as, strange to say, this class of car is owned by a separate company or corporation, which pays the other one a certain sum for the haulage of them. All fruit, therefore, sent east out of California had to pass over the Southern Pacific Company's lines, and as they were making a profit out of the supply of ice to the refrigerator car-owners it was not to be expected that they would go very far out of their way in the direction of assisting in the introduction of an innovation which would dispense with the use of ice. The refrigerator companies had also a large amount of capital invested in their cars. As long as the fruit-growers in California could stand the refrigerator rates, and send on their produce, no very great amount of attention was likely to be given by them to an invention or discovery like that of Dr. Perkins. On the other hand, fruit-growers, while recognising the great benefits which would accrue to them by the introduction of Dr. Perkins' system for preservation and transportation of their produce, were quite powerless, no other railway but the Southern Pacific being available. Their recognition of the efficiency of the Perkins process, even when it was in an earlier stage, and the fruit preserved only in a stationary chamber, may be inferred from a resolution passed at the Fruit-growers' Convention in San Francisco in the early part of last year. The resolution was as follows :—*Resolved*—"That we have heard with great interest the system devised by Dr. Perkins for the transportation of fruits to secure its delivery without impairment of freshness, flavour, and appearance, and we hereby express our appreciation of the merits of the system, and this Convention earnestly requests the several railroad companies to examine it, and to adjust their service cars to facilitate the experiment, believing that the system may prove an efficient means of securing a better market for our fruit."

I may also state that, subsequent to interviewing Dr. Perkins, when visiting a number of great orchards, each varying from 250 to 1,640 acres in extent in California, I questioned the managers and proprietors with respect to their opinion of the merits of the Perkins process, and in every case it was favorably spoken of and referred to as the coming system for fruit transportation and preservation. Mr. A. T. Hatch, the largest fruit-grower in the world, owning nearly 5,000 acres of orchards,

informed me that he had critically watched and examined Dr. Perkins' process, and was so perfectly satisfied of its success that he was making every effort to have it utilized for the transportation of Californian fruit east, and also to London. He had just a week or two previous to my interview with him sent several car loads of fruit across the continent to New York, and thence shipped to London. Although the fruit arrived in fair condition and sold well, yet the great charges for refrigeration on the railroad prevented any profit being realized.

The refrigerator cars weigh 21 tons each, and carry from 10 to 12 tons of fruit, and use 15 tons of ice in crossing the continent from Sacramento to New York. The freight on the car load for this distance is 360 dols., or £75, and, in addition, 190 dols., or £39 11s. 9d., has to be paid for refrigeration. From Sacramento to Chicago the freight on a car of fruit is 300 dols., and refrigerator charges 125 dols. This will show that fair prices have to be realized in the eastern states to give the Californian grower any margin of profit. By adopting the Perkins process it was claimed that the car used would be at least 7 tons lighter than a refrigerator one, and carry the same quantity of fruit, also that the cost of and haulage of 15 tons of ice would be dispensed with. This would allow a material reduction in freight to be made. In addition to all this, came in the better preservation of fruit, and its being retained at its terminal market (in event of not being disposed of on arrival) in chambers fitted up for the purpose, and so kept in a fresh condition. By this means more even distribution and glutted markets unavoidable where large quantities of perishable ripe fruit, which must be sold on arriving, would be obviated.

I will here give a copy of the report of Professors Hilgard and Smith, who were appointed a sub-committee by the State Horticultural Board to report on the Perkins process :—

Report of Professors Hilgard and Smith, acting as a sub-committee.

"The process embraces two main points, to wit :—

"First—The longer preservation of the fruit by the effect of a slow current of air having a minimum temperature of 55° to a maximum of 65° Fahr. passing continuously over it.

"Second—The maintenance of this temperature at all times in the hot desert as well as in cold winters by approximate means not involving the use of ice, the refrigeration being accomplished by the expansion of compressed air.

"The committee have not had the opportunity of witnessing the process in operation, and as regards the results must rely on the statements of Dr. Perkins (the correctness of which we have no reason to doubt) and the testimony of one of their number, Professor Smith. The efficacy of a current of reasonably dry air in promoting the conservation of fruit, so as to insure its arrival

in good condition, even after a considerably longer transit than now commonly occurs, seems thus to be placed beyond doubt. Fruit thus conserved has the additional advantage that, upon arrival at destination, it will not under the influence of moist air become covered with condensed moisture, as inevitably happens when it has during transportation been maintained at a low temperature by refrigeration with ice. That such bedewing of the fruit is highly injurious to its keeping qualities is well known. The Perkins process apparently obviates this difficulty, and leaves the fruit to arrive and remain perfectly dry. It is but reasonable to suppose that its life will be materially lengthened while in the hands of the dealer and consumer—an advantage which it is difficult to over-estimate, especially if as it is claimed fruit to be thus treated may be more fully matured at the time of shipment.

"As regards the second point, viz., the maintenance of the air current at the uniform temperature of say 55° to 60° without the aid of the ice, even in the hot desert air, there is no question but what it can be accomplished by the means claimed, viz., the compression of air by means of a pump. Then, after giving it time to cool down to the outside temperature—say 120° at most—allowing it to expand under proper conditions, reducing its temperature, and therefore that of the air current, to 55° or less. The preposition is theoretically sound, and it seems possible to make it practically feasible, with perhaps only a slight addition to the weight of an ordinary car, in the way of reservoirs and minor appliances, the exact arrangement size and form of which must be determined by experience. As regards maintenance of the same temperature in winter, there is no difficulty about making the same appliances answer the purpose of heating by the addition of a steam coil or otherwise.

"We are therefore of the opinion that this invention deserves the most earnest consideration on the part of the fruit-growers, transportation companies, and all interested in the fruit industry, since it appears to offer a simple (and as compared with the refrigerating process) inexpensive solution of the problem, both of cheaper transportation and of better conservation of fresh fruit for the eastern and perhaps the European markets.

"E. W. Hilgard,
"University of California.
"Emory E. Smith,
"Stanford University."

Subsequently, at the annual meeting of the State Fruit-growers' Convention, Professor Hilgard spoke in most commendatory terms of the Perkins process. He stated that any one present at the opening of a refrigerator car in the east, when it arrived from California, would see, when the weather was at all damp, that the fruit became covered with a dew of water in the course of a few

hours, and after the moisture appears it soon causes a spot of brown to appear on the grape. This would be obviated by carrying the fruit at a temperature so nearly the one in which it is to be marketed that it would remain dry. In his speech he also referred to the important fact that fruit, on arriving at its destination, if prices were unsuitable, could he held over to wait on the market.

At the time of my visit the fruit harvest was in full swing, and large quantities were being sent to the eastern States. Trains wholly laden with this product were being despatched daily from the fruit districts of California. The great commercial depression in eastern cities had, however, restricted the consumption of fruit if sold over certain values, so that a fall in prices took place. The result of this was that many growers in California, on receiving their account sales, found that when freight and refrigerator charges were deducted they had either made no margin of profit on the transaction or were debited with a loss. The consequence was a strong feeling was being expressed everywhere that unless something could be done in the way of reducing transit charges, fruit-growing in California would receive a great check, and probably retrograde. The refrigeration and railway companies both began to see this, because just previous to my last interview with Dr. Perkins, in September, he had been interviewed by a representative of one of the former to ascertain whether he would sell them the whole and sole right to the process which the doctor had secured by patent rights. This he refused to do. A company was also in projection, when I felt California, to get trucks built and storage warehouses erected to be worked on the Perkins principle. The Southern Pacific Railway Company also deputed one of its best engineers to examine the process and all apparatus required in working it. I left California for Utah before the results of this examination were made known. Before going away, however—recognising the great advantages possessed by the process for Victorian fruit-growers, if it proved to be so successful as all experiments and evidence seemed to warrant it would—I asked Dr. Perkins specially about its adaptation for the chambers of ocean steamers. He stated that it could be applied more readily to fruit shipment in the chambers of a steamer than to railway cars, there being less difficulties to contend with in this direction. I further asked him what he would require for the use of his system by us. His reply was of the most fair and reasonable character. He stated that he had no desire to make his discovery (which is, as stated, covered by patent rights) the means of exacting a large sum of money for its use and adoption, and he was determined that it should not pass from his hands so as to become the cause of monopoly and exaction.

If required to do so, he would come to Victoria, and personally superintend the fitting of either cars or a vessel's chamber for the use of his process, provided the Government of the colony

paid the expense of his trip and stay there. If the result was successful, he would only require a fair and reasonable royalty on each 100 tons of fruit shipped.

After I left California quite a rapid development took place. The engineer appointed by the Southern Pacific Railway Company reported in the most favorable terms on the Perkins process, and so approved of it that the railway company took a large number of shares in the California Transit and Storage Company, as the new company to utilize and work it was termed. The Southern Pacific Company also gave Dr. Perkins permission to have a fruit car suitable for adaptation to his process, for trial purposes built in their workshops, under his own personal superintendence. This was done, and in November last, a Perkins car load of grapes and peaches were sent on a trial trip to New Orleans, from Oakland, a suburb of San Francisco. A number of bunches of flowers were also cut and put in the car with the fruit. The car was ran to New Orleans and back again to Oakland, doing a journey of over 5,000 miles, and being absent fifteen days. The trial was a perfect success, the cut flowers in the car on their return being taken out perfectly fresh, and the grapes and peaches in the same condition. The following report appeared in the *San Francisco Chronicle*, of 11th November, describing the arrival of the car at New Orleans:—

"A despatch from New Orleans to a gentleman in this city announces that Dr. Alfred T. Perkins' experimental carload of fruit, grapes, berries, and cut flowers had arrived in that city in excellent condition. The fruit, grapes, and berries were as fresh as the day they were gathered, and the flowers had not lost either their fragrance or their bloom. Dr. Perkins' plan for shipping fruit promises to revolutionize the fruit-shipping industry and save thousands of dollars every year to the California growers who send their products to eastern markets. The doctor preserves fruit by means of compressed air. But few people in this state have any idea that such a method exists, but in Paris the name of Dr. Perkins is well known, and he has been honoured by the Academy of Sciences of that city sending him a gold medal in recognition of his merit as an inventor. Dr. Perkins is the pastor of an Episcopal church in Alameda. Six years ago he began on his experiments, and for at least five years his method of preserving fruit, flowers, and meat has been in practical operation at his home. The principle involved is very simple. Attached to the locomotive is an air-compressor, in which the pressure of air reaches over 80 lbs. to the square inch. Air compressed to such an extent becomes heated to such a degree that the germinal life it contains is destroyed. The sterilized air is passed into a receiver, where it is cooled and then forced into an airtight car in which the fruit is placed. The germ-laden air is in turn forced out of the car, and the fruit is carried to its destination in perfectly pure air. Mold and other matter of a fungus

nature originates in the atmosphere and settles upon fruit, where it spreads and soon sets up decomposition. Where only pure air reaches the fruit the process of decomposition is arrested for a long time. By Dr. Perkins' apparatus pure cold air is kept in constant circulation through the car, and any impurity is forced out through a small vent or valve in the roof. With but little loss of power to the engine this process is kept up during the entire journey.

"The new method of shipping fruit will, without doubt, drive the cold storage and refrigerator car system out of the field, as the new system is less expensive in many ways. In the first place, the special car that Dr. Perkins had constructed weighs only 23,000 lbs. The usual refrigerator car weighs 47,000 lbs. Thus, Dr. Perkins can place 12 tons of fruit in his car before the car and contents equal the weight of an empty refrigerator car. The horse-power required to haul seven of the old cars will easily draw ten of the new cars. It is claimed that the loss to the shippers by the old style averages 100 dols. per car, which makes the loss many thousand dollars a season. There is practically no loss sustained in the new system. Another advantage claimed is that it is not necessary now to pick half-ripe fruit, which is so hard to dispose of in the eastern markets on account of its being without flavour. The recent experiment proved that fruit, grapes, berries, and flowers gathered at their best reached New Orleans in perfect condition. This will increase the prices and demand for California products.

"That there should be considerable jealousy felt by those who have been carrying fruit in the past is not to be wondered at. When the new fruit car reached Sacramento, a week ago yesterday, some one broke it open and destroyed a part of the compressed-air apparatus. After a little delay in making repairs the car went east by the southern route in order to put the contents to a severe test in the hot climate of the south.

"A part of the fruit has been sold in New Orleans, but the bulk will be brought back to this city in order that shippers may be satisfied as to its condition after travelling in hot weather for thousands of miles. The car is expected to reach this city about the middle of the coming week. In honour of the success of the compressed-air system of shipping fruit a reception and good time will be held at the State Board of Trade rooms on Market-street, near Second, as soon as the car arrives."

On the return of the car to Oakland, it was inspected by the president and members of the San Francisco Board of Trade. The *Morning Call*, a leading San Francisco daily, under date of 20th November, thus describes the inspection :—

"After a journey of over 5,000 miles, requiring fifteen days, the experimental car, loaded with fruits and flowers, which started from Oakland over two weeks ago, returned from its trip to New Orleans. This car was loaded with the purpose in view of testing

thoroughly the efficacy of sterilized atmosphere as a substitute for ice for use in refrigerator cars, and the results secured were in every way of the most satisfactory nature.

"There was a representative crowd of gentlemen present when the car was opened yesterday morning, including the president and other officials of the State Board of Trade, several gentlemen who are interested in the carbonic acid plan recently tested in the same manner as the one now spoken of, and a number of the head officials of the Southern Pacific Company. Dr. Perkins, who was the inventor of the process under consideration, was also present.

"He superintended the fitting up of the car and its loading, and went with it all the way to New Orleans, in order to see that everything was all right, and to observe closely the effects of the process upon the contents of the car.

"Dr. Perkins said that the car had been opened about 30 times during the trip, and for this reason the condition of its contents now was manifestly not a fair test as to the merits of the plan, but it proved upon examination that no explanation of this character was necessary, as both the fruit and flowers were found to be in a most excellent condition.

"There was hardly an article in the car which showed the slightest indication of decay. Boxes of grapes were taken out which were as firm as the day they were packed, and which proved to have retained all their usual flavour. Dr. Perkins stated that these grapes were picked in the early morning while the dew was still fresh upon them, and this statement brought out the remark from one of the gentlemen present that they should have been first dried in the sun before packing, as much injury was likely to result from the moisture spoken of after being packed for a day or two. No trace of bad effects in this particular were noticeable. This was also true of all the fruits in the car, and, as for the flowers, they still retained their fragrance and fresh appearance. Splendid chrysanthemums were brought to the light without a drooping leaf, looking, as the onlookers said, as if they had just been plucked from the garden.

"The most interesting phase of this experiment rests in the probable cost of shipments, and, if what is claimed for the process proves true, the fruit-growers and florists of this state will have great cause for self-congratulation. It is said that the maximum cost of the shipment by the process will be 25 dollars a car, and it is thought that 20 dollars will in most cases be amply sufficient to pay the cost in this respect. Shipment in the old manner by refrigerator cars costs approximately 200 dollars each, thus making a saving of at least 175 dollars a car.

"Frequently in packing a car with ice as much as two tons are wasted without securing any result, that is, it requires that amount to get the car down to the necessary temperature before the fruit can be put in. Another saving of magnitude by the

new process will be that of space, as no ice will be required, thus giving a car a capacity fully one-quarter greater than it possesses under the present methods. This, of course, will necessitate the construction of new cars especially fitted up for the purpose designated.

"Competent authorities state that there are each year on an average 20,000 cars of fruit shipped out of California, and estimating the saving on each car at 150 dollars, the neat sum of 3,000,000 dollars is saved to the grower.

"A feature of the sterilized atmosphere process which will have quite a bearing upon its success, is that under the method, fruits, it is claimed, will ripen while in transit, the effect of the air being at the same time to prevent, or rather in great measure retard, the work of decay.

"The greatest interest was manifested in the experiments, as Dr. Perkins reports, not only by the commission men of New Orleans, but by all the fruit-growers who inspected the cars. During the short stay in that city dozens of them looked over the contents of the cars, and all along the line where stops were made inquiries were frequent as to the condition of the shipment. It is probable that another shipment will be made soon to Chicago, after some necessary changes suggested by the first trip have been made."

In addition to these papers, all noticed gave similar reports. I have received a number, referring to the success of the trial made, but the two extracts given are sufficient.

Since returning to Victoria I have received a letter from Dr. Perkins, which states in reference to the foregoing—"All arrived back in perfect condition, and the flowers were as fresh as when put in the car. The atmospheric temperature during the trip had a swing from 64° to 104° Fah., and the car variation was but 5° Fah. The grapes we brought back as a test were placed in the open air, and the process had given them such life that they were in good condition six weeks after, and the few that were left dried away without decay.

"I am now experimenting in the interest of our meat carriers, who desire a lower temperature than required for fruit transportation. I can confidently say I have it. This will increase the efficiency of the service, as the chambers on ship can be easily arranged to take the air at varying temperatures from the same plant."

He also mentioned that they were busy at the time of writing at the railroad workshops at Sacramento, building and developing cars for the new service. Mr. A. T. Hatch, the large fruit-grower previously referred to, has purchased a heavy interest in the company, and is its president.

Now, the importance of this discovery of Dr. Perkins to Victorian fruit-growers can hardly be estimated. Our fruit season is the opposite to that of the whole of Europe or the United States,

and if we can ship grapes, peaches, apricots, strawberries, and other fruits successfully to arrive in good condition on the London or continental city markets during a period when they are almost unobtainable from elsewhere, it would simply mean the opening of a new era of wealth to the colony.

If this is possible, and under the process just referred to there seems little doubt of it, our butter industry, great as it is, would soon have a greater rival in contributing to the wealth and prosperity of the colony. We have a very large area of land under orchards and vineyards, and magnificent fruit can be produced over the greater portion of Victoria. Each district from the sea to the Murray River is suitable for the especial production of some class of fruit. In addition to fruit, the utility of the process, according to the experiments made by Dr. Perkins, can be extended to the preservation of vegetables, where our opposite season to that of the northern one might possibly be of advantage also.

For internal car service in the colony, where perishable products have to be carried during the hot summer months, the Perkins car and service, if superior to the refrigerator ones in use in America, would prove equally so here where artificial ice has to be used.

On arriving in London, on my way home from South America, in the latter end of March, grapes were selling at from 1s. 6d. to 4s. 6d. per lb., the latter price for the best hot-house ones. Our early grape crop is ready in January and February, and if they could be shipped would arrive there in March. There is a certainty, if good table grapes were landed then in first-class condition, that they would give our growers a handsome profit.

I have written fully on this matter, because from what I saw personally, and from the evidence and proof given, I am perfectly satisfied that Dr. Perkins' system of fruit preservation is a success, and appears to be equally well applicable to ocean as to railroad service I therefore desire to place all information obtained about it before the fruit-growers of the colony, commending it to their earnest consideration.

By Authority: Robt. S. Brain, Government Printer, Melbourne.