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THE INSPECTION AND GRADING OF GRAIN.

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A THESIS SUBMITTED TO THE FACULTY OF THE GRADUATE SCHOOL  
OF THE UNIVERSITY OF MINNESOTA

BY

Hugh Bruce Price

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## INTRODUCTION.

The growth of grain markets, due to the development of grain-growing regions and an increase in the industrial population, has created many interesting problems related to the social and economic aspects of commercial distribution. The relation of the producer to the middleman and to the consumer has become correspondingly complex, and the maladjustments accompanying these industrial changes have been the subject of private and public discussion; they have also commanded new methods of grain marketing. One of the new features of this development is the promulgation of standards of quality and the division of the commercial grains into established grades. Private and public organizations have been created to apply these standards and are known as "inspection departments". This thesis is devoted to an analysis of this aspect of the marketing process of grain.

The reader will appreciate the scarcity of written material and scientific treatment of this subject. The annual reports of the inspection departments are incomplete, particularly the reports of the private inspection departments. I have, therefore, been obliged to rely largely upon information secured from those engaged in the grain trade and such additional data as I could secure from the inspection departments upon which to base the body of this treatise. I am indebted to the members of the Minneapolis Chamber of Commerce and the Duluth Board of Trade for much valuable information; I am also indebted to H.E. Emerson, Chief Grain Inspector of Minnesota, and G.H. Tunell, Chief Deputy



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## CHAPTER I.

## HISTORICAL DEVELOPMENT.

The development of markets has witnessed an ever increasing tendency toward the standardization of the products in those markets. This is true of both raw and finished products. By having them divided into certain well known grades with given descriptions, the buyer feels more certain of the quality of the goods bought and the seller receives better values for his commodities, because they have a recognized value which buyers are willing to buy. In short, standardization of a commodity into grades of a given description minimizes the risk which a buyer incurs when purchasing any part of it, and consequently cheapens the goods to the consumer or raises the price to the producer.

There are certain characteristics in the different commodities, however, which make some much more easily standardized into grades than others. First, there must be a fair degree of homogeneity if an efficient grading system is to be secured; that is, the commodity must be such that it can be divided into lots or packages of uniform quality; second, it should be non-perishable so that when it is labeled or given a grade, its quality will not quickly deteriorate; third, it must be easily divided into lots or packages. A survey of commodities that have standard grades, such as clothing, machinery, building material, grain, cotton, and many others that might be mentioned, have these characteristics; whereas such products as vegetables lack one or all of them.

The development of grading farm produce has proceeded

more slowly than for other commodities primarily because it lacks one or all of these characteristics essential <sup>to</sup> standardization. Live-stock, for example, is comparatively non-perishable, but no two animals have exactly the same characteristics making it impossible to secure clearly defined commercial grades. Vegetables, such as potatoes, are both perishable and non-uniform in quality. Much fruit does not lend itself to grading because of its perishability, although considerable progress has been made in recent years, notably by the California Fruit Growers Association, to standardize some of the less perishable fruits into recognized commercial grades.

Cotton and grain, on the other hand, are much more easily graded than other farm produce. This is made possible first, by their uniform quality, second, because they are not perishable, and third, because they can be divided into small quantities. Consequently, more progress has been made in developing inspection systems for these commodities. This, however, is not due entirely to their superior qualities, which only make grading possible, but is partly explained by the greater necessity of grading commodities sold in a world market than of grading those sold in a local market.

In the early stages of the grain industry there was no need for an elaborate system of grades and inspection; the farm cereals were consumed locally. The first step away from milling the wheat and malting the barley on the farm where it was produced, was the country flour mill and brewery. Here the farmer brought his grain and either received in return the finished product, paying a toll, or bargained with the miller and brewer for the disposition

of his grain. the market value was determined directly by the relative bargaining ability of the producer and consumer. The only possibility of deception was in the manipulation of weights, but even then the producer felt that, in so far as he had personally supervised the sale of his grain, the transaction was consummated satisfactorily. There was no need to add to the marketing cost by hiring someone to grade the grain.

This was the marketing situation in the United States until the middle of the nineteenth century when, because of economic forces that were then operating, the marketing of grain was radically changed. New and better methods of cultivation were introduced; the Homestead Act of 1862 encouraged the settlement of the fertile grain-growing lands of the Mississippi Valley; both factors increased the grain production of the country enormously so that the old methods of marketing were inadequate. There was a corresponding expansion of the transportation systems and the development of large markets at such places as Chicago, Philadelphia, and Minneapolis. With increased production came new processes in milling which gave impetus to the development of the flour-milling industry at Minneapolis, Buffalo, and other places of minor importance. All these forces working together produced a highly developed marketing system that demanded new methods of procedure and control.

This development added a new and very important aspect to grain marketing. The producer could no longer sell his grain and retain that personal supervision which was formerly possible. The grain either had to be shipped direct to the consumer or to a representative of the shipper who disposed of it in the interest of the shipper in some distant market. In either case the shipper

felt that he was at a disadvantage because he could no longer supervise the sale of his grain. Cases of dispute often arose because the shipper having valued the grain high, for a full- or over-valuation, felt that he had been defrauded even though no irregularity had taken place in the transaction. On the other hand, the buyers found themselves continually confronted with the dissatisfaction of shippers; business was delayed by constant disputes and traffic became congested thereby.

Marketing methods were, at best, very unsatisfactory for the buyers, especially the millers. Grain was bought on sample, a method that has considerable merit when the grain is actually in the market, but which is slow and cumbersome under other conditions. A flour mill wishing to buy wheat in another market would, in the absence of a reliable inspection, have to go to the inconvenience and expense of first procuring a sample of the grain before purchasing in order to be sure that the grain was of the quality desired. It might rely upon the reputation of the seller, but that too often involves considerable risk. Then too, a mill often wishes to contract for grain for future delivery in order to fill its flour contracts; a certain quality of wheat is required to produce the quality of flour contracted for, so that it is very essential for the mill to get the correct kind of wheat. When the grain is delivered the miller wants to know that he secures the quality specified in the contract, and he is not sure of this unless there are definite grain descriptions and some impartial agent to apply them to the grain delivered.

Thus, out of the expanding markets, the separation of the buyer and seller, and the development of future trading, has grown

a demand for a third, disinterested party to pass upon the quality of the grain in order to maintain harmony between the buying and selling interests and to facilitate the crop movements. Grain inspection then involves both technical features of promulgating grades and important economic aspects in their administration. Grain lends itself to grade standardization; an efficient inspection system eliminates friction and obviates delay; it lessens the risk of present or future contract, thus lowering the cost of marketing and materially aiding both producer and consumer.

No other country had yet solved the problems presented to us by our developing grain markets. In fact, no <sup>other</sup> country had been confronted with such a complex marketing situation. The expansion of our cereal-bearing lands and the development of markets were unprecedented and presented problems hitherto unknown. Necessarily, America became the pioneer in the inspection and grading of grain; it had not only to work out the fundamental principles of inspection and grade standardization, but also to adapt them to its complex marketing methods.

The eastward movement of grain to the large centers of consumption stimulated the growth of markets at points of strategic transportation importance. Because of its location at the head of Lake Michigan and its central location, Chicago became the most important primary market in the early development of the West, and consequently organized the first inspection department in 1869. Other markets soon followed Chicago's example and it was only a few years until every primary market of importance had organized an inspection department.

Although the methods of organization have varied with the



different markets, yet each inspection department has gone through about the same stages of development. Most of the early bureaus were organized as a part of the trade organization of each market; this function naturally fell to the exchanges and boards of trade inasmuch as their organizations exist to regulate and facilitate marketing and since inspection is one of the necessary steps in the marketing process. The Minneapolis market offers a typical illustration. There, the first chief inspector was appointed by the Millers Association which was the chief trade organization in the early history of Minneapolis. When the Chamber of Commerce organized in 1881 it provided for an inspection department that superseded the Millers' inspection, but in 1885 it surrendered the function to the State of Minnesota which has since supervised the inspection in Minnesota markets.

Exchange inspection is a logical step in the evolution of a better inspection system, but there are certain inherent weaknesses which make it but temporary. In the first place, it does not provide a wholly disinterested party to grade grain. The exchange organization appoints the inspectors, adopts the grade, and supervises the methods of inspection. This means that the dominant grain interest in the market controls the grade standards; if the buyers are predominant, the standard of inspection is likely to be high, if the selling interests are in control the standard will be low. To what extent exchange inspection has been influenced by these factors is difficult to say. In the early development of the markets it may have been a very important consideration, but at the present time with the buying and selling interests so evenly divided in all markets, the possibility of local influence is



more remote. This has an important bearing upon the attitude of the producer toward exchange inspection. So long as the inspection department is maintained by an organization of which the buying interests are an important part, the producer and country shipper is suspicious of inspection methods, because there exists the possibility that the inspector may be influenced to grade the grain in favor of the buyer; this possibility of favoritism will be magnified as long as the country shipper is obliged to accept the inspection of the organization through which and to which he sells his grain. The producers have a watchful interest in the practices of the boards of trade, and should object to any practices that discriminate against them, so that any possibility of local influence, although it has never resulted in discrimination, always creates an unjust amount of friction and dissatisfaction.

Another weakness of exchange inspection is its lack of uniformity between markets. No board of trade can make its inspection acceptable in other markets because its jurisdiction does not extend beyond its own operations. There is no way to keep the inspection departments in touch with each other and to grade by the same standards. Therefore, there are as many standards of inspection in a country as there are exchange inspection departments, a situation that is disadvantageous to the grain trade in that it leads to a great deal of uncertainty and possible friction among the different markets. These two defects aroused considerable agitation for inspection under some higher authority.

The next logical step was state inspection. If inspection supervised by the trade was unsatisfactory, some form of governmental administration was necessary. This function might have fallen to

to the federal government but, owing to the prevalent political idea that the states should control all matters of local importance, the supervision of inspection naturally fell to the jurisdiction of the states. Inspection was thus farther removed from local influence; it was placed in the hands of an administration controlled both by producers and consumers.

The first state to provide for its own inspection was Illinois, which, in 1871, passed a law providing for state inspection in cities of one hundred thousand and over. This was intended to apply to Chicago. Missouri soon followed with a law that allowed only state inspection within its borders. In 1885<sup>(1)</sup>, Minnesota turned this function over to its Railroad and Warehouse Commission, only to be followed shortly by its neighboring state to the East, Wisconsin. Wisconsin inspection, however, applies only to Superior and exempts Milwaukee, one of its two important markets. The agitation of the producers in Kansas terminated in state inspection in 1897<sup>(2)</sup>, and was followed by Oklahoma in 1899<sup>(3)</sup>. The past four years have witnessed increased activity in this direction, and have added to the list of states, Washington in 1911<sup>(4)</sup>, and Montana in 1913<sup>(5)</sup>, making eight states that provide for grain inspection.

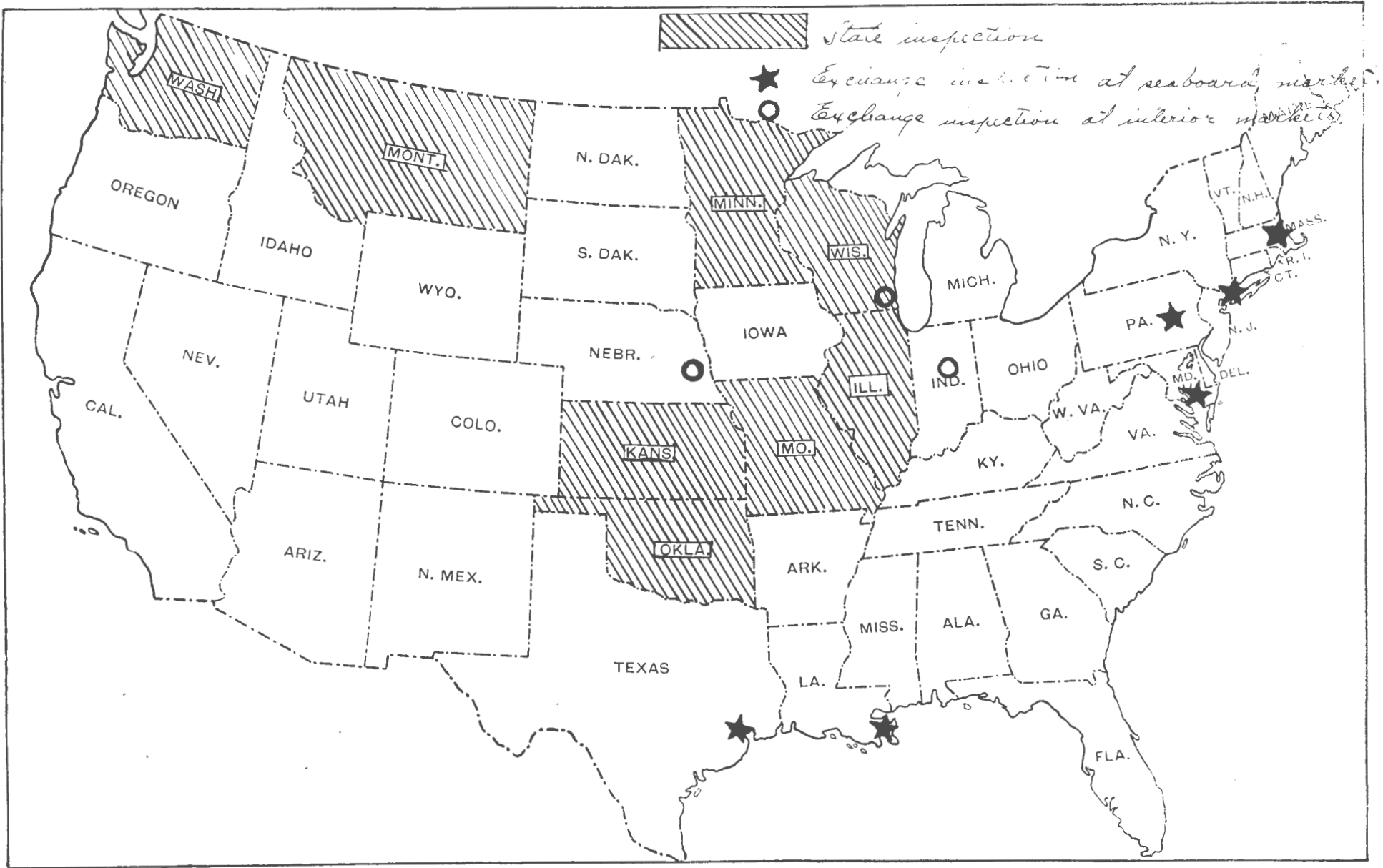
The map on the following page shows the extent of state

- (1) Annual Report of the Chief Inspector of Grain to the Minnesota Railroad and Warehouse Commission, 1906, p.9.
- (2) Session Laws of Kansas 1897, Chapter 222.
- (3) Revised Laws of Oklahoma for 1910, Chap.20, Article 1.
- (4) Session Laws of Kansas for 1911, Chap.91.
- (5) Session Laws of Montana for 1913, Chap.47.

and exchange inspection and illustrates the relative importance of the two types of inspection organizations at the present time. It should be noted that the principal primary markets, Chicago, Minneapolis, Duluth, Kansas City, and St. Louis, to which the heavy grain-producing sections are tributary, have state inspection. They are located in important grain producing states where the producers have strong political influence which accounts for their type of inspection. On the other hand, a number of the small interior markets and the seaboard points where the exporting element is dominant have exchange inspection.

These two types of inspection have not added to the complexity of the situation; their chief difference is in administrative organization. Where state inspection has been provided, with a few exceptions, the exchange inspection departments were absorbed by the higher authority without any friction. In fact, state inspection has tended to simplify and eliminate some of the weaknesses of exchange inspection in so far as it has tended to unify the grading of the different markets.

Uniformity of inspection standards is one of the essential needs of the grain trade. The merchant shipping No. 2 Red wheat from Kansas City wants to know that that carload will grade No. 2 Red Winter in Chicago. The producer wants to know that No. 1 Northern wheat represents the same kind of wheat in Minneapolis as in Chicago in order that he may be able to choose the better market. Obviously, the present market methods can not meet that demand. It is true that state inspection has a tendency toward uniformity but it has serious limitations. At best, state inspection can effect uniformity only within the state and no state has more than



two markets of any importance. With eight state inspection departments and no higher authority to unify them, different standards of inspection must necessarily exist between the different markets.

These inherent weaknesses of state and exchange inspection have caused considerable agitation for federal standardization of grain grades, and federal inspection. As early as 1890<sup>(1)</sup> the need for standardization of grain grades was brought to the attention of Congress but no action was secured. In 1903<sup>(2)</sup>, Senator McCumber of North Dakota introduced a bill providing for standardization of grades and federal inspection, but it was not until 1906 that action was secured authorizing the Department of Agriculture to secure data looking forward to promulgating federal grain grades. After years of careful study federal corn grades were established July 1, 1914.

The McCumber federal inspection bill was introduced at succeeding sessions of Congress, but it was not until 1914 that definite action was secured. The measure met much opposition from the grain trade which considered it too radical a departure from present methods, consequently causing its defeat. This bill provided a federal inspection bureau separate from present state or exchange inspection departments, and thus would have created a dual inspection system. As a compromise measure, the Lever bill<sup>(3)</sup> was introduced in 1914, providing for federal supervision of present inspection. This bill never came to a vote, but was re-introduced in 1915<sup>(4)</sup> as the Moss bill, which passed the House of

(1) Annals of Am. Acad. 38:386-7, C.J.F. Merrill, Classification of Grain into Grades.

(2) Ibid.

(3) H.R. 14493, Mar. 11, 1914.

(4) H.R. 17971, Jan. 6, 1915.

Representatives by a safe majority but failed to be put to a vote in the Senate where, according to friends of the measure, it would have passed if action could have been secured. The bill, now known as the Ruby bill, is before Congress but owing to pressure of more important measures has received no consideration.

The Lever, Moss, and Ruby bills, providing for federal standardization of grain grades and federal supervision of inspection, have the support of the Department of Agriculture, the producers, the millers and a considerable part of other trade interests, so that judging from the consideration given the Moss bill at the preceding Congress, there is reasonable assurance that the Ruby bill will receive favorable consideration when brought to a vote. The Department of Agriculture has also collected data on wheat, oats, and barley that will aid in standardizing grades for those grains in the near future. However, if the Ruby bill should be defeated in this Congress, it is safe to say that it is only a question of a few years until we shall have some form of federal inspection.

Thus grain inspection has had a perfectly logical development; it has proceeded from local to state, from state to national importance. As its sphere of importance has enlarged it has been necessary to widen its administrative control until now federal supervision appears essential to remove this important feature of marketing from the possible dominance of powerful trade interests and to secure uniformity between the markets, thus facilitating the free exchange of commodities with a minimum of friction.



## CHAPTER II.

## GRADING AT COUNTRY POINTS.

Grading of grain at country elevators and warehouses is very poorly developed; it is a fair representation of grain inspection at the terminal markets during the early days of grain marketing, but it indicates a marked improvement over the methods of grading at the country points at a time when grain was first produced for, and sent to, distant markets. The terminal standards of inspection were crude and fluctuating so that the uneducated country buyer had little assistance from the markets to which he was shipping. Elevator facilities were usually poor; grain was frequently unloaded by hand from the farmer's wagon directly into the car, or it was scooped into a small, one-story building with a capacity of probably three or four carloads, adequate elevator facilities were very rare, which served as temporary storing facilities for the local grain trade. With such equipment and knowledge, the classification of grain into well-defined grades was impossible. The warehouse operator was obliged to load his grain into cars as fast as it came to market, because he had no bin room to store grain, and hence could not separate the grain of different quality. Being unable to preserve the identity of the grain of different quality as it came to market, there could be little difference in the price since it would all be mixed together for shipment, and would give the operator no basis for determining the price for different qualities. The producer who marketed choice grain, therefore, received no premium to which he was entitled.

Conditions have materially changed at these country points, especially in recent years. Large, well-equipped elevators have replaced the little flat house at the railroad sidetrack. Several bins are devoted to each important grain, so there is the possibility of at least a rough classification into grades; improved systems of inspection at terminal markets give a better basis for country buying; improved means of communication have brought the operator into closer contact with terminal inspection; last, and very important, more efficient operators are employed. These conditions have resulted in more efficient methods of marketing at country points, and while they are still far from ideal, they are a wonderful improvement over former methods,

As the grain industry developed the business of the country elevators increased until it is now a common occurrence for one to handle a quarter of a million bushels per year. Many of them have assumed the proportions of a large sized business, and because of their public nature demand state supervision in order to guard against unfair methods of competition, weighing, grading, and dockage that would be injurious to the producer.

The North Dakota Grain Commission in its report to Governor Burke in 1908<sup>(1)</sup> recommended that local elevators in North Dakota should be obliged to use terminal (Minnesota) grades since North Dakota sold most of its grain at Minneapolis and Duluth, and were obliged to accept Minnesota grades. It further recommended<sup>(2)</sup> that country elevators should be required to make

(1) Report of the Board of Grain Commissioners to Governor of North Dakota, 1908, p.21.

(2) Report of the Board of Grain Commissioners to Governor of North Dakota, 1908, p.23.



annual reports and in them should show the amount of grain received, how graded, the dockage and disposition of the same, also the terminal weight, grade and dockage. Many of the North Dakota elevators were using Minnesota grades, but by requiring all to follow them, the possibility of deception in grading, weighing, and docking is minimized.

The Minnesota Railroad and Warehouse Commission exercises supervision over the country elevators of Minnesota. A supervisor devotes his time to licensing these elevators and looking after their methods of competition, grading, etc. They are required to use Minnesota grades; they are also required to submit annual reports of their marketing methods to the commission. These include the number of bushels and dockage of each grade bought and the amount of each grade and dockage sold at terminal markets, the amount of grain cleaned, number of bins for each grain, and weighing. The reports on grades and dockage are very incomplete and unsatisfactory, owing to poor accounting systems, but they show the general methods employed and tendencies of country inspection. They make the country elevators analyze their methods which, if for no other reason, warrants the commission to require at least an occasional report of this nature.

The legislature of South Dakota, in 1913, enacted a law to regulate grading at all grain elevators in the state. It provides for grain grades that shall not differ from the Minnesota grades, and that these grades shall be used by all public warehouses. An interesting feature of the law regarding dockage follows:-<sup>(1)</sup>

"In the purchase, sale or delivery of any grain, seed or any other

(1) Session Laws of South Dakota, 1913.

mixture, such dockage must be according to the per cent such dirt or mixture bears to the contents to be docked, which must be determined by careful sifting and grading and no greater dockage shall be taken than the proportion such mixture bears to the contents to be docked".

The country elevators follow as nearly as possible, the grades of the market to which they ship. After a few cars have been marketed at the beginning of the new crop movement, the country operators secure an idea of the terminal standard of grading for the crop. Many of these buyers are expert judges of grain from long years of experience, and can easily determine an inspection standard, but because of local conditions, can not follow it closely.

Of all the grains, wheat is graded most nearly to terminal methods. This is because it is of greatest commercial importance, most widely bought and sold, and because it lends itself to standardization most easily. Nearly every elevator is equipped with a test kettle to determine the weight of the grain which is an important factor in wheat inspection. When the wheat crop is of particularly light weight, the test kettle is used on much of the grain since weight is then of particular significance at the terminal market, the terminal elevators being anxious to secure wheat of sufficient weight for the contract grades; but when wheat is uniformly heavy and there is no question of its eligibility for the best grades so far as its weight is concerned, little attention is paid to weighing each load as it comes to market. If an occasional load is light, it can be mixed with the other grain without materially lowering the average weight of the total mixture. Under such conditions, color and per cent of damage are the chief

factors considered.

Less attention is given to classifying oats and barley than to wheat. These grains are of less commercial importance and more difficult to grade; hence, a fewer number of bins are provided to handle them and the grades are of little importance. Barley is usually divided into two classes depending upon its quality for brewing or for feeding purposes. The classification of oats is even rougher, all that is bought being frequently put together in one bin. Where some attempt is made to classify them, about two grades are used, No.2 and No.3, or No.3 and No.4, depending upon the crop. These grains are bought primarily by prices, the buyers compete chiefly by paying what they think the grain is worth and not because it has been given a grade. However, the annual reports show that the grades have some importance and that where they are used the grain is over-graded.

Corn inspection is also very imperfect. Here also the country elevators frequently store all their receipts in one bin, although those who buy large quantities usually classify it, not according to grade, but on the basis of color, white, yellow, or mixed. The methods of corn grading appear to be improving. The United States Department of Agriculture maintains that the quality and uniformity of corn received from country elevators has materially raised since the promulgation of federal corn grades July 1, 1914. It must be remembered that the corn crop for that year had splendid quality and uniformity. However, we should expect the country grades to become better providing they are using the federal grades, since they are more scientific than former grades. The country elevators of the Northwest are making no

particular effort to use these grades, but in the corn belt many of them are purchasing the necessary equipment, and according to members of the Omaha Grain Exchange, they are securing a fair degree of success with the federal grades. The apparatus for using these grades consists of a Brown-Duvel moisture-testing machine and some graders, which cost about \$75.00.

So long as corn, oats, and barley hold an inferior commercial position, the methods of grading them will not be so highly perfected as the methods of inspecting wheat. Doubtless all of them will be improved upon as the terminal standards become more scientific, as the country handling facilities are improved, and as more intelligent operators are employed. One of the obstacles to the success of federal grades at country points has been the buyers' ignorance of operating the moisture-testing apparatus, but as the operators become more experienced, and as machines better adapted to country conditions are secured, there will be more effective use made of government and exchange grades. By a long, slow process of evolution and education, inspection at country points will become more scientific and significant.

The position of the country elevator in the grain marketing system makes it particularly susceptible to the producers' influence; it is the step in the marketing process nearest to the farmer, and it is nearer to him than to any other trade influence. How does this effect grading at the country points? Each farmer wishes to secure the highest possible grade on his grain, not only to secure the highest price, but to maintain his standing in the community as a producer of good grain. Hence he brings pressure to bear to secure the best grades possible, or, to state it another

way, to make the standard of grading low. The result is that competition among country elevators will induce them to grade the grain as high as the terminal to which they are shipping or as high as is necessary to get the grain.

Table I. A COMPARISON OF INSPECTION OF WHEAT AT COUNTRY ELEVATORS AND TERMINAL MARKETS, (1)  
(Crop year ending July 31, 1914)

A. Co-operative Elevators.

Grade.	Receipts. (bu.)	Shipments. (bu.)	Receipts over shipments.	Shipments over receipts.
No. 1 Nor.	2,398,730	1,880,614	21.6%	
No. 2 Nor.	521,442	956,304		64.2%
No. 3 Nor.	60,032	179,245		198.5%
No. 4 Nor.	5,442	28,005		414.2%
No grade	60,317	78,819		30.6%

B. "Line" and Independent Elevators.

Grade	Receipts. (bu.)	Shipments. (bu.)	Receipts over shipments.	Shipments over receipts.
No. 1 Nor.	1,740,815	1,290,532	31.6%	
No. 2 Nor.	430,725	685,535		59.1%
No. 3 Nor.	74,618	208,877		180.0%
No. 4 Nor.	2,519	42,904		160.3%
No grade	5,372	27,962		422.0%

(1). The data were secured from the annual reports of country elevators to the Minnesota Railroad and Warehouse Commission for the crop year 1913-14.

In the above table the "receipts" represent the amount of grain purchased for each of the grades indicated, and the "shipments" show <sup>how</sup> the same grain was graded at the terminal markets. The data are taken from the reports of forty representative co-operative elevators and from sixty-one "line" and independent elevators in Minnesota, thus giving a fair comparison of the grading of the different types of elevators and the difference in the grades at country and terminal markets.

It should be noted that the country points are over-grading; i. e., only a part of the grain that receives a given grade at the country elevator will receive that same grade when inspected by the state inspection department, a part will receive a lower grade. For example, the co-operative elevators purchased 2,398,730 bushels of No.1 Northern and sold only 1,880,614 bushels, thus losing grade on 518,116 bushels or 21.6 per cent of the grain bought as No.1 Northern. This 518,116 bushels was thrown into the lower grades, just what its distribution among the lower grades is, is impossible to determine, but very likely most of it went into No.2 Northern or No. Grade, thus causing the shipments of the lower grades to exceed the receipts.

The data suggest that over-grading is not confined to the best grade. The per cent of shipments over receipts increases from No.2 to No.4 which, upon analysis, is indicative of over-grading of these grades. If grain is over-graded as No.1 Northern, that part which is over-graded will in all probability grade No.2 Northern at the terminal. We would then expect the shipments of No.2 to equal the receipts, 521,442 bushels, plus 518,116 over-graded which equals 1,039,558 bushels. The statistics show,



however, that shipments of No. 2 are only 858,304 bushels. This means that some of the No. 2 receipts have graded No. 3 or No. 4 at the terminal market. The same analysis holds for No. 3 which indicates that over-grading exists in these grades although probably not to such an extent as for No. 1 Northern.

A comparison of the grades of co-operative elevators and "line" elevators, which include a few independently owned, shows that they have different standards. The excess of receipts over shipments for No. 1 Northern for the co-operative elevators was 21.6 per cent whereas it was 31.6 per cent for the "line" elevators. The per cent of increase of shipments over receipts from No. 3 Northern to No Grade is also greater for "line" than co-operative elevators, which indicates that the cumulative effect is greater and hence the "line" elevators are over-grading more than their competitive co-operative friends.

The data in Table II on the following page show the same tendencies as in Table I. Both types of elevators have over-graded and the "line" elevators again have a greater excess of receipts over shipments for No. 1 Northern than the co-operative elevators, and the cumulative effect on the lower grades is also greater. In 1913-14, the receipts exceeded the shipments for No. 1 Northern 21.6 per cent for the co-operative elevators, in 1914-15, 47.1 per cent. For the "line" elevators, receipts exceeded shipments for No. 1 Northern 31.1 per cent in 1913-14, and 56.3 per cent in 1914-15. This difference in the standards is due to the character of the crops. The wheat crop of 1913 was uniformly good and there was consequently less chance of losing on grades than in 1914 when drought and rust made the quality of the crop much poorer, less uniform and hence more difficult to grade.

Table II.- A COMPARISON OF INSPECTION OF WHEAT AT COUNTRY ELEVATORS AND TERMINAL ELEVATORS.

(1)  
(Crop year Aug. 1, 1914 to July 31, 1915)

A. Co-operative Elevators.

Grade.	Receipts. (bu.)	Shipments. (bu.)	Receipts over shipments.	Shipments over receipts.
No. 1 Nor.	329,630	174,210	47.1%	
No. 2 Nor.	865,812	916,600		5.8%
No. 3 Nor.	448,112	500,792		11.7%
No. 4 Nor.	119,636	168,796		41.0%
No grade	18,336	32,711		78.0%

B. "Line" and Independent Elevators.

Grade	Receipts. (bu.)	Shipments (bu.)	Receipts over shipments.	Shipments over receipts.
No. 1 Nor.	459,733	200,498	56.3%	
No. 2 Nor.	558,766	574,498		2.8%
No. 3 Nor.	230,720	436,086		89.0%
No. 4 Nor.	144,655	164,439		13.7%
No grade	14,646	30,536		108.5%

Table III.- A COMPARISON OF DOCKAGE AT COUNTRY ELEVATORS AND TERMINAL ELEVATORS.

Year.	Co-operative Elevators.		"Line" Elevators.	
	Local Dockage.	Terminal dockage.	Local dockage.	Terminal dockage.
1913-14	2.3%	2.6%	2.84%	2.83%
1914-15	2.7%	2.9%	3.2%	3.3%

(1) The data were secured from the annual reports of country elevators to the Minnesota Railroad and Warehouse Commission for the crop year 1914-15.

(2) The annual reports of the country elevators to the Minnesota Railroad and Warehouse Commission for the crop years 1913-14 and 1914-15.



Table III shows the amount of dockage or discount taken by the country elevators for dirt, foul seed, and other foreign material, also the amount taken by the inspection department at the terminal markets (this does not include dockage from those elevators that clean grain). It should be noted that the tendency is for the elevators to discount the farmers' grain less than they should for foreign material. In the absence of equipment to determine the per cent of foreign material and with the farmers desirous to avoid penalty for foreign material in their grain, one can understand why this condition exists. It should be noted further that the excess of terminal dockage over local elevator dockage is greater for the co-operative elevators than for the "line" elevators; in fact, the "line" elevators took a slightly larger per cent of dockage than the terminals in 1913-14.

It is to the interests of the producer to secure a small per cent of dockage because the lower the percentage of foul material the higher the percentage of wheat for which he is paid. So that to take less dockage than really exists, is in effect the same as over-grading. The co-operative elevators are then over-grading more than the "line" elevators so far as the dockage is concerned, but do not over-grade as much on the grades as do their competitors. Where these two types of elevators exist side by side there is usually keen competition and the grades of each tends to approximate the standard of the other as the above data indicate. There is competition in grades and prices.

Country elevators often sell to country flour mills which are usually located on a direct route to the terminal market. The method of grading such grain is agreed upon by the elevator and

mill, the terminal standard being the basis for the grade. The elevator operator ships grain which he believes will make the desired grade and determines the dockage to the best of his ability. If he is satisfied with the Mill's grade, upon which the price has been agreed beforehand, he orders the car forwarded to the terminal market. This involves no additional expense for the grain is shipped on a through rate. Thus, the four mill, in order to secure grain from country elevators, must grade as liberally as the terminal markets.

It is evident, from the foregoing remarks, that grain grades at country points are unscientific. Lack of elevator facilities, ignorance of terminal inspection, and, most important of all, competitive conditions have discouraged the development of well-defined standards. Each farmer believes that his grain is as good quality as his neighbor's grain and feels wronged if he does not secure as good grades. To meet this condition the elevator must be lenient with the grain in order to maintain friendly relations with the producers and to meet competition. This, as we have seen, causes the elevator to grade too high and to take less dockage than is present in the grain.

There is some question as to whether this condition can ever be entirely eliminated. However, education of the producer to the value of grains of different quality will be a partial solution; better elevator facilities has been and will continue to be an encouragement to more scientific methods; more intelligent operators and inspection systems adapted to country conditions will make more efficient grading possible; state supervision of marketing methods as conducted by South Dakota and Minnesota, will

encourage uniformity of grades. These forces will operate to raise the efficiency and standards of grading at country points. As the standards become more scientific, competition will pass from grades to prices, a most desirable result since every farmer will then be paid on the basis of the quality of his grain and the good grain will command its just premium, thus placing a reward upon good methods of production.

## CHAPTER III.

## INSPECTION PROBLEMS OF JURISDICTION.

The introduction of state inspection departments has enlarged the sphere of administration and in a few instances, it has divided what is naturally one market place into two parts, each under the jurisdiction of a separate state inspection department. This occurs where a state boundary line divides two adjoining cities. The first instance of this nature was created at Kansas City where Kansas City, Kansas, and Kansas City, Missouri, are divided by only the Kansas-Missouri state boundary line. The boards of trade at each city handle grain that moves to that market, but the bulk of it is sold on the board of trade at Kansas City, Missouri.

With the development of the winter wheat lands of the Southwest, Kansas City, because of its favorable location, became one of the important grain markets of the country. As St. Louis was also a market of considerable importance, Missouri became one of the first states of importance in grain marketing and consequently was among the first to adopt state inspection.

The agitation for state grain inspection, however, was not confined in the Southwest to the Missouri producers; it extended to all parts of that section. And when it had been adopted in Missouri, the producers of Kansas were not satisfied even though most of their grain was marketed in Missouri and was inspected by a state department. Quite the contrary, they were more dissatisfied since their grain was inspected by another state department over which they exercised no control. Besides, about one-half

of the elevator facilities at Kansas City were located on the Kansas side and were not under Missouri's jurisdiction.

As early as 1891, the Kansas legislature took the first step toward state grain inspection. The Warehouse Act of that year provided for a chief inspector, appointed by the governor, and for deputy inspectors for each board of trade, the deputy inspectors being appointed by the board of trade which they served. The Grain Board which established the grades was composed of the chief inspector and a representative from each board of trade in the state. This was only a half-way measure toward state inspection; it was not until 1897<sup>(1)</sup> that an inspection law, as such, was enacted. This act created a grain inspection department responsible to the state with all inspectors appointed by the state. The legislature of 1907 made slight changes in the law and in 1911 raised the inspection fees in order to make the department self-sustaining, which it had not been previously.

About one-half of the storage facilities of the Kansas City market are located on the Kansas side of the market, so that much of the grain that came to that market was stopped in the railroad yards of Kansas City, Kansas, and was stored in Kansas elevators. Most of this grain, however, was sold on the Kansas City, Missouri, board of trade, and was inspected by Missouri or the board of trade. Now, if Kansas provided for compulsory inspection of grain arriving on the Kansas side, it would mean double inspection of much of the grain arriving at the Kansas City market.

(1) Session Laws of Kansas 1897, Chapter 222.

(1)

This is what did happen in 1911 . The Kansas inspection department sought to make inspection compulsory into and out of elevators, public warehouses, which it interpreted to include practically all terminal elevators at Kansas City, Kansas. It also attempted to enforce compulsory inspection on all grain arriving at the city whether or not inspection was desired by the shipper. The operators of the terminal elevators naturally resented this action which increased their costs. Accordingly in March and April, 1911, they surrendered their licenses to the state, declared themselves no longer responsible for inspection and weighing, and thereafter refused the state inspectors to their yards, and failed to notify the inspection department of the arrival of grain. After the surrender of the warehouse licenses, many shippers marked their grain "No inspection desired, sell by sample". Nevertheless, the inspection officials claimed the right to inspect such consignments of grain.

(2)

The controversy was taken to the courts where the railroads contested the right of the state to inspect grain unless requested and attacked the constitutionality of the law. The chief points for consideration were; (1) Is inspection of all grain compulsory? (2) Are the defendant elevators public warehousemen? (3) Is the inspection law constitutional?

Considering these issues in the order of their importance, the elevators maintained that inspection of all grain was not

(1) In the Supreme Court of Kansas, No.17598, Plaintiff's Brief,p.26.

(2).In the Supreme Court of Kansas; The State of Kansas vs The Atchison Topeka and Santa Fe Railroad, etc. No.17,598.



compulsory, since the law did not provide for it specifically, whereas it stated definitely that all grain should be inspected into and out of public warehouses. The attorney-general did not dispute this argument of the elevators, but the grain commissioner maintained that even though the law did not provide definitely for compulsory inspection, nevertheless the wording of the law indicated clearly that the legislature had compulsory inspection of all grain in mind when it enacted the law. The working of the law is so clear in regard to inspection at elevators that there could be no mistake as to its meaning; the elevators did not contest the right of the state in this instance, but sought to evade the provision by proving that they were not public warehouses.

The part of the law defining a public warehouse was very indefinite and led to different interpretations. The law states that <sup>(1)</sup> "all elevators or warehouses, located in this state, in which grain is stored in bulk, and in which the grain of different owners is mixed together, or in which the grain is stored in such a manner that the identity of different lots or parcels cannot be accurately preserved, and doing business for a compensation, are hereby declared to be public warehouses". The state maintained that the legislature intended to include as public warehouses all elevators that mixed the grain of different owners and mixed the different lots of grain of the same owner.

The elevators took an opposite interpretation, believing that the legislature contemplated as public warehouses, only those elevators that mixed the grain of different owners, that the clause "or in which the grain is stored in such a manner that the

(1) Kansas Statutes.

identity of different lots and parcels cannot be accurately preserved" is explanatory of the first clause "in which the grain of different owners shall be mixed together". The question resolved itself into an interpretation of the word "lot" or "parcel", the state maintaining that the terms referred to the different assignments of the same owner or different owners. The elevators, on the other hand, declared that they meant the grain owned by different owners only and cited in support of their contention, the opinion<sup>(1)</sup> in *Smith vs Missouri*, in which the court held that "when the statute speaks of different lots.....it refers to lots belonging to different owners".

The elevators further attacked the law on the ground that inspection was inefficient, a burden upon the grain trade of the state, and a tax on interstate commerce. Considerable evidence was presented to show the incompetency of the state inspectors, and that grain which was reshipped to other Kansas markets frequently received a different grade on the second or third inspection. W.J.Graham, chief sampler for the Kansas City, Missouri, Board of trade, formerly chief supervisor for the Kansas grain inspection department, 1897-1908, testified that<sup>(2)</sup> he left the Kansas State inspection department, because of its inefficiency and political organization. C.W.Lonsdale also testified<sup>(3)</sup> that the Kansas City Board of Trade established a weighing department in 1901, and a sampling bureau in 1907, because state inspection was so inefficient.

(1) The State ex. rel Wood vs Smith, Mo.114, 21, S.W. 493.

(2) In the Supreme Court of Kansas, No.17,598, Defendants Counter Abstract, p.33.

(3) In the Supreme Court of Kansas, No.17598, Defendants Counter Abstract, p.25.



The evidence shows the grain trade's dissatisfaction with Kansas inspection, and that very little of the grain was sold outside the state on Kansas inspection.

It was also maintained that the inefficiency and the high fees made state inspection an undue burden upon the producer and the grain trade, that instead of being a protection to the grain trade in stabilizing the credit of the industry, it had become a burden and disadvantage. The act of 1911 provided for an inspection fee of one cent per thousand pounds per carload lots, and one cent per thousand pounds per carload lots for weighing "in" or "out". The inspection fee at Kansas City, Missouri, is fifty cents per carload and forty cents for weighing in. In the case of an average sized car of grain, 80,000 pounds, the inspection and weighing costs in Kansas were \$1.60, whereas in Missouri, they were \$.90. This was discrimination against the elevators on the Kansas side, especially since they had many extra inspections at the Kansas City Board of Trade. During the year ending June 30, 1910, <sup>(1)</sup> the Board of Trade at Kansas City, Missouri, handled a total of 34,880 cars on the Kansas side of the line, of which 26,322 or seventy-five per cent were also handled by the Kansas State department. This meant that three-fourths of the grain arriving at Kansas City, Kansas, had double inspection with an added cost of probably eighty cents per car or about \$20,000 for one year. If there had been any advantage in the two inspections to the grain trade, it would have gladly borne the added expense, but it represented a complete loss and further discriminated against the elevators of Kansas to the advantage of their competitors in Kansas City, Missouri, and other markets.

(1) In the Supreme Court of Kansas, No. 17,598, Brief for Plaintiff, p. 29.

The elevator operators also argued that the surplus revenues due to the high inspection fee was a tax on interstate commerce, and hence unconstitutional. The expenses of the state inspection department were \$55,000 to \$60,000 per year, and the receipts were \$70,000 to \$75,000, leaving a surplus of \$15,000. This small balance does not lead one to believe that the legislature intended the inspection fee to be a source of revenue; this amount is needed as a revolving fund. Former court opinions have sustained state inspection of goods, providing the fees are no more than enough to pay the expense of the service, hence the contention of the elevators was weak and insufficient.

In handing down its decision, the Supreme Court interpreted the law to provide for compulsory state inspection only on grain going into or coming out of public warehouses, that in the absence of express requirements for state inspection of other grain, and upon consideration of the entire act, inspection thereof is held not to be compulsory, "the provisions of the statutes with regard thereto being construed as referring to inspection upon request of the owner"<sup>(1)</sup>.

The Court's interpretation of the term "public warehouse" was favorable to the elevators. In its opinion, it said in part, "An elevator in which the grain of different owners is kept entirely separate, but in which the grain of the same owner delivered at different times is mixed together, except where he directs otherwise,<sup>(2)</sup> is not a public warehouse within the meaning of the statutes".

An elevator becomes a public warehouse only when it mixes the grain

(1) In the Supreme Court of Kansas, No. 17,598, Opinion, p. 1.

(2) In the Supreme Court of Kansas, No. 17,598, Opinion, p. 1.

of different owners, which was not the practice of the elevator in accepting grain for storage.

The Court said further, "The fact that the operator of a warehouse reserves the right to mix the grain of different owners has the same effect in determining its public character as though the grain were actually mixed"<sup>(1)</sup>. All the elevator operators, excepting one, reserved the right to mix the grain with that of other owners (of the same grade) if they so desired. On December 6, 1911, however, this reservation was abandoned, and the clause embodying it was omitted from the warehouse receipts thereafter issued. The elevators then, with one exception, were public warehouses when action was instituted by the state inspection department, but by omitting the right to mix the grain of different owners, they were no longer public warehouses, and were not responsible for state inspection of grain going into and coming out of their elevators. The law as a whole was held valid, only inspection of grain going into or out of public warehouses is compulsory, and the meaning of the term "public warehouse" has been determined.

The Kansas legislature of 1915, on the basis of the Supreme Court's decision, amended the inspection law, definitely<sup>(2)</sup> eliminating the possibility of compulsory inspection of all grain. The state inspection department is authorized to inspect such grain as is not marked so as to indicate that no inspection is desired. The section regarding fees was also amended; a maximum fee of sixty-five cents per carload is provided, which may be reduced at the

(1) In the Supreme Court of Kansas, No. 17,598, Opinion, p. 2.

(2) Kansas Legislature, House Bill No. 165.

discretion of the department when the expenses of the department warrant such a reduction. In order to prevent grain inspection in Kansas by the Kansas City Board of Trade, the law prohibits inspection and weighing by any person not employed by the state.

The problem of dual inspection in the Kansas City market is, therefore, only partly solved. There are still two state inspection departments contending for control of inspection in the market besides an inspection department maintained by the Kansas City Board of Trade, which secures samples on the Kansas side for inspection in Kansas City, Missouri. (1) Fortunately, the Missouri State and the board of trade departments work in complete harmony, and there is no duplication of inspection, but there is considerable competition, and hence friction between the Missouri and Kansas inspection departments. There is double inspection on the grain inspected on track and afterwards unloaded into an elevator in the other state.

Such conditions of grain inspection as exist at Kansas City defeat the highest efficiency of grain marketing. Here are two cities that are commercially one, and yet are burdened with the contentions of two ambitious state departments jealous of each other's jurisdiction, heaping uncertainty and added costs upon a thriving market. The grain trade, through its organization, is endeavoring to get representatives of each department to agree to

(1) Prices of Wheat to Producers in Kansas, Letter from Secretary of Agriculture to Congress, Document No.1271, Prepared by L.D.H.Weld and W.H.Kerr, Oct.1914, p.20.

accept the inspection of the other, but its efforts can not secure lasting harmony. These conditions suggest that some form of federal control is necessary to eliminate these contests of jurisdiction between the states that lead to so much friction, and interference with legitimate and prosperous trade.

A situation, similar to that at Kansas City, exists at the head of the Great Lakes. Duluth and Superior, because of their location, are commercially one, and yet they are divided by an imaginary boundary line, which places them under the jurisdiction of different states. Nearly all of the grain coming to this market is sold on the Duluth Board of Trade in Minnesota. There is a board of trade at Superior, which the city has encouraged in the hope of attracting the grain trade to Superior, but it is an impotent organization which sells most of the little grain it receives on the Duluth Board of Trade. However, the favorable location of Superior has attracted about one-half of the storage facilities at the head of the lakes.

In the absence of any Wisconsin or Board of Trade inspection at Superior, the Duluth Board of Trade graded all grain arriving at Superior prior to the adoption of Minnesota state inspection in 1885. <sup>(1)</sup> When the Minnesota state inspection superseded the board of trade inspection at Duluth, the Superior elevators asked Minnesota to extend its service to Superior. Technically, the Minnesota inspection department had no jurisdiction at Superior, which is located in Wisconsin, but in order to

(1) Annual Report of the Chief Inspector of Grain to the Minnesota Railroad and Warehouse Commission for the crop year ending August 31, 1906, p.7.

accommodate the elevators which were also transacting business in Minnesota, it consented to extend the service to Superior with the understanding that the elevators and merchants so accommodated would conduct their business in strict accordance with the Minnesota laws, rules and regulations, and also the rules of the Duluth Board of Trade.

Certain Wisconsin and Superior interests who are jealous of Minnesota's monopoly of the grain trade at the head of the lakes, were dissatisfied with the arrangement, and sought to discontinue Minnesota inspection at Superior.<sup>(1)</sup> In 1895 they secured a law from the Wisconsin legislature regulating terminal elevators and providing for Wisconsin state inspection at Superior. By thus securing independent regulation of the grain market at Superior, these interests hoped to attract the grain trade to that city. This object at once becomes apparent when Milwaukee, a grain market of considerable importance, was exempted from the inspection provisions. It is true that the terminal elevators at Superior needed regulation, but this could have been secured by a warehouse law permitting the use of Minnesota inspection certificates at Wisconsin elevators, and thus have obviated the division of the market into two inspection districts.

An inspection department was organized at Superior under the provisions of this law the following summer, but, after six weeks, discontinued operations and invited Minnesota to again extend its service to the grain trade at Superior. The request was

(1) Annual Report of the Chief Inspector of Grain to the Minnesota Railroad and Warehouse Commission, 1906, p.9.



granted and there was no further trouble until a Wisconsin citizen ill-advisedly, had the Minnesota inspectors at Superior unexpectedly arrested and brought before a Superior court <sup>(1)</sup> for trespass. No action could be secured against the inspectors since they were working under an agreement with Superior grain interests, so the case was thrown out of court. This occurred in 1902. Two years later, the Wisconsin legislature enacted another warehouse and inspection law, providing for grain inspection at Superior and the following year the market at the head of the Great Lakes was burdened with two inspection systems.

Minnesota grain interests opposed Wisconsin inspection on the ground that it was unnecessary. Practically all the grain arriving at Superior and Duluth is sold on the Duluth Board of Trade on Minnesota inspection. Superior inspects very little of the grain in cars on arrival, its work being confined almost entirely to grading the grain into and out of the elevators. The law provided for compulsory inspection of all grain going into or out of the Wisconsin elevators. Since the grain was inspected in cars for sale at Duluth, and must also be inspected by the State of Wisconsin when placed in a Superior elevator, it meant that much of the grain arriving at those markets had two inspections before it was finally stored in a terminal elevator. Instead of being an aid, Wisconsin thus became <sup>a</sup>burden to its own elevators, because of the additional inspection cost and discouraged rather than encouraged the growth of the Superior grain market.

(1) Annual Report of the Chief Inspector of Grain to the Minnesota Railroad and Warehouse Commission, 1906, p.9.



Ordinarily, the inspection costs are a lien upon the grain and the shipper bears the expense, but where there are two inspections, as at the head of the lakes, the shipper bears the first inspection and the elevator company bears the second. It was, therefore, the Superior elevators who felt the burden of Wisconsin inspection. It is true that the inspection fee per car is small and the additional cost of an individual car appears insignificant, but when we consider that Superior has an elevator capacity of over eighteen million bushels, and that one company received and shipped twenty million bushels of the 1914 crop, we can appreciate the significance of a small additional expense on the volume of grain that passes through Superior. Besides, it is inconvenient to have two inspections, leading to disputes and delays which may prove costly.

The Wisconsin elevator interests accordingly refused to abide by the provisions of the law, and attacked its constitutionality on the ground that it was unnecessary and a restraint of interstate commerce. They secured an injunction from the federal courts restraining the Wisconsin inspection department from inspecting grain until the matter was settled in the courts. Unfortunately, no decision was rendered to determine the relation of the two state inspection departments to this market, for a compromise was effected between the Wisconsin department and the elevators, and the Wisconsin inspection was resumed Jan. 1, 1908, with certain restrictions. (1)

This agreement was made possible by concessions by both parties concerned. (2) In essence, the Wisconsin inspection depart-

(1) Minnesota Legislative Grain Hearings at Duluth, 1913.  
 (2) " " " " " " " "

ment agreed to accept Minnesota inspection certificates on wheat and flax going into or out of Superior elevators; the elevators conceded the justice of Wisconsin inspection, and in return for the concession of the Wisconsin department, promised to accept Wisconsin inspection on coarse grains at Superior, and to reimburse the state for its loss due to litigation. This agreement is still in force. There is, therefore, no duplication of inspection on flax, and wheat, since these grains are all sold on Minnesota inspection, but there is double inspection on all coarse grains that are sold on the Duluth Board of Trade and then stored in Superior elevators.

Shippers have the privilege of calling for Wisconsin or Minnesota inspection, or both. The question is usually left to the commission firm, who invariably calls for Minnesota inspection, since that is the grade used on the Duluth Board of Trade. An occasional shipper calls for Wisconsin inspection hoping to secure a better grade thereby. In this event, two inspections are necessary since Minnesota inspection is essential to sell the grain on the Duluth Board of Trade. The grain trade believes that the Minnesota inspection is more uniform than Wisconsin inspection, and, therefore, prefers it, but the two standards of inspection are so similar that the shippers are not compensated for the extra expense and inconvenience, and so call for Wisconsin inspection only in rare instances. In so far as they do call for both inspections, there is an increased cost of marketing and unnecessary delay that may lead to a serious congestion of traffic when the grain movement is heavy.

There appears to be little justification for the existence

of Wisconsin inspection at Superior. It is a check upon the Minnesota department at Duluth, but this is unwarranted in view of the fact that the department is working efficiently and since the condition of dual inspection has so many serious aspects. It destroys the unity of the market, creating delay in the crop movement, friction among the trade interests, and general dissatisfaction. It is the source of much duplication of inspection which represents a complete loss and an increased cost of marketing. Such facts indict any commercial or political system which make these conditions possible.

A somewhat different situation is found in the relation of North Dakota and Minnesota. Duluth and Minneapolis are the natural outlets for North Dakota grain, but as they are located at a distance from the Minnesota-Dakota boundary line, there is no possibility of establishing a state inspection department to compete with Minnesota and to attract grain to Dakota markets as in the case at Superior. However, one member of the Wisconsin Grain Commission, which serves as the Board of Grain Appeals at Superior, is nominated by the Governor of North Dakota and is a Dakota citizen. So that indirectly the State of North Dakota competes with Minnesota by joining forces with Wisconsin.

This has not quieted the dissatisfaction of North Dakota producers. They are still obliged to sell their grain through trade organizations regulated by Minnesota, and pay for inspection of a department in which they have no voice. Being also unable to understand the transactions of the grain trade as conducted by the Minneapolis Chamber of Commerce and the Duluth Board of Trade, and appalled by the size of the business of such organizations, the

farmers of North Dakota look upon the markets with suspicion and believe that their grain, which has better quality than the other grain that is marketed at Minneapolis and Duluth, does not receive better grades; besides, they share the common complaint of producers who generally feel that terminal inspection is controlled by the buying interests.

The relation of the producer to the market leaves him in a frame of mind peculiarly susceptible to the influence of agitators and designing politicians who have made political capital of this sentiment, and have fanned the ember into a flame. In order to further their own interests, these people under the guise of helping the producer, have instilled into the minds of the producers and shippers exaggerated ideas of terminal abuses, and induced many of them to believe that the Minnesota inspection and weighing departments are in collusion with the terminal milling and elevator interests.

This situation has been a constant source of friction between the producers of the Northwest and the grain interests at the terminal markets. The state of North Dakota has no jurisdiction over grain in the Minnesota markets, so indirect methods of control have been a last resort. A committee of North Dakota bankers made a hasty investigation of marketing methods at Minneapolis and Duluth in 1906, and reported the discovery of glaring abuses. This report received wide distribution over the Northwest and by the time the legislature convened the following winter, the state was in a mood for action on the question. <sup>(1)</sup> The North Dakota

legislature accordingly sent a concurrent resolution to the Minnesota

(1) Annual Report of the Chief Inspector of Grain to the Minnesota Railroad and Warehouse Commission for the crop year ending August 31, 1907, pp. 7-11.

legislature, which was then in session, asking that Minnesota withdraw its opposition to Wisconsin inspection, revise its system of grades and dockage, and prohibit mixing at terminal elevators.

The Minnesota legislature replied firmly but courteously that Minnesota had never officially opposed Wisconsin inspection and that Minnesota inspection did not discriminate against North Dakota producers. The North Dakota legislature thereupon authorized an investigation of marketing methods. After a hasty survey of conditions of grain marketing, the North Dakota Board of Grain Commissioners reported to the Governor of North Dakota <sup>(1)</sup> recommending that the state lease and operate terminal elevators at Minneapolis and at Duluth to determine the advisability of erecting terminal elevators at those markets. The commission found market practices which it considered undesirable, but as regards inspection, it reported no abuses. However, it recommended federal inspection as a solution of the strained relation between North Dakota producers and the Minnesota grain trade. No elevators have been constructed as a result of this action; it doubtless set the Dakota producers at ease, but as far as securing a change in inspection at the terminals is concerned, no action was secured.

After North Dakota secured representation on the Wisconsin Grain Commission, it negotiated with Minnesota for a representative upon the Boards of Grain Appeal at Minneapolis and at Duluth. North Dakota believed that it was entitled to such consideration since its grain is sold in Minnesota markets. Upon the advice of the Minnesota Attorney-General, this co-operation

(1) Report of the Board of Grain Commissioners to Governor of North Dakota, 1908, pp. 26, 29.



was found to be impossible and contrary to the Minnesota law. However, North Dakota was offered the privilege of having a representative sit with the Boards of Grain Appeal, not in an official capacity, but to watch the inspection as a representative of North Dakota shippers. This opportunity was accept<sup>ed</sup> and the Governor of North Dakota appointed two commissioners to sit with those Boards, one at Minneapolis and the other at Duluth. These (1) representatives served from August 26, 1909 to December 31, 1910. Their report to the Governor of North Dakota commended Minnesota inspection highly and recommended that the state provide for permanent representation in Minneapolis and Duluth to guard the interests of Dakota shippers, but no such action has been taken. Considerable sentiment existed to erect a terminal elevator at Minneapolis and Duluth, and about the year 1910, a delegation representing a number of North Dakota elevators visited Minneapolis to consider the advisability of operating a terminal elevator in that market. They secured an option on an old elevator and tried to get a commission firm to operate it, but the available funds of the delegation were insufficient to finance such an undertaking, thus making it too hazardous for any commission firm to consider, and the plans of the North Dakota elevators, therefore, came to naught.

Systematic agitation and the investigations that had been conducted resulted in the enactment of a law which became effective in 1912 (2) providing for the construction and operation of terminal

- (1) Report of State Grain Commission appointed to serve on Minnesota Board of Appeals, Bismarck, North Dakota. North Dakota Public Document 26.  
 (2) Session Laws of North Dakota 1911.

elevators in Minnesota and Wisconsin. No elevators, however, have been built under this act. Moreover, a referendum was submitted to the voters of North Dakota in 1914, providing for the construction and operation of state terminal elevators within the state together with the maintenance of an inspection department, but owing to the absence of terminal markets and important railroad centers, the citizens considered such action ill-advised and defeated the referendum at the polls.

The Dakota producers appear to have a less hostile attitude toward the terminal markets during the past year, and the grain interests trust that it is an omen of a better understanding between them and the producers. If this is true, it is certainly fortunate; but it is more likely to be merely a lull in hostilities, for as long as the grain of the Dakotas is received at the Minnesota terminals and is sold by organizations controlled wholly by Minnesota, the producers of those states will be dissatisfied with the marketing of their grain. And when we consider that grain is their principal crop, we ought not to be surprised at their remonstrance, although we can not appreciate the hostile attitude which they have at times manifested.

State inspection of grain, as explained in Chapter I, has advantages over exchange inspection, but from the discussion of the problems at Kansas City, and at the head of the Great Lakes, and of the attitude of Dakota producers toward the Minnesota markets, it is evident that it too has inherent weaknesses. It is the old story of government failing to develop with expanding industry. Grain markets are no longer local; they are national and international, and a state political unit can not include the area of



large primary grain markets. Consequently, dissatisfaction will appear in that part of the market which is not represented in the control of the market organization, or the ambition of competing neighboring political or commercial organizations will lead to a division of supervision whenever possible. The solution of these problems appears to lie in a political organization large enough to include the territory of any market.

## CHAPTER IV.

## MINNESOTA INSPECTION.

## A.-History and Organization.

Grain inspection in Minnesota has passed through several stages of development, but for our purposes we may classify them into three periods, namely: (1) early inspection, (2) exchange inspection, (3) state inspection. The first two periods being but brief transitions to the third, we shall confine our discussion primarily to state inspection since it covers the longer period of time and deals with present inspection problems.

In Chapter I it has been explained how inspection develops simultaneously with the growth of markets. The early marketing at Minneapolis, which is Minnesota's oldest market of importance, resembled present methods of marketing at country points. The millers stationed buyers at the country markets along the Mississippi River, bought the grain directly from the producer, and shipped it by boat down the Mississippi or Minnesota Rivers to the mill. Grain was consequently bought on the basis of sample, not grade, as no grades had been established and there was no need for them so long as the producer was selling directly to the mill. Competition appears to have been very keen, so that the farmer received the full value for his grain.

As the production of grain increased in the territory tributary to Minneapolis and railroads were constructed to transport it to market, it became impossible for the flour mills to buy their grain direct from the producer, and much of it was bought through

middlemen. In order to guard against the fierce competition that frequently existed and to facilitate the crop movements, the Millers' Association was organized in 1877. This organization appointed a chief inspector, who supervised the grading of grain coming to the Minneapolis market.

Little had so far been accomplished in any market in regard to establishing scientific grades and efficient methods of inspection. Minneapolis, like Chicago, Kansas City, and other markets, was obliged to develop its own inspection system. Consequently, the early inspection was crude and inefficient. There were about five wheat grades, namely, No. 1 and No. 2 Hard, and No. 1, No. 2, and No. 3 Northern. Owing to the nature of the wheat lands, the grain was clean so there was no dockage system. Dockage for foreign material was worked out through the medium of price, the farmer with dirt in his grain receiving less than the market price of clean grain. Grain inspectors of that early period state that grain was easily graded, because of its uniformly high quality, that practically all of it graded No. 1 Hard or No. 1 Northern.

The first murmuring of agricultural discontent against grain markets was now heard in Minnesota; the producers were dissatisfied with the disposition of their grain. They no longer sold it direct to the mills, but shipped it to Minneapolis where it was graded by the millers' organization, thus raising a cloud of suspicion in the producer's mind. Grain inspection had become of commercial and economic importance.

In 1881, the Minneapolis Chamber of Commerce was organized and took over the function of grain inspection. It appointed the inspectors, and established the grades, which, however, were

similar to those used by the Millers' Association. This was a decided improvement upon the former inspection since the producers were represented through the commission firms of the Chamber of Commerce, but there was a prevailing opinion among the producers that the Chamber of Commerce was dominated by the buying interests so that the shipper was not adequately protected, and there was doubtless justice in this complaint. Minneapolis, being a milling center, consumed a large part of the wheat arriving at that market, and the buyers wishing to buy on the lowest grade possible brought pressure to bear to secure severe inspection.

As early as 1881<sup>(1)</sup>, the year the Minneapolis Chamber of Commerce was organized, a bill was introduced in the legislature providing for state inspection, and although it did not become a law, it is an index of the dissatisfaction of the agriculturists of the state. It appears to have been one of the chief topics of interest at farmers' meetings. The meeting of the Farmers' State Board of Trade<sup>(2)</sup> at St. Paul loudly denounced the unfairness and inefficiency of inspection. The same spirit is evidenced in the petition<sup>(3)</sup> from the Farmers' Alliance of Blue Earth County to the state legislature in 1883, asking that grain grades be established on the basis of chemical and microscopical examination, since it believed that the grading was poor and that a better system would be to the interest of the producers. Having failed to secure state

- (1) Northwestern Miller, Vol. 15, p. 47, 1883.  
 (2) Northwestern Miller, Vol. 15, p. 47, 1883.  
 (3) Northwestern Miller, Vol. 15, p. 33, 1883.

inspection, the producers the following year, 1884, petitioned  
 (1) the governor to call a special session of the legislature to  
 relieve the country of the present inspection system. The governor  
 evidently did not consider the question of sufficient importance  
 to convene the legislature, so no tangible results were secured.  
 The Northwestern Miller, commenting upon the petition editorially,  
 advanced the stock argument of the grain trade that state inspec-  
 tion would be an opportunity to place political favorites, and  
 become a political machine.

Duluth had also become a market of considerable importance  
 with the development of railroads and an increase in grain  
 production. It was the outlet for a large part of the surplus  
 grain of the Northwest that was exported. The Duluth Board of  
 Trade furnished the first inspection in that market. In 1884, at  
 the invitation (2) of the Duluth Board of Trade, the Minneapolis  
 Chamber of Commerce and the Millers' Association sent a committee  
 to Duluth to consult on getting uniform grades in the two markets.  
 There was considerable dissatisfaction in Minneapolis because the  
 inspection was more liberal at Duluth and was attracting too much  
 grain to that market, which seems to justify the producers'  
 complaint that the Minneapolis market was dominated by the millers  
 and inspection was severe. Whether or not the Millers' Association  
 was influential enough to have raised the standard of inspection  
 at Duluth at that time, is difficult to say, since the following  
 year, 1885, the Minnesota legislature passed a law providing for  
 state inspection, and exchange inspection became a thing of the

(1) Northwestern Miller Vol, 17, p.28, 1884.

(2) Northwestern Miller, Aug. 22, 1884.

past in Minnesota.

The State Railroad and Warehouse Commission, which was given control of grain inspection, immediately began the organization of the department and by autumn was prepared to grade the crop of 1885. The short time that was given to organize the department made it impossible to conduct extensive investigation upon which to base grade standards, and besides it would have worked a hardship on the trade to have made many radical changes; it was more practical to make the needed changes slowly, one at a time.

The grades that the state adopted were, therefore, very similar to those that had been used by the exchanges. The wheat grade No. 2 Hard was discontinued and an official dockage for wheat was adopted. The latter provision was not an innovation since the exchanges, although no dockage was provided in their rules, had made it a practice to allow deductions for foreign material out of deference to the Millers' Association. <sup>(1)</sup>

The state inspection system is a part of the organization of the Railroad and Warehouse Commission. The commissioners appoint a chief inspector whose term is for two years <sup>(2)</sup>, unless sooner removed by the commission. A \$10,000 bond is required of the chief inspectors for faithful and impartial discharge of his duties. He has general supervision of inspection in Minnesota and appoints deputy inspectors for each market with the consent of the commission. "One such deputy in each of the cities of St. Paul,

{1} Northwestern Miller, August 22, p. 28, 1884.  
 {2} Revised Statutes of Minnesota 1913, Section 4455.



Minneapolis, and Duluth shall be styled 'chief deputy'<sup>(1)</sup>, and each chief deputy has supervision of the market where located.

This organization had exclusive charge of grain inspection until 1900 when an auxiliary department was organized, in accordance with the laws of 1899, to pass upon the grading of the inspection department. This organization was known as the Board of Appeals, but its name has since been changed to the State Board of Grain Appeals. The law<sup>(2)</sup> provides for one Board at Minneapolis and one at Duluth. Each Board shall consist of three members appointed by the governor, who shall have the same qualifications as grain inspectors, and not more than two of whom shall be of the same political party. Their term of office shall be for three years, one member retiring each year. The appointments were originally for two years, but have been wisely lengthened to three years, thus retaining two experienced members on each Board every year.

Grain in the Minnesota markets may, therefore, be inspected by one or two organizations provided by law, namely the inspection department, whose inspectors are appointed by the Railroad and Warehouse Commission, and the Board of Grain Appeals, whose members are appointed by the governor. In order to understand the need for these two departments, a brief description of grain inspection should be given. Let us assume that a car of wheat arrives at the Minneapolis market. The inspection department at Minneapolis sends an official sampler to get a representative

(1) Revised Statutes of Minnesota 1913, Section 4456.

(2) Revised Statutes of Minnesota 1913, Section 4448.

sample of the car of grain; the sample is taken to the inspection office and there passed upon by an inspector, who gives it a grade, and in the case of wheat, dockage. The owner or his representative, a commission merchant, may not be satisfied with the grade or dockage and may ask for a reconsideration of the grade and dockage, this is known as a "re-inspection". If the original inspection is sustained, the owner may still be convinced that the grain is wrongly graded and unless there is some other body to whom he may appeal, he has no recourse from his original inspection. It is for such occasions that there is a demand for an organization to pass upon the inspections which the owner of the grain believes to be wrongly graded, and it is to provide for such occasions that the Board of Grain Appeals was organized. When the Board of Grain Appeals passes upon an inspection it is known as an "appeal".

The purpose of the Boards of Grain Appeals, therefore, makes it essential that they be independent from the inspection department. However, the independence of the two organizations is not complete since the Boards of Grain Appeals establish the rules for inspection, and the inspection department determines and collects all inspection, re-inspection, and appeal fees. Under very extraordinary conditions this might make the Boards of Grain Appeals amenable to the inspection department, but no such instances have occurred and for all practical purposes, the two organizations work independently, although there is a necessary amount of co-operation.

Thirty years have witnessed many changes in Minnesota inspection. One of the chief innovations, already suggested, is the adoption of the Boards of Grain Appeals. Prior to 1900,

appeals were made to the chief inspector and the railroad and warehouse commissioners, who constituted the appeal board. As their offices are at the capitol, the machinery for appeals was very slow, and very few appeals were consequently made. By providing an appeal board in each of the two chief markets, appeals can be quickly procured at the nominal cost of one dollar instead of five dollars as formerly.

An important feature of inspection is sampling; unless a correct sample of the grain is secured, the grade will be of little value. Hence, competent and efficient sampling is necessary. The first work of the inspection department is to secure samples of the grain. For this purpose, a corps of samplers are stationed in the terminal railroad yards to sample grain on arrival that has been left on what is known as the "inspection tracks." Men are also stationed at the terminal elevators to sample the grain moving out of store. In order to facilitate the movement of grain, sampling stations have been established at outlying stations on the railroads that are the heaviest carriers. Here, samples are secured from the cars which are sidetracked and these samples are sent by express to the inspection office at Minneapolis or Duluth, according to the destination. In this way, the grain is often disposed of before it reaches the market, and thus tends to prevent congestion in the terminal yards. A serious objection to this practice is that the sample may not represent the lot of grain from which it is taken. The condition of the grain may change in the time necessary for it to reach the market, or the sample may become dryer, owing to exposure, to heat, and light. This

objection, however, is not serious enough to warrant the abandonment of sampling at these country points and thus relieving traffic congestion.

The samplers begin work early in the morning as soon as it is light enough to work. They are accompanied by a chief sampler, who supervises the sampling. They are preceded by an official who examines the cars for leakage and who breaks the seals of the car and records the seal number. The car is then ready to be sampled. For this purpose the sampler has a brass probe about six feet long and two inches in diameter with a plunger and small openings along the side. He thrusts this into the grain and thus secures a sample of the grain from the top to the bottom of the car. As many plunges are made as is necessary to get a representative sample. Formerly, a minimum of three probes was required; this was later increased to five, and in 1914, it was further increased to seven. This change was actuated by a desire to secure greater efficiency and was partly made necessary by the greater number of "set up" or "plugged" cars. By a "set up" is meant a car of grain that is loaded in such a way, with poor grain in certain parts of the car, that it is evident the shipper intended to deceive the buyer as to the contents of the car.

The representative sample is placed in a bag and accompanied with a certificate bearing the car number and the sampler's initial, together with any remarks. In case of a "set up" an additional sample is taken of the inferior grain and accompanies the representative sample with notations as to the location and amount of the poor grain. When the samplers in a yard have completed their work, exchange samplers enter the car to secure

a sample for the grain trade and for use on the exchange floor. They are not allowed in the car with state samplers, which obviates the possibility of any trade influences effecting the state's sampling. These private sample bureaus afford beneficial competition which spurs the state samplers to greater efficiency. When the samples have been secured the car is re-sealed with a state seal and the number recorded. The samples are then gathered and sent to the inspection office.

Prior to 1904, the sampler was accompanied by an inspector with testing apparatus to inspect the grain at the car door. (1) It was found that the inspectors were slighting the grading of coarse grains, since the grain trade paid little attention to the state's certificates, so indoor inspection was adopted for these grains in 1904; two years later arrangements were also completed to grade all grain indoors. The inspection of grain is a matter of human judgment; the inspector must depend upon his senses and hence can work more efficiently when heat, light, and moisture conditions are uniform. These are best secured indoors where the environment can be controlled. Besides, better supervision, and hence greater uniformity can be secured where all inspectors are working in one room under the direct supervision of the Deputy Chief Inspector. The grain trade is unanimously of the opinion that indoor inspection has secured more efficient and uniform grading. It is to the credit of the Minnesota inspection department that it was the first to adopt this system.

(1) Annual Report of the Chief Inspector of Grain to the Minnesota Railroad and Warehouse Commission, 1904, p. 7.

Having secured the grain samples and taken them to the inspection office, they are now given to an inspector to grade. Each inspector is provided with a test kettle, sieves, and any other apparatus necessary to determine the grade. After examining the sample carefully, he decides upon a grade, or in case of doubt, consults the chief deputy inspector. The grade is recorded upon an inspection certificate together with the inspector's initials, and is put on the records of the department. The inspector has no way of knowing who owns the grain; the only information accompanying the sample is the car number and the sampler's initial. He does know whether it is inspection on grain arriving or leaving the market, but even though it is going out of an elevator, he is not certain of its ownership.

If re-inspection is called, the grain is not passed upon by the inspector who gave it the original grade, but it is inspected by one of the two second deputy inspectors or the chief deputy. The same sample is used for re-inspection and appeal, unless the owner of the grain shows that it has been improperly sampled, whereupon a new sample is procured. No one interested in the grade of the grain is allowed near the inspector while he is working, in this way eliminating the possibility of trade influence upon the inspection. The representative of the grain is frequently present when it is re-inspected and appealed, but they are made by more experienced officials; hence the possibility of being influenced by the trade is more remote than for the original inspection. The policy of the department is to grade grain impartially without regard to any grain interests.

One of the dangers of a governmental department is that it



will become the victim of the "spoils system", or through political preferment certain powerful trade influences may secure control of the office and use it to their own personal advantage. Such a condition would destroy the purpose of state inspection, first because it would not be impartially administered if controlled by any trade interest, and second, because efficiency could not be secured if inspectors were changed at the discretion of the political party in power.

One of the essential pre-requisites for an efficient inspector is experience; the nature of grain judging is such that it requires years of experience to become an expert. Hence, an inspection office <sup>to</sup> efficient <sup>be</sup> must encourage and secure long tenure of office.

This was the chief argument against the adoption of state inspection and the fears of the grain trade appear to have been realized during the first years of state inspection. Not that any particular grain interests secured control of the department, but it was the victim of political preferment, appointments and promotions frequently being made on the basis of political affiliation and not examination,

This was made possible by the method of appointment. The governor appointed the Railroad and Warehouse Commissioners who in turn appointed the inspectors, so that when there was a change in political administrations, it was often advantageous to the party in power to appoint new inspectors. The last occurrence of this nature was in 1900 when a democratic administration superseded the republican control. New appointments were made wholesale by that administration, until the inspection force

at Duluth was almost completely changed and the department at Minneapolis missed many familiar faces. The Railroad and Warehouse commissioners have been elected rather than appointed since 1900, and coincident with this change the commission has adopted a system of promotion by examination.

In this respect the law has not been changed; it still provides for appointment of inspectors, but it is a recognized policy of the Railroad and Warehouse commission to promote men only on merit, after having proven their competency to grade by a series of examinations. Inspectors are no longer taken from private life, but they must begin as a sampler and gradually work their way up; they are promoted as vacancies occur and they prove their ability to grade grain.

The Minnesota Legislative Grain Investigation of 1913 disclosed the fact that several of the principal inspectors were former employees of Minneapolis grain firms. However, it should be noted that these were the older men in the department, who had received appointments before they were made on examination. If this were the present source from which inspectors are secured, it would be highly undesirable and deserve the greatest condemnation because of the effect and influence upon inspection; the integrity of the inspectors would not necessarily be questioned, but after having bought or sold grain for a number of years, one's attitude toward grades becomes more or less fixed and it is difficult to change to become an impartial judge of grain and do justice to both shipper and buyer. But fortunately this system of appointments no longer exists in Minnesota and the department is free from trade influences in this respect.

We have discussed the attitude of the producers toward Minnesota inspection department and their feeling that its grading is too severe, because of the influence of buyers who are in closer relation to the department than the producers. When the Boards of Grain Appeals were organized, it was generally understood that they were to provide not only a body to which inspections might be appealed, but they would also provide a branch of the inspection service farther removed from trade influences, which would particularly guard the interests of producers. The rules which the boards have established and the disposition of the appeals, which are more lenient than the grades of the inspection department, tend to show that they do favor the interests of the producer and shipper. Consequently, there has been much criticism of the work of the Boards of Grain Appeals by the terminal buying interests.

A just and more serious criticism is the personnel of these Boards of Grain Appeals, which at times has been poor; members who have no knowledge of grain have been selected, a mechanic and an editor of a newspaper having served at different times; farmers and country elevator operators with a limited knowledge of grain are frequently appointed. And yet these Boards establish the rules and pass upon the grades of the inspection department whose inspectors are expert judges of grain. The relation of these two organizations makes the standards of the inspection department conform to the standards of the Boards of Grain Appeals, and thus tends to place the efficiency of the inspection department on a par with the service of the Boards of Grain Appeals, whose members are least qualified to determine standards.

The theory of having a separate organization farther removed from trade influence, to pass upon the work of the inspection department is good; it is a question of securing an inspection department and Board of Appeals which are impartial to all trade interests, and which will provide the most efficient service. They must, therefore, be independent of trade and political organizations, and to secure this, a civil service seems necessary. It is true that the Railroad and Warehouse Commission, because of agitation for better inspection service, promote by examination, and have thereby secured more efficient grading, but the original appointments are not made according to civil service standards, so that it does not have a regular civil service system. The members of the Boards of Grain Appeals are frequently re-appointed, depending upon the political organization in control, thus serving six years, but there is no recognized policy of re-appointments or long tenure of office.

The suggestion has been made to make the inspection department independent of the Railroad and Warehouse Commission, and to make it a separate state department. The Railroad and Warehouse commissioners are chosen for their knowledge of public utilities and not because they are expert judges of grain, so that they are not particularly qualified to supervise this aspect of grain marketing. At the present time, they do not take an active part in the inspection service; they merely appoint the chief inspector and confirm his nominations of deputy inspectors and samplers. Besides, grain inspection is sufficiently important in Minnesota to warrant an independent department; it now has over three hundred employees and collects nearly one-half a million

dollars in fees annually. However, these two branches of the inspection service, whether they are separate state departments or not, should be on a civil service basis. This would make them completely independent of trade and political organizations, maintain the present relation of the two state organizations, and thereby provide the trade with an impartial, more uniform, and more efficient inspection. It will mean much to Minneapolis and Duluth if they are to maintain their high rank among the markets of the world.

## B. - Grade Standards.

There are two ways by which we may judge the standards of an inspection department, and both must be considered in discussing the standards of grading. In the first place, there are the grade descriptions or definitions which are arbitrarily determined by the inspection department. In the second place, there is the standard of interpretation and application of the grade definition. Grain inspection is largely a matter of judgment since no mechanical tests are wholly adequate. Consequently, it is quite as important to know the interpretation of a grade definition as to know its wording.

The standards for grades are of much concern to the grain trade and producers since it is on the basis of them that grain is largely bought and sold, and any change in the standards may cause serious loss. The Minnesota grades are established by the Boards of Grain Appeals. The law provides that "the two boards, or a majority of the six members thereof, shall meet annually in joint session on or before September 15, and establish the grades of all grains subject to state inspection, such grades to be known as the Minnesota grades".<sup>(1)</sup> The boards have made it a practice to announce a public hearing to which the grain trade is invited to present its views on inspection problems and on any proposed changes. The trade takes advantage of this opportunity to tender advice on the grade rules and is usually well represented. After hearing the arguments of the trade, the boards go into executive

(1) Revised Statutes of Minnesota 1913, Section 4452.



session and decide upon the grades for the following year. Then, according to law, they are published daily for one week in a newspaper at Minneapolis and Duluth.

The following are the Minnesota official grades for Northern Spring wheat for the crop year 1915-16.

"NO.1 HARD SPRING WHEAT ----- Shall be dry, sound, bright, sweet, clean, and consist of over 50 per cent of the hard varieties, and weigh not less than 58 pounds to the measured bushel.

"NO.1 NORTHERN SPRING WHEAT ---- Shall be dry, sound, sweet, and clean, may consist of the hard and soft varieties of spring wheat, and weigh not less than 57 pounds to the measured bushel.

"NO.2 NORTHERN SPRING WHEAT ---- Shall be dry, spring wheat, not clean enough or sound enough for No.1, but of good milling quality, and must weigh not less than 56 pounds to the measured bushel.

"NO.3 NORTHERN SPRING WHEAT ---- Shall be composed of inferior, shrunken spring wheat and weigh not less than 54 pounds to the measured bushel.

"NO.4 NORTHERN SPRING WHEAT --- Shall include all inferior spring wheat that is badly shrunken or damaged and weighs not less than 49 pounds to the measured bushel.

"REJECTED SPRING WHEAT ---- Shall include all varieties of spring wheat sprouted, badly bleached or for any other reason unfit for No.4.

"NOTE --- Hard flinty wheat, of good color, containing an appreciable mixture of soft wheat, may be admitted into the grade of No.2 Northern Spring Wheat and No.3 Northern Spring Wheat,

provided weight of same is not more than one pound less than the minimum test weight required by the existing rules of said grades and provided, further, that such wheat is in all other respects qualified for admission into such grades.

"NOTE --- The variety known as Humpback, owing to its inferior milling quality, shall not be graded higher than No.3."

Another spring wheat grade is used that is known as "No Grade" and includes wheat that is unwarehouseable, because of excessive moisture and is applied to wheat bearing fifteen or more per cent of moisture. By proper treatment this grain may be dried and have a good commercial value which accounts for the good prices received for some of the "No Grade" wheat.

The Minnesota grades are similar to those used in other markets; in general, they are the grades promulgated by the National Grain Dealers' Association in 1908 and recommended to the exchanges for adoption. The spring wheat grades, however, differ from those of other markets in one important feature; Minnesota uses the dockage system, whereas other markets, excepting Chicago since 1913, use what is known as the "percentage basis". The term "dockage" refers to the foreign material, weed seed, dirt, etc. in grain and by the "dockage system" is meant the policy of deducting the weight of the dockage from the gross weight of the grain. If there are two pounds of dockage on a fifty-bushel load of grain, the buyer will deduct one hundred pounds from the gross weight of the load before determining the number of bushels of grain for which he will pay. The foreign material, therefore, does not lower the grade, except where it lowers the milling value of the grain. The term "percentage basis" refers to the policy of

establishing a maximum percentage of foreign material that may be allowed in the different grades.

The dockage system is used only on wheat; Minnesota grades for the other grains are determined only after the foreign material is considered; this is not worked out on a percentage basis for barley and speltz, but it is a considerable factor nevertheless. The most important change in the grades for 1915-16 was the adoption of a percentage basis for oats; i. e., the per cent of dirt and other seeds that is allowed in each grade has been determined. The "standard grade" was also adopted. There had been complaints from the trade that Minnesota had no grade that corresponded to the "Standard Grade" or contract grade at Chicago, so that the grades of the Grain Dealers' Association were adopted in order to accommodate those Minneapolis dealers who ship oats to Chicago.

In 1914, the state adopted the federal corn grade, which are more scientific than the former grades, since they provide for six grades instead of four, and the percentage of damaged corn, foreign material, and cracked corn are determined more definitely and scientifically. The corn crop of 1914 was unusually dry and uniform in quality and the crop of 1915 was extremely poor, so the federal grades have not had a fair trial. However, the trade is well satisfied with the results and the only criticism comes from the inspection department which believes the foreign material should be made a dockage since a high per cent of separable dockage often throws the corn into a grade poorer than it is entitled to.

There has been a movement that has secured some headway

to provide a system of dockage on oats and barley. The commission men have opposed the proposal since Minneapolis and Duluth would be the only markets having a dockage system, and they believe it would tend to discourage shipments to their markets and thus work a hardship on the Minnesota markets. This again raises the question of whether or not a dockage system is preferable to a percentage system. This question will be considered at length in a following chapter, so we will not consider the subject further at this point.

Spring wheat, which is the most important grain marketed at Minneapolis and Duluth, has been the center of attention in promulgating grades. The number and description of the wheat grades has not materially changed since state inspection has been adopted. The policy of the department has been to maintain the same standards from season to season, and only such changes are made as it believes to be warranted by trade and crop conditions. However, many of the pioneers in the Minnesota markets are of the opinion that the standards of grading have been lowered, even though the grade definitions have remained almost the same, not that the grading is any less uniform, but that some grain which now grades No. 1 Northern would have been given a lower grade in former days of the market. This they attribute to the poorer quality of the grain raised in the Northwest. As the land has lost its virgin fertility and become foul, it no longer produces grain of a uniformly high quality. But the fertility has been depleted slowly and the grain has become gradually inferior from season to season so that, in the absence of flour laboratories, one can readily understand how the inspection department might easily, gradually, and unconsciously lower its former standard of inspection.

Then, there is the problem of classifying new varieties of wheat. Many new varieties have been introduced in the past few years in order to secure better yielding grains, to obtain drought- and rust-resisting varieties, and, in the case of wheat, to secure superior milling quality. A heavy yielding wheat that is attractive to the producers is often a poor milling variety, so that while the producers look upon it with favor and continue to produce it in increasing quantities, the miller is suspicious of its value; in fact, the millers are always cautious in buying new varieties. This has in a few instances led to controversy between buyers and producers as to how such varieties should be classified. The producers, to guard their interests, wish to secure a good classification, while the buyers, being suspicious of its value, will work for a severe classification.

The variety that has caused the most heated discussions and the most bitter feeling is velvet chaff. This is a heavy yielding wheat that matures earlier than fife and blue stem, has a rich color, and is apparently a good milling wheat, thus being well adapted to certain sections of the spring wheat belt and very popular with producers. When it first came into the market, the inspection department gave it a separate classification and it was graded No.1 Velvet Chaff, No.2 Velvet Chaff, etc., because the millers complained of its poor milling qualities. But the producers were opposed to this method of grading it, because they believed it discriminated against a good wheat, a wheat which had the appearance of good milling value and which certain chemists found to be little inferior to the favorite varieties, fife and blue stem.

The opposition of the producers became so strong that after being graded as Velvet Chaff one year, it was graded Northern wheat, but no higher than No.2. The buyers did not object to this arrangement since it was not included in the contract grade, but the producers were still dissatisfied and very bitter against what they termed unfair discrimination by the millers. Numerous tests and investigations convinced the state department that velvet chaff was not as inferior to fife and blue stem as the millers maintained and that it compared favorably enough to be graded No.1 Northern if otherwise up to standard. Accordingly, the request of the producers was granted in 1912 and velvet chaff has since been graded Northern without discrimination.

This action has caused the most bitter criticism by the milling interests, who admit that velvet chaff wheat has improved as it has become acclimated, but maintain that it is still inferior to blue stem and fife and should not be graded as Northern wheat. Velvet chaff wheat still sells on the cash market at a discount of two or three cents under fife and blue stem of the same grade. This is doubtless a close margin than if it were graded as No.2 Northern or as Velvet Chaff, but there are other features of economic importance.

It is generally recognized by those people who are familiar with flour milling, that velvet chaff is inferior to fife and blue stem wheat, although the degree of inferiority is a question of dispute. This, therefore, is certain, that to allow a variety of poorer quality to be graded as No.1 Northern increases the range of quality of grain within that grade. This has commercial importance since the purpose of inspection is to



give the buyer a definite idea of the characteristics of the commodity purchased; so that the greater the spread between the best and the poorest quality of grain allowed within a grade, the less importance the buyer attaches to the grade. Now, the range of two or three cents between velvet chaff and blue stem wheat may not represent a wide variation in the quality of the grade, but when this is added to the variation that exists within each variety in the grade, the spread of the grade is considerable.

Where grain is sold on sample only, the grade fixed by the inspector is naturally of no consequence, and does not effect the price, but when the sample and the official grading are used as in Minnesota cash markets it influences the price, although not as much as in the future contract sales, since in cash sales a sample of the grain is at hand and the buyer relies partly upon his own judgment. In the case of "futures", conditions are different. Here, a buyer contracts to buy a certain amount of grain of a given grade at a given price, No. 1 Northern being the grade of wheat called for on contract in Minnesota markets. When the buyer of a "future" makes his contract, he does not agree to purchase any particular lot of grain, but contracts to accept grain of the contract grade. Obviously, he is aware that the seller will deliver the poorest quality of the grade and it is upon the lower margin of the grade that he makes his bid. The effect of this is to drag the price of all grain of the grade down to the price of the grain of the poorest quality, the man with the choice grain receiving no more than the one with the poorest of the grade. This price is reflected back upon the cash sales since it increases the demand for the poorer grain

that is now graded as No.1 Northern and may be used to fill contract deliveries, and thus the spread in the price of No.1 Northern cash wheat does not correspond to the spread in the range of quality of the grain of that grade.

Let us consider the effect of this ruling as to velvet chaff wheat upon the "future" trading at Minneapolis. The flour mills do not want velvet chaff wheat if they can secure fife and blue stem varieties, so it is taken largely by the elevators which use it to fill their contracts, and it is more profitable for them since they buy it cheaper than the other two varieties, and it will command the same price on delivery. Now, the flour mills expect to receive velvet chaff or a wheat mixture with a large per cent of velvet chaff when they take their contract "deliveries", but since they do not want it, they do not take "deliveries" on their options if they can secure better types of cash wheat or have storage facilities to accommodate their own needs. Since the enactment of the rule in 1912, the Minneapolis mills have made it a policy to accept as small amounts of grain as possible on "delivery" and they are constructing storage facilities to supply their own needs and not be dependent upon the terminal elevators. This has left many elevators full of velvet chaff wheat after the May "deliveries", which has meant a loss to them besides tending to impair the function of the speculative market. Members of the grain trade believe that it has made Minneapolis a poorer speculative market, but this is extremely difficult to prove. It is evident, however, that the future price is based upon the probable value of the poorest grain in the contract grade, and since velvet chaff sells at a discount below types of

grains that were formerly deliverable, the option market will tend to be lower by the amount of the discount.

There are also disadvantages in having a small range in the characteristics of the grain allowed in a grade. In the first place, the range may be so small that it makes inspection difficult. In the second place, there is the possibility of getting the contract grade so narrow that the volume of grain of that grade would be inadequate for purposes of "future" trading and the market could be "cornered". Of course, there is always the opportunity to change the contract grade under such conditions, but such action would usually be undertaken only after the market was "cornered" when powerful interests might make a change impossible. In order to obviate this possible condition, it is common practice for the exchanges to permit the delivery of a grade lower than the contract calls for at a discount. The Minneapolis Chamber of Commerce permits the delivery of No.2 Northern at a discount of  $3\frac{1}{2}$  cents. Of the total grain received at Minnesota markets, 21.4 per cent graded No.1 Northern in 1911-12, 43.9 per cent in 1912-13, 44.4 per cent in 1913-14, and 22.6 per cent in 1914-15; <sup>(1)</sup> No.1 Northern and No.2 Northern together represented over one-half of the receipts, except in 1914-15 when they represented 44 per cent. These figures show the wisdom of permitting the delivery of No.2 Northern at a discount under the contract price; even though the grain at the Minnesota markets is of a uniformly good quality, nevertheless it is desirable precaution against "corners" in an abnormal season.

The question of changing grades is of commercial importance to the grain trade; not only is it inconvenient to learn to apply

(1) Annual Report of the Chief Inspector of Grain to the Minnesota Railroad and Warehouse Commission for the crop year ending August 31, 1915, p.9.

new standards, but it may result in serious loss unless ample warning is given of the change. Options extend over several months and if the contract grade is changed before delivery, it means loss to either buyer or seller, and where millions of bushels are daily bought and sold in this way, only a slight change would result in enormous loss. The exchanges commonly provide for such an emergency by requiring the delivery of grain of the same grade description contracted for. This problem has been one of the chief subjects of contention in the pending bill providing for federal inspection; the bill originally provided for no change in grades that had once been established, but the grain trade insists that there should be some provision for changing them to meet changing conditions. No doubt such a provision could be abused unless carefully guarded and conservatively administered. However, the purpose of an inspection department is to aid the grain trade and facilitate the crop movement and should, therefore, change its rules to meet trade conditions rather than to require the trade to conform to standards of grading that can not be changed.

The aim of the Minnesota department has been to make changes in the grades only when warranted and to secure more scientific standards. There is a division of opinion as to the wisdom of grading velvet chaff wheat as No. 1 Northern, but the above discussion and analysis suggests that it would have been better policy to continue the separate classification of that variety as at Chicago. The adoption of the present oat grades and federal corn grades certainly marks improvement for those grains. By adopting indoor inspection, special sieves, and other apparatus, the department is attempting to secure uniformity of

inspection. The establishment of a flour laboratory at Minneapolis in 1913 in connection with the inspection department is helping to secure this end, but the volume of grain is so large at both Minneapolis and Duluth that the great bulk of the grain will always have to be inspected upon its physical characteristics, i. e., the inspectors will have to rely largely upon the weight, dryness, plumpness, sweetness, and cleanness of the grain instead of upon chemical or baking tests. However, occasional samples upon which there is some question may be taken to the laboratory for baking test, and thus not only secure more uniform inspection, but provide grades on the basis of the commercial value of grain. Much remains to be done in making the grades more scientific; the percentages of foreign material permissible are still to be determined for some of the grains that have no dockage; new varieties will continue to be introduced so that the laboratory may assist in the solution of the problems growing out of future changes.

It would be extremely interesting to compare Minnesota and Illinois inspection upon the same lots of grain, but since such data are not available, we will base our comparison upon grade descriptions and upon general observation. With the exception of spring wheat, the rules for the grades in the two markets are almost identical; each uses the grades recommended by the National Grain Dealers' Association, but the spring wheat grades have one important difference; Chicago has divided its spring wheat grades into three types, namely, Northern, Spring wheat, and Velvet Chaff, whereas Minnesota includes all Spring wheat in the one class of Northern. Minnesota Northern wheat includes both soft and hard varieties of Spring wheat but the Chicago definition of

Northern requires 50 per cent of the hard variety and not more than 15 per cent of velvet chaff. The Illinois Northern grades, therefore, have the higher standard since hard spring wheat is more choice for milling than the soft varieties.

The opinion is quite general, however, in the Minnesota markets and among the producers in certain sections of the Northwest that are tributary to both Chicago and Minneapolis, that the actual grading of spring wheat is more liberal at Chicago just at present. This, they say, is particularly true of velvet chaff wheat; that grain of this variety that grades No.1 in Chicago often grades no better than No.2 at Minneapolis. This does not appear to have been a permanent difference, but exists this season because of unusual crop conditions. A wet harvest made the winter wheat crop of uniformly poor quality so that the supply of contract winter wheat at Chicago is below normal; this makes a strong demand for velvet chaff wheat, which has a better color than winter wheat, and which blends very well with the winter wheat when mixed in small quantities. Incidentally, this shows how a trade condition may affect the inspection at a market. In previous seasons Chicago inspection has apparently been as severe as Minnesota's, in fact it has been no uncommon occurrence for wheat that has graded out of Minneapolis and Duluth as Minnesota No.1 Northern to fail to grade Northern in Chicago, because it was the velvet chaff variety or had a high per cent of velvet chaff.

One of the problems of Minnesota inspection has been to maintain uniformity between Minneapolis and Duluth. Minneapolis is often referred to as a "buyers" market, since over half of the



wheat arriving at that market is estimated to be used by the local mills. These interests wish to obtain a severe inspection and this pressure counterbalances the effort of the producers and shippers to secure liberal inspection. At Duluth the grain is bought by exporters. They, of course, do not want over-grading, but as long as the inspection out of the market is the same as that upon grain arriving, there is no concerted action to raise the standard. Thus there is a natural tendency for inspection to be more severe at Minneapolis.

In order to overcome this difference, the state inspection department has resorted to various means. The chief inspector visits the two cities frequently and samples of grain are exchanged between the two. Then the Boards of Grain Appeals exchange members for a few days each month and during the first movement of a new crop they exchange visits every few days. The impression prevails among grain men that the difference in inspection has not been wholly removed, that there are still occasional seasons when Duluth inspection is more liberal. This difference was material prior to the adoption of state inspection and led to negotiations between the two markets to secure a uniform standard.

State inspection has not always been able to keep the standard of grading in the two markets on a par. A wellknown instance serves as an illustration. There was a "squeeze" at Minneapolis a number of years ago and prices were consequently better than at Duluth. An elevator company at Duluth wishing to take advantage of the better prices loaded a train of wheat from its Duluth elevators for Minneapolis destination. Precautions were taken to secure a contract grade so a re-inspection and appeal

was called at Duluth and in each case the grade of No.1 Northern was sustained. Upon arrival at Minneapolis, the grain was graded No.1, was re-inspected and sustained, and was appealed and graded No.2 and could not be delivered, except at a  $3\frac{1}{2}$  cent discount. Thus the state had graded it No.1 five times and the sixth time repudiated its former decisions. The matter was called to the attention of the governor, but no action was secured and the elevator company realized a great loss.

This illustrates the difficulty of maintaining the standard of inspection in the two markets on a par. The close co-ordination of the work in the inspection departments would probably make such an instance impossible at the present time. The inspection standards of the two markets will tend to be unlike as long as they include their present trade interests, but by close supervision in the inspection department, this difference may be reduced to a minimum.

Every inspection is subjected more or less to the influence of conflicting trade interests. Commission merchants and elevator companies when loading out of store desire liberal inspection, or a low standard of inspection, whereas the buyers wish a severe inspection. There is divided opinion, depending upon the interest concerned, as to the effect of these various factors upon Minnesota inspection. The producers believe that inspection, especially at Minneapolis, is made too severe because of pressure brought to bear by the buyers, particularly the flour mills. The buyers, on the other hand, maintain that the predominance of the agricultural vote and influence in state politics, makes inspection easy, as is evidenced by the policy of the state inspection department to grade

liberally, i. e., where there is a question as to whether wheat should grade No. 2 or No. 3, it is given the benefit of the doubt and graded No. 2.

Both the buying and selling interests are so powerful in Minnesota that the inspection must and does consider the requests of each; out of justice to the grain industry of the state it can ignore neither. Special effort has been made, however, at different times to have the grades changed. In 1907<sup>(1)</sup>, the wheat in the Northwest was frosted over large areas. The Boards of Grain Appeals allowed the frosted grain, in limited quantities, in the "grade wheat". The millers objected to this but the boards would not change the standard. Thereupon the Northwestern Miller, an organ of the millers, took the matter to Governor Johnson and a hearing was held in his office November 12, 1907. After investigation, the boards were convinced that their position was fair and the standard for wheat remained unchanged. Another instance is the velvet chaff wheat controversy which has already been explained, and which was initiated by the producers of the Northwest, whose requests regarding this variety of wheat was finally granted.

The very nature of inspection is such that it is extremely difficult to determine whether or not one trade interest affects the state inspection more than any other interest. This much appears certain, if one interest is predominant, it must have an appreciable effect upon inspection. If the buying interest predominates, its repeated suggestions and calls for lower grades will unconsciously beat the grades down, no matter how honest or fair-minded an inspector may be or how much he may desire to maintain a uniform standard of inspection.

(1) Minnesota Legislative Grain Hearings, 1913, p. 10 F.

## C. - Re-Inspections and Appeals.

We have already discussed the trade factors and the possibility of their affecting inspection. It has been suggested that data on original inspection to prove its fairness or unfairness is unavailable, but we have every reason for confidence in the integrity of the inspection department, since its officials are chosen for their probity and ability, the inspectors are given definite rules for inspection, they do not know the ownership of the grain, and no one is allowed near an inspector while he is working. If there is any partiality, it is not intentional, but is due to trade conditions, which make it possible for one interest to continually call for re-inspections and appeals, and by repeated suggestions, beat the standard up or down. The only way to study these influences is to analyze the re-inspection and appeals, of which we can secure considerable information from the state inspection department and the annual reports of the chief inspector of grain to the Railroad and Warehouse Commission.

(1)

Table IV.

## RE-INSPECTIONS IN MINNESOTA.

Year.	Per cent of cars re-inspected.	Per cent of cases of re-inspections in which original inspections were-	
		Changed.	Sustained.
1910-11	23.4	43.5	56.5
1911-12	27.4	43.6	56.4
1912-13	35.4	34.4	65.6
1913-14	16.5	22.3	77.7
1914-15	11.3	18.0	82.0

(1) Annual Reports of the Chief Inspector of Grain to the Minnesota Railroad and Warehouse Commission, 1911 to 1915 inclusive.

Table IV - Continued.

Year.	Per cent of cases in which grades were-		Per cent of cases in which dockages were changed.
	Raised.	Lowered.	
1910-11	24.3	6.8	12.0
1911-12	28.7	4.6	10.4
1912-13	20.5	5.8	8.2
1913-14	8.2	4.4	9.6
1914-15	9.1	2.9	5.8

The above table gives an idea of the per cent of original inspections that are re-inspected and of their disposition for the past five years. The high per cent of re-inspection for the first three years should be noted; in the case of one-fourth of the inspections, re-inspection was demanded and in approximately only three-fifths of them were the original inspections sustained. However, there is a marked decrease in the per cent of re-inspections for the last two years, which is attributed to the change in the re-sampling rule. Formerly, a new sample could be called free of charge, but in 1913, this was changed so that new samples can be secured only when evidence is submitted that the original sample is incorrect. This materially lowers the number of re-inspections. It should be noted that the per cent of grades and dockages changed on re-inspection has materially decreased, which is the more significant since it accompanies a decrease in the per cent of re-inspections. This suggests a closer coordination in the department and more scientific methods, such as better equipment and the flour laboratory. This tendency is very important and should be highly commended, since the more scientific the original inspection

and the lower the per cent of grades changed on re-inspection, the less is the confusion and delay in marketing the crop. Besides, the inspection system commands greater confidence from the grain trade when original grades are reliable and thus more nearly meets its purpose.

The per cent of grades raised is much greater than that of grades lowered. Approximately four grades are raised to one lowered. Although the per cent of re-inspections resulting in changes has fallen, there is a decrease both in the per cent of grades raised and the per cent lowered, but the per cent of grades raised is decreasing more rapidly than the per cent of grades lowered. This suggests that the correlation is due to a policy of the department and is undoubtedly the result of the rule to "give the grain the benefit of a doubt in the grade".

(1)

Table V. APPEALS IN MINNESOTA.

Year.	Per cent of re-inspec- tions appealed.	Per cent of cases in which on appeal re-inspections were-	
		Changed.	Sustained.
1910-11	66.5	22.4	77.6
1911-12	65.4	21.2	78.8
1912-13	74.8	22.3	77.7
1913-14	73.5	17.7	82.3
1914-15	77.0	14.5	84.5

(1) Annual Reports of the Chief Inspector of Grain to the Minnesota Railroad and Warehouse Commission, 1910 to 1915, inclusive.



Table V - Continued.

Year.	Per cent of cases in which-		
	Grades were raised.	Grades were lowered.	Dockages were changed.
1911-12	15.8	2.7	3.0
1912-13	18.1	1.6	3.1
1913-14	13.8	.97	3.1
1914-15	9.9	1.65	2.9

This table shows a very high and increasing per cent of re-inspections that are submitted to the Boards of Grain Appeals. In fact, the greater part of the re-inspections in which the original inspections are sustained are appealed. This accounts for the increasing number of appeals, for, as seen in Table IV, the per cent of grades sustained on re-inspection is increasing which means that a larger per cent of grain men who called for re-inspection are dissatisfied and call for appeal.

The per cent of changes on appeal is lower than the per cent of changes on re-inspection, but it is still high. The per cent of changes on appeals has also decreased, particularly during the past two years, due to the change in the sampling rule. The decrease, however, includes a decrease in the per cent of the grades both raised and lowered, since the per cent of dockage changed remains the same. As in the case of the re-inspections, we find a marked excess in the per cent of grades raised over the per cent of grades lowered, in fact the excess is even greater.

This shows that the policy of the Boards of Grain Appeals is more liberal than that of the inspection department, which gives

some justification for the criticism that those boards, through political preferment, are amenable to the will of the producers. There is always the possibility of a difference of opinion, even among experts as to the grade of a grain, so that there must necessarily be some grades changed upon re-inspection and appeals, but to have such a large per cent changed on re-inspection and appeal and so many more raised than lowered indicates that the original inspection is either poor or too severe, according to the standards of the Boards of Grain Appeal. It may be attributed partly to carelessness in the original inspection, but the data would lead us to believe that it is due primarily to the policy of the Boards of Grain Appeals. Guarded as the inspectors are from outside influence, the original inspection is probably fair; the inspectors are instructed, in case there is some question as to whether grain should grade one of two grades, to allow the grain the benefit of the doubt and give it the higher grade, but they apparently do not grade liberally enough for the Boards of Grain Appeals.

(1)

Table VI. - RE-INSPECTIONS AND APPEALS IN MINNESOTA.

Per cent of total original inspections in which-

	Original inspections changed.	Grades raised.	Grades lowered.	Dockages changed.	Not re-inspected or sustained.
1911-12	15.8	10.7	1.7	3.4	84.2
1912-13	13.1	8.7	1.8	2.6	86.9
1913-14	5.8	3.25	.8	1.95	94.2
1914-15	3.3	1.9	.48	.92	96.7

(1) Annual Report of the Chief Inspector of Grain to the Railroad and Warehouse Commission, 1911 to 1915 inclusive.

Table VI is a summary of re-inspections and appeals on the basis of the total amount of grain inspected. The most striking feature is the gradual decrease in the per cent of changes in grades and dockage. It is true that the per cent of grain changed on re-inspection and appeal varies with the character of the crop, a crop of uniformly good quality and light dockage having a small per cent of changes, but the character of the crops do not warrant the assumption that the decrease is entirely due to crops of a better quality; it is due to a change in the policy of the state inspection.

It is interesting to compare the re-inspection and appeals at Minneapolis and Duluth. Contrary to the opinion of many grain men, the following table (VII) shows that the per cent of original inspections re-inspected is slightly greater at Duluth than at Minneapolis for a five year period. The per cent of grades raised and lowered is larger at Minneapolis than at Duluth for the period studied, but the number of dockages changed is smaller, the per cent of re-inspections in which the original inspections were sustained being 66.4 at Minneapolis, and 72.6 per cent at Duluth. The per cent of grades raised and lowered at Minneapolis for 1913-14 is worthy of consideration; the number of grades raised decreased from 23.6 per cent in 1912-13 to 6.9 per cent in 1913-14, the decline being partly due to a crop of particularly good quality.

Table VII - COMPARISON OF RE-INSPECTIONS AT MINNEAPOLIS AND DULUTH. (1).

Year.	Per cent of original inspections re-inspected.		Per cent of re-inspections in which grades were-			
	Mpls.	Duluth.	Raised		Lowered	
	Mpls.	Duluth.	Mpls.	Duluth.	Mpls.	Duluth.
1910-11	23.5	20.1	26.5	12.9	7.6	1.6
1911-12	28.2	26.9	32.0	14.9	5.0	3.0
1912-13	26.3	25.6	23.6	13.7	6.3	4.6
1913-14	15.0	21.9	6.9	10.7	4.8	3.7
1914-15	10.2	14.3	10.2	7.1	3.9	.9
Average	20.6	21.7	19.8	11.8	5.5	2.7

Year.	Per cent of re-inspections in which dockages were-			
	Changed.		Sustained.	
	Mpls.	Duluth.	Mpls.	Duluth.
1910-11	10.0	23.9	55.7	61.4
1911-12	10.0	12.4	52.9	69.5
1912-13	6.4	11.8	63.6	69.4
1913-14	6.6	15.2	81.5	73.2
1914-15	7.3	2.3	78.5	89.5
Average	8.0	13.1	66.4	72.6

(1) Annual Reports of the Chief Inspector of Grain to the Minnesota Railroad and Warehouse Commission, 1911 to 1915 inclusive.

Table VIII - COMPARISON OF APPEALS AT MINNEAPOLIS AND DULUTH.

Year.	Per cent of re-inspec- tions appealed-		Per cent of cases in which grades were-			
	Minneapolis	Duluth.	Raised.		Lowered.	
			Mpls.	Duluth	Mpls.	Duluth
1911-12	64.1	70.2	14.0	22.7	3.0	1.6
1912-13	76.2	71.7	16.8	21.2	1.6	1.3
1913-14	75.6	70.1	11.9	18.7	.98	.7
1914-15	71.1	88.5	7.0	14.8	2.00	1.0
Average	71.1	75.1	12.4	19.3	1.7	1.1

Year.	Per cent of cases in which- Dockages changed		Grades and dockages sustained	
	Minneapolis	Duluth	Minneapolis	Duluth
1911-12	2.9	3.4	80.0	72.2
1912-13	2.8	3.6	78.8	73.5
1913-14	2.6	3.4	84.8	77.1
1914-15	4.0	1.1	86.9	82.9
Average	3.1	2.9	82.6	76.4

Table VIII shows that the per cent of re-inspections appealed is greater at Duluth than at Minneapolis for a four year average. (The crop year 1910-1911 is omitted because of inadequate data) However, this is due to the unusually large per cent of re-inspections at Duluth for 1914-15, which raises the four year average. The grain tributary to Duluth that season was damaged by rust and drought, and as it was unusually poor a large number of re-inspections was called. The same grain was also uniformly

(1) Annual Reports of the Chief Inspector of Grain to the Minnesota Railroad and Warehouse Commission, 1911 to 1915 inclusive.

clean and free from dirt, causing a small per cent of dockage changes.

It should be noted that the per cent of grades raised on appeal at Duluth is greater than at Minneapolis, but that the grades lowered and dockages changed are less, making the per cent of grades and dockages sustained on appeal at Minneapolis 83.6, at Duluth 76.4. This suggests that the Duluth Board of Grain Appeal is more lenient than the Board at Minneapolis, whereas Table VII suggests that the Duluth inspection department is more severe than that at Minneapolis.

The following table which gives a summary of re-inspection and appeal in the two markets brings out a close relation between the two departments.

Table IX.- COMPARISON OF RE-INSPECTIONS AND APPEALS AT MINNEAPOLIS AND DULUTH. (1)

Year.	Per cent of re-inspections in which, either on re-inspection or on appeal grades were -			
	Raised.		Lowered.	
	Minneapolis	Duluth.	Minneapolis	Duluth.
1911-12	41.0	30.5	6.9	4.1
1912-13	36.3	29.0	7.6	5.6
1913-14	15.6	23.2	4.9	4.2
1914-15	14.7	20.2	5.3	1.9
Average	26.4	25.7	6.1	3.9

Year	Per cent of re-inspections in which, either on re-inspection or on appeal- Dockages were changed.		Original inspections and dockages sustained.	
	Minneapolis	Duluth	Minneapolis	Duluth
1911-12	11.9	14.9	40.2	50.5
1912-13	8.6	14.8	47.5	50.6
1913-14	8.7	17.7	70.8	54.9
1914-15	10.2	3.36	69.8	74.5
Average	9.8	12.7	57.0	57.6

(1) Annual Reports of the Chief Inspector of Grain to the Minnesota Railroad and Warehouses Commission, 1911 to 1912 inclusive.



The per cent of grades raised upon re-inspection and appeal is .7 of one per cent greater at Minneapolis than at Duluth, grades lowered 2.2 more, and dockage changed 2.9 less, leaving grades and dockages sustained at Minneapolis 57 per cent, at Duluth 57.6 per cent. The Boards of Grain Appeals determine the standard of inspection since the grade which they give a grade is final, so that, from Table VIII, which shows that the Board of Grain Appeals at Duluth is more lenient than the Board at Minneapolis, one might conclude that inspection is more lenient at Duluth. If the per cent of dockages raised and lowered in the two markets were available, more light might be shed on the subject. However, the data presented in Tables VII, VIII, and IX would lead us to believe that their inspection standards are on a par; that while they may vary with changing conditions, nevertheless over a considerable period of time they are almost identical.

The Minnesota inspection has been subjected to much criticism in regard to inspection "in", upon grain arriving, and inspection "out", upon grain shipped out of store. This was the chief topic for controversy in that part of the Minnesota Legislative Grain Investigation of 1913, pertaining to inspection but no results were secured. Most of the grain that is shipped out of Duluth and Minneapolis goes through an elevator and is there mixed with other grain, thus losing its identity so that it is impossible to secure any data upon which to draw definite conclusions. A small quantity of grain passes through the elevators without losing its identity, being merely transferred from one railroad to another. This is inspected "in" and "out" and does not always grade the same on both inspections, owing to a difference in the judgment of the

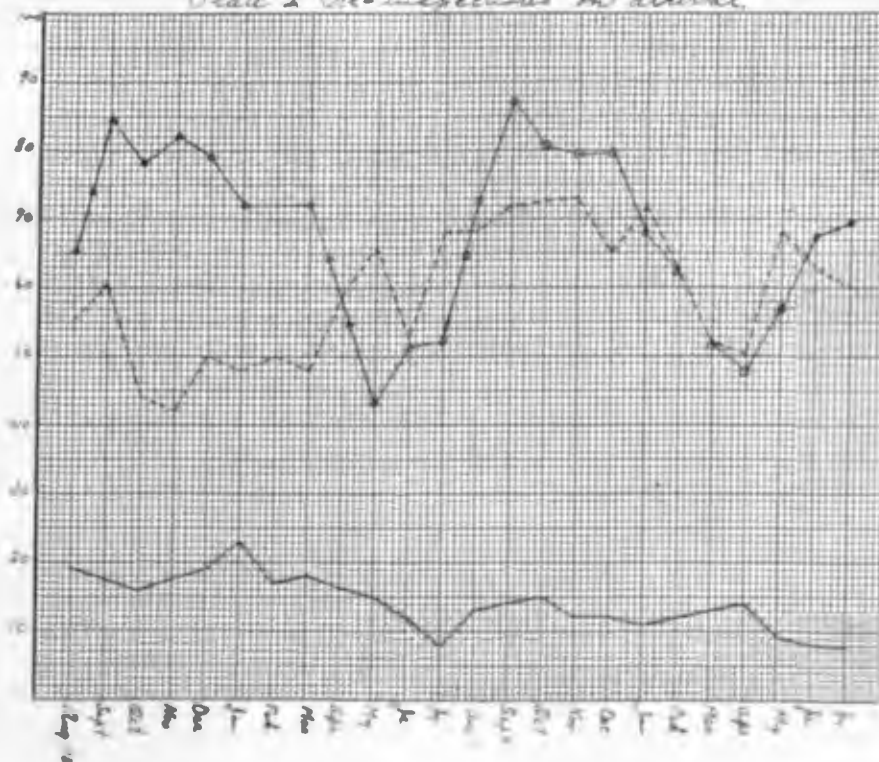
of the two inspectors or to a change in condition because of handling. However, the inspection department aims to keep them the same and if they are not, will change the "out" inspection to agree with the "in" inspection if possible, or if their attention is called to the discrepancy within a reasonable time.

Since it is impossible to secure data on original "in" and "out" inspection, we shall have to content ourselves with an analysis of re-inspections and appeals. One must bear in mind the different trade interests that may influence inspection. There are first those who are consigning to the market and who are calling for higher grades, second, those who are shipping out of the market and wish good grades, and third, those who buy and call for lower grades, (in this study grades and dockages are grouped together, lower dockage, which in effect is <sup>a</sup> higher grade, is grouped with grades raised, and dockages raised are grouped with grades lowered). Now, it must also be remembered that these influences are always present, there is grain received at and shipped from the market every day, but the quantity arriving and the amount moving out of the market do not always bear the same relation to each other.

Therefore, as a basis for our analysis, we must consider first, the relation of inspection "in" and inspection "out" to the total amount inspected, second, the per cent of grades raised or lowered to the total amount changed on re-inspection and appeal, and third, the per cent of grain "in" and "out" that is re-inspected and appealed.

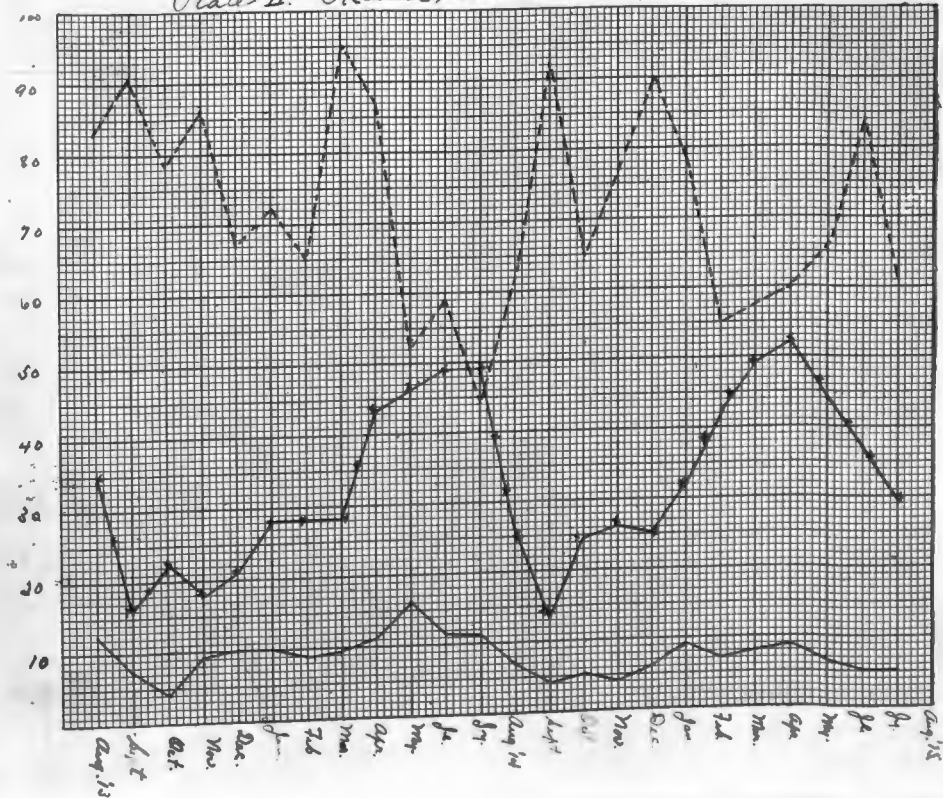
Plate I shows these figures graphically for re-inspections "upon arrival". If there is any partiality in inspection or if one of the trade interests has more influence upon inspection than the

*Plate I Re-inspections on arrival*



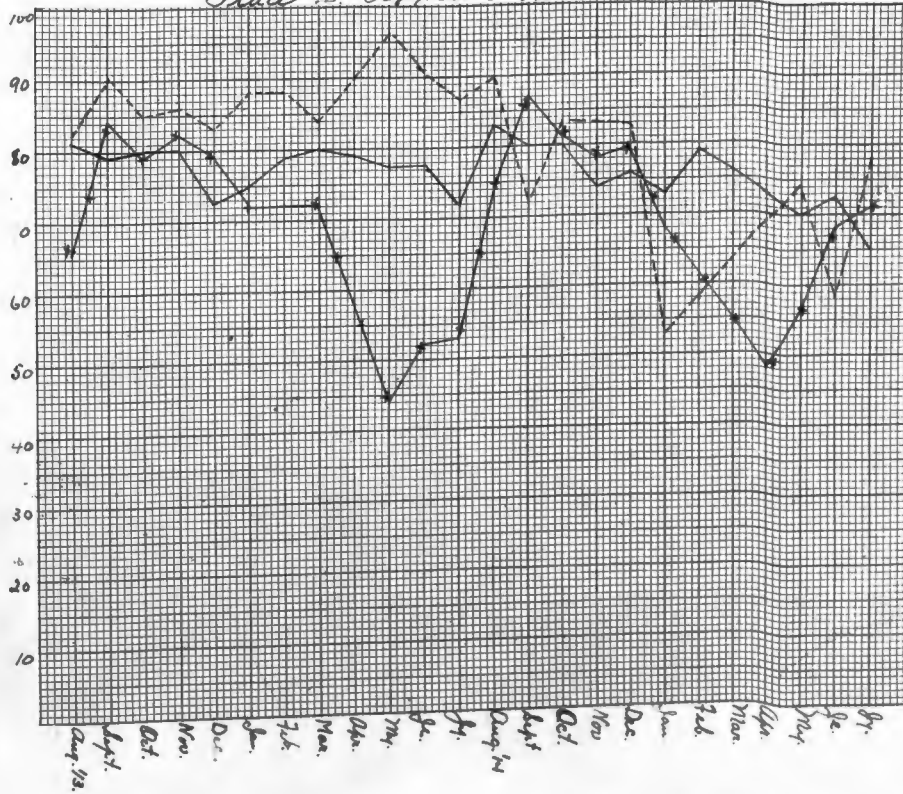
- Per cent of grain reinspected "upon arrival".
- - - - - Per cent which grades raised forced of total grades changed on reinspection.
- — ● — ● — ● Per cent of "in inspections" forced of total inspections.

Plate II. Reinspections "out of store"



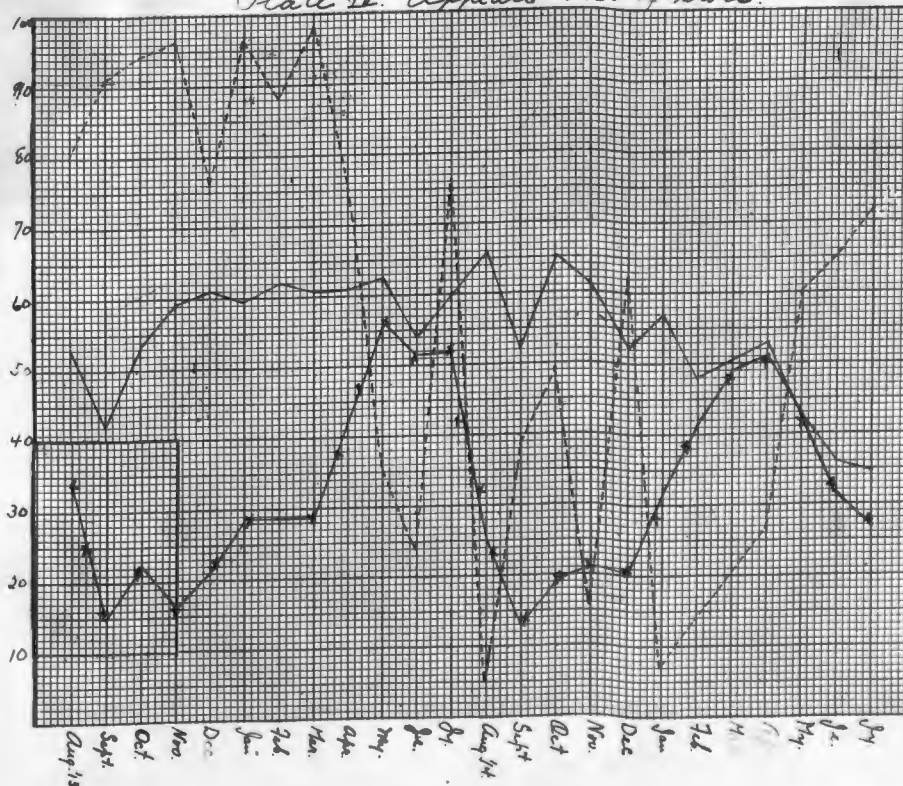
- Per cent of grain reinspected "out of store".
- Per cent which grades raised formed of total grades changed on reinspection.
- \*-\*-\*-\* Per cent of "out inspections" formed of total inspections.

Plate II. Appeals on arrival.



- Per cent of reinspections appealed.
- Per cent which grades raised formed of total grades raised on appeal.
- x—x—x— Per cent of "in inspections" formed of total inspections.

Plate IV. Appeals "out of store".



- Per cent of reinspections appealed.
- Per cent which grades raised formed of total grades changed upon appeal.
- ◆◆◆◆◆ Per cent of "out inspections" formed of total inspections.



others, we would expect the influence to be most prominent at that season when the relative importance of that trade interest is greatest. For example, in the autumn the receipts represent a larger per cent of the total grain inspected than at any other season; the shippers or commission men are calling for re-inspection to raise the grade of their grain. Now, if their constant calling for higher grades has any effect to beat the grade standards down or there is any partiality in grading, it should be evident in the fall when the crop movement is heavy.

On the other hand, if the elevators are more, or less persistent in calling for higher grades on "out" shipments than the country shippers, their influence should be conspicuous in the spring and summer when their shipments represent a larger per cent of the total amount of grain inspected than during the fall and winter. For the year 1913-14, the relation of the grades raised to the volume of receipts is inverse, the per cent of grades raised being lowest in the autumn when the crop movement is heaviest and gradually increasing as the receipts of grain decline. For the following year, however, the relation is direct; there is a close parallelism between the receipts and the per cent of grades raised upon re-inspection.

Plate II, illustrating the influences effecting "out" inspection, shows even less correlation between shipments and lenient inspection. In fact, the period when the most grades on grain shipped are raised upon re-inspection is during the autumn and winter months when receipts are greater than shipments, while during the summer months when they are about equal, including the "delivery" months of May and July, the per cent of grades raised

is the lowest. It is difficult to explain this phenomenon, but certainly there is no relation between shipments and the standard of inspection.

An analysis of the appeals "in" and "out", Plates III and IV, give similar results. The curve on Plate IV, representing the per cent of grades raised or lowered on appeals "out" shows extreme variations for the crop year 1914-15. This is due chiefly to changes in the official dockage given by the inspection department. There appears to be no relation between the volume of receipts and shipment and the per cent of grades raised and lowered. If these different factors have any influence upon inspection, as alleged, it must be only temporary and in special cases for the condition is not constant enough to be detected in a statistical study of re-inspection and appeals.

There seems to be no relation between the per cent of grain re-inspected and appealed and the per cent of grades raised and lowered. However, it is interesting to note the distribution of re-inspections on "in" and "out" grain. Plate I shows that large receipts are accompanied by a high per cent of re-inspection, that the highest per cent is in the autumn and that it gradually decreases with a decline in receipts until the movement of the new crop. Plate II shows a similar relation for "out" inspection, except that the shipments are heaviest in the spring and summer months. In the case of "in" inspection, this may be partly explained by the fact that the trade and inspection department have not become adapted to the new crop conditions and hence more re-inspections are called than later in the year. On the other hand, when

the movement is heavy either "in" or "out" it is natural for a large per cent of re-inspections to be called.

Table X. - COMPARISON OF RE-INSPECTIONS AT MINNEAPOLIS AND CHICAGO. (1) (2)

Year.	Per cent of cars re-inspected.		Per cent of re-inspections in which original inspections were-			
	Mpls.	Chicago	Changed.		Sustained.	
	Mpls.	Chicago	Mpls.	Chicago	Mpls.	Chicago
1911-12	28.2	2.12	47.1	45.3	52.9	54.7
1912-13	26.3	1.08	36.4	43.0	63.6	57.0
1913-14	15.0	1.05	18.5	30.2	81.5	69.8

The above table indicates how re-inspections may vary under different supervision. At Chicago the per cent of re-inspections is remarkably lower than at Minneapolis, although the per cent of re-inspections changed compares very closely, excepting in 1913-14 when it is considerably higher than at Minneapolis. Yet, when we consider the per cent of total inspections changed in the two markets, Chicago compares much more favorably with Minneapolis since the per cent at Chicago is much lower than at Minneapolis.

This phenomenon is often explained on the ground that Minneapolis is a buyers' market and that since the shippers' representatives and the buyers are both in the market, each may call for re-inspections and thus make a larger per cent than in a market such as Chicago, where most of the grain is taken by elevators who are not so particular about the grade as long as the grain inspects "out" the same as "in". However, in the comparison of Minneapolis and Duluth re-inspections, Table VI, we saw that the per cent of

(1) Annual Reports of the Chief Inspector of Grain to the Minnesota Railroad and Warehouse Commission, 1912 to 1914.

(2) Annual Report of the Illinois State Grain Inspection Department, 1912 to 1914.

re-inspections is as large at Duluth as at Minneapolis, and elevators buy most of the grain at Duluth for export as at Chicago. There must be other factors; possibly custom plays its part, and no doubt it is partly attributable to differences in methods and organization.

Table XI.- COMPARISON OF SURVEYS AT WINNIPEG AND APPEALS AT MINNEAPOLIS. (1)  
(2)

Year.	Per cent of original inspections-		Per cent of re-inspections	
	Surveyed	Appealed	changed on-Survey	Appeal.
1911-12	.38	17.2	24.8	17.1
1912-13	.13	16.5	15.1	34.0
1913-14	.08	11.4	18.1	18.8

The per cent of appeals, like re-inspections, vary with different inspection systems. For example, the per cent of grades changed on surveys at Winnipeg, which corresponds to appeals in Minnesota, compares very closely with the per cent of appeals changed at Minneapolis. However, the per cent of inspection surveyed is insignificant in comparison with the appeals at Minneapolis, so that the disposition of appeals at Minneapolis is of greater consequence to the grain trade than the surveys at Winnipeg. This difference is due to two causes. First, the marketing systems are different. Grain is sold primarily by grade at Winnipeg; the railroads do not have facilities to hold the grain long enough for re-inspection and surveys so the consignee does

- (1) Report of the Department of Trade and Commerce, Part V - Grain Statistics, Dominion of Canada, for the crop years 1911-12, 1912-13, 1913-14.  
(2) The Annual Report of the Chief Inspector of Grain to the Minnesota Railroad and Warehouse Commission for the crop years 1911-12, 1912-13, 1913-14.

not secure a sample of the grain to display on the trading floor, as is done in Minneapolis; consequently, he is in no position to know whether the grain could stand re-inspection and survey.

The difference in the number of surveys and appeals is also the result of the policy of the Dominion Government to maintain severe inspection; if there is a question as to whether grain should grade No. 2 or No. 3, it is graded No. 3 in order to maintain a high standard of inspection to attract foreign buyers, so the possibility of getting the grade raised upon survey is more doubtful than at Minneapolis where inspection is liberal. Then again, the survey fee is three dollars whereas the cost of an appeal is only one dollar if the original grade is sustained, and is free if the grade is changed. This obviously places a greater premium upon appeals than surveys. The Canadian method of marketing grain and the organization of the inspection department are suited to the buying interests; they tend to discourage the purpose of surveys, which is to allow errors on the original inspection to be corrected and thus work a hardship upon the shipper and producer. Minnesota and Canadian inspection represent the two extremes in this regard; Canada discourages the free operation of surveys, <sup>and</sup> in Minnesota appeals are secured so easily that it encourages a large number, resulting in many changes which make the grades less certain, and hence of less value to the grain trade.

The analysis of re-inspection and appeals failed to show any relation between the movement of grain and the policy of inspection, thus tending to show that there is no change in the standard due to any trade interest. However, there are certain facts which appear to the casual reader, to controvert this conclusion.

The fact that the terminal elevators ship more wheat of the good grades than they have put into store is given by some critics as conclusive proof of unfair inspection.

Table XII.- RECEIPTS AND SHIPMENTS AT CONCRETE ELEVATOR (1)  
Aug. 31, 1910 to Aug. 31, 1912.

Grade.	Receipts.	Shipments.	Receipts over shipments.	Shipments over receipts.
No. 1 Hard	23,878	2,774	21,087	
No. 1 Nor.	656,202	1,012,831		356,629
No. 2 Nor.	875,345	1,211,503		333,156
No. 3 Nor.	325,653	86,431	235,222	
No. 4 Nor.	105,844	6,825	99,019	
Rejected	32,001	13,393	18,608	
No Grade	338,403	32,475	305,928	

This elevator, which is typical of the terminal elevators of Minneapolis and Duluth, shipped over a quarter of a million bushels of No. 1 and No. 2 Northern wheat more than it received, whereas the shipments of No. 1 Hard and the poorest grades were less than the receipts. To some people these facts indict the inspection department for discrimination in favor of the elevator., but it is the result of the legitimate practice of mixing grain. For example, a merchant who does not deal intensively in grain buys two cars of choice No. 2 Northern and one car of No. 3 Northern. Now, by mixing those three cars of wheat, he can secure three cars of No. 2 Northern, because the wheat of the third car was not poor enough to lower the quality of the other two so that they would meet only the No. 3 requirements.

(1) Minnesota Legislative Grain Investigation, 1913, pp. 3-5.



The same condition holds true for an elevator. The law allows mixing so the elevators employ an expert grain mixer who mixes the various wheats in such a way as to meet the minimum requirements of the desired grade. The grain will naturally be on the lower margin of the grade, but so long as it falls within the limits of the established grade, it is incumbent upon the inspector to give it the grade to which it is entitled irrespective of whether it is mixed in a terminal elevator or in the producer's granary. Thus, the mere fact that more or less grain of a given grade is received into an elevator than is taken out does not necessarily reflect upon the integrity of the inspection department.

## D.- Cost of Inspection.

(1)

Inspection Fees of Minnesota Terminals for 1915-16.

"Twenty-five cents per carload for inspection 'on arrival' and 'out of store', on wheat, oats, barley, and speltz.

"Twenty-five cents per thousand bushels for inspection of cargoes into vessels and belt transfers on wheat, oats, rye, barley, and speltz.

"Seventy-five cents per carload or part carload for inspection 'on arrival' and 'out of store' on flaxseed and corn.

"Seventy-five cents per thousand bushels for inspection on cargoes into vessels or for belt transfers on flaxseed and corn."

Inspection fees for state inspection outside of the Minnesota terminals is fifty cents per carload "on arrival" and "out of store".  
(1)

The cost of a public service is sometimes more than commensurate with its importance and utility, but this is not true of the cost of inspection; the inspection fees are nominal in all markets. The purpose of the inspection fee is not to secure revenue but to maintain the department. The law provides that the Railroad and Warehouse Commission shall establish such inspection fees from time to time as shall be necessary to meet the expense of the service. The fees, therefore, vary from season to season according to the volume of the crop movement; if a surplus is accumulated one season, the fee is lowered for the following year, or if a deficit is incurred the fee may be raised. The only financial assistance which the department has received is one

(1) 30th Annual Report of the Chief Inspector of Grain to the Minnesota Railroad and Warehouse Commission, 1916, p.16.

thousand dollars that the legislature appropriated as an establishment fund. Aside from this the service has been self-sustaining and has accumulated a revolving fund.

The state furnishes inspection to any point outside the terminals of St. Paul, Minneapolis, and Duluth, which will guarantee the cost of the service. The fees at such points are fifty cents which is higher than at the terminals because of the smaller volume of grain. The six following points have taken advantage of this provision and now have state inspection;—<sup>(1)</sup> New Prague, New Ulm, Sleepy Eye, St. Cloud, Winona, and La Crosse, Wisconsin. Samples are sent from these markets to Minneapolis or Duluth for re-inspection and appeal.

Table XIII.— INSPECTION FEES.

Year.	Minneapolis.	Chicago.	Kansas City.	Canada.
1911-13	\$.35	\$.50	\$.50	\$.50
1912-13	.15	.35	.50	.50
1913-14	.15	.35		.50
1914-15	.35	.50	.50	.50
1915-16	.25	.50		.50

The inspection is furnished for the Minnesota markets more cheaply than for any of their competing markets and the service is as efficient. The Canadian fees are determined by law so they do not vary; at Kansas City they are established by the Missouri Railroad and Warehouse Commission; likewise in Illinois they are fixed by the State Railroad and Warehouse Commission. The fee was reduced to thirty-five cents at Chicago in 1912, but as it was

(1) 30th Annual Report of the Chief Inspector of Grain to the Minnesota Railroad and Warehouse Commission, 1916, p. 6.

inadequate to support the inspection department, it was again raised to fifty cents.

The cost of Minnesota inspection to the producers is <sup>(1)</sup> \$.000396 per bushel, or expressed in clearer terms, it costs one-third of one-tenth of one cent per bushel. When we consider the service which the shipper receives, the grain graded, the condition of cars determined and reported, we must admit that the cost of this important aspect of grain marketing is very reasonable and is a burden to neither the producer nor the grain trade.

(1) 30th Annual Report of the Chief Inspector of Grain to the Minnesota Railroad and Warehouse Commission, 1916, p.35.

### E. Dockage.

The term "dockage" is used in reference to the foreign material and dirt in grain. It is a common practice in the spring wheat markets of the Northwest to deduct the amount of dirt from the gross weight of the grain. A fifty bushel load of wheat containing three pounds of dirt to the bushel would have one hundred and fifty pounds or two and one-half bushel deducted from the gross weight. This discount from the gross weight for foreign material is also known as "dockage", the term thus having two meanings.

Minnesota inspection provided for dockage when it was organized in 1885, and it had the only dockage system until Chicago inaugurated the practice in 1913 in order to meet the competition of Minneapolis and Duluth. The winter wheat grades are promulgated on a percentage basis; i. e., only a certain per cent of dirt or foreign material is allowed in the higher grades. If there is an admixture of dirt, it lowers the grade, but is not deducted from the gross weight. This method is made possible by the uniform cleanness of winter wheat. The foreign material in spring wheat, however, is heavier owing to the later maturity of the crop and, according to grain men, the spring wheat farmer is not so careful to raise clean grain as is the winter wheat producer.

Whatever the cause may be, the fact remains that a system of dockage for foreign material in spring wheat is more practical than for winter wheat, because of this difference in the amount of dirt. However, there is a certain faction who believe that the percentage system is preferable to the dockage for spring wheat. For example, the dockage on a load of wheat is three pounds per bushel, or five per cent. On the basis of one dollar per bushel

for clean grain, the farmer only receives ninety-five cents per sixty pounds of grain that he markets. If there had been no dockage system, the grade would have been lowered and he might have received ninety-five cents per gross bushel instead of one dollar per net bushel. In either case, he would have received the same amount for the load of grain, but the futility of growing weed seeds would have been impressed upon him if he had received only ninety-five cents per gross bushel because of foreign material. As one advocate of the percentage basis has said, "The system gets back to the cause of the dirt and foreign material".

In certain respects the Minnesota Spring Wheat grades are affected by this foreign material. Where it is of such a nature or in such quantities, as to depreciate the value of the grain for milling purposes, the grain is given a lower grade. This is true for admixtures of thin barley and rye, for smut, weed seeds such as cockle, kingheads and hairy vetch, which injure the flour when present in small quantities. This policy is necessary if the wheat grades are to bear any relation to the commercial value of the grain. However, in the case of separable impurities, which the mills and elevators have machinery to remove, the practice is not so essential. In fact, there is some question as to whether dockage is not the best way to handle such foreign material. In the first place, it makes <sup>it</sup> possible to classify more grain as the best grades. When the amount of foreign material is prevailingly heavy as in the present crop, there would be little "contract grade" grain unless provision were made to permit a high per cent of foreign material under such conditions. This would impair "future" trading and possibly inconvenience the grain trade. Besides, when grain is classed in



the poor grades, even though it would have been graded No.1 Northern with a dockage system, it is placed upon a merchandising basis, i. e. there is no recognized market price for such grain, as in the case of No.1 Northern, and the price which it brings depends more largely upon the ability of the commission men to sell it. There is less demand for such grain, even though it might have secured a higher grade with a dockage system, and thus the producer and shipper is placed at a disadvantage.

This point is well illustrated in the case of barley upon which there is no dockage. Malting barley must be fairly clean to grade as such, but since the producers sow barley upon foul land in order to eradicate the weeds, it has heavy dirt and foreign material. As a result, most of the barley is graded as feed, although it may easily be cleaned and the quality of the barley itself may be excellent for malting purposes. This places it upon a merchandising basis, and the price which it brings depends largely upon its sale by sample. However, it does not make as much difference with barley as with wheat, since the trade pays little attention to the barley inspection certificates.

In the absence of a dockage system, the percentage of dirt and foreign grain that may be allowed in the grades, particularly the higher grades, should be definitely determined in order to discourage the practice of mixing grains. It has been a common practice to mix wheat screenings into grains whose grades have no percentage basis, particularly into oats, since they are usually free from dirt and will carry a considerable amount of screenings without detection and penalty. It was to stop this practice that Minnesota oat grades were put on a percentage basis August, 1915,

and they appear to have had fair success in the short time they have been used.

Another pernicious practice is mixing different kinds of grains, particularly oats and barley. J.W.T. Duvel, Bureau of Plant Industry, Department of Agriculture, addressing the Millers' Annual Mass Convention at Toledo in June, 1915, said, <sup>(1)</sup> "During the past year the flagrant abuse has been made of mixing barley with oats and selling as oats because the price of oats was high. The admixture of barley was as high as twenty per cent."

"The practice became so serious that the Bureau of Chemistry, under the Food and Drugs Act, instituted several seizure actions, and the Department of Agriculture issued a warning to the grain trade, through the newspapers, under date of Jan. 25, 1915, that the practice of adulterating oats with barley must cease. Government investigations likewise showed that when spring wheat was cheaper than durum, or hard wheat was cheaper than soft wheat, heavy mixtures of the cheaper class of wheat were found in the shipment of the higher priced wheats". <sup>(2)</sup> Such mixtures have no justification and should receive severe treatment from the inspection departments. They supply a mixture for which there is poor demand and its value is reflected back upon the prices of unadulterated grain.

The common foreign materials usually have commercial value ranging from a few dollars per ton to thirty and forty cents per bushel for wild oats, depending upon the feeding value of the separations. This raises the question as to whether the producer receives the value of the foreign matter and how it affects the

(1) Weekly Northwestern Miller, June 9, 1915.

(2) Weekly Northwestern Miller, Aug. 10, 1915.

price of his grain.

An interesting instance of a North Dakota producer follows. In 1915, this farmer threshed 1,596 bushels of wheat according to machine measure. The grain was infected with wild oats and consequently it would not weigh out to machine measure. The local elevator offered to allow 1,400 bushels with twenty-two pounds dockage per bushel; this left only 890 bushels of saleable wheat and, at the local price of eighty-five cents, the grain would bring \$750.50. Being dissatisfied with the results, the producer shipped the grain to Minneapolis where it went to a terminal elevator and was cleaned before being offered for sale. The car contents were reported 1,067 bushels of wheat, 531 bushels of wild oats, and 1,068 pounds of screenings. A commission firm sold the wheat for ninety-three and three-eighths cents, the wild oats for twenty-three cents per bushel, and the screenings at ten dollars per ton, making a total of \$1,122.14. After deducting freight, commission, cleaning and other charges, there was a net balance of \$974.00.

Obviously it paid this producer to clean his grain; he received \$223.50 over what he would have received at the local elevator. The facts suggest poor market conditions at the country elevator, but let us analyze the case at hand. This incident occurred at the beginning of the crop movement; wild oats were prevalent over the Northwest and the markets were flooded with grain containing them; the local elevator operator was not sure what disposition could be made of the grain at Minneapolis or Duluth and could not afford to run any risks. So to be safe, he over-docked the grain and offered a price which would allow him a

good margin for risk involved. Reflection should not, therefore, necessarily be cast upon the local elevator for the prices which it offered, and the producer who grows and offers such grain for sale should not be surprised or disappointed if he is offered low prices.

The unusually heavy dockage in the crop of 1915 has caused much discussion of that subject and evoked a diversity of opinion as to a remedy. One aspect of the problem that is of special importance to the producer is the effect of foreign material upon the market value of grain. In order to secure definite information upon the subject the following study was made by C. H. Bailey, Crop Technicnologist, College of Agriculture, University of Minnesota, and the writer.

Several samples of No.2 and No.3 Northern wheat, such as are merchandised in the Minneapolis market, were secured and commercially cleaned. Different kinds of foreign material in different quantities were then added to the clean grain, and the samples were submitted to three expert grain merchants in the Minneapolis Chamber of Commerce, who passed upon the commercial value of the grain. Separations of the foreign materials used were also submitted to merchants who deal in screenings in order to secure the merchandising value of the foreign material.

Table XIV. Table showing the effect of separable dockage upon the market price of wheat.

Grade.	Foreign material (per bu)	Value of wheat per bushel				Value of foreign material.	Loss to shipper allowing 1% for cleaning.
		Merchant A.	Merchant B.	Merchant C.	Average price.		
3 Nor.	0 lb.	\$1.10 7/8	\$1.10 7/8	\$1.10 3/8	\$1.10 6/8	.000	.000
3 "	1 "	1.10 7/8	1.10 7/8	1.10 3/8	1.10 6/8	.006	.000
3 "	3 "	1.10 7/8	1.10 7/8	1.09 3/8	1.10 3/8	.018	.011 $\frac{3}{4}$
3 "	5 "	1.11 3/8	1.11 3/8	1.09 7/8	1.10 7/8	.03	.019
3 "	7 "	1.11 3/8	1.11 7/8	1.10 3/8	1.11 2/8	.042	.027
2 Nor.	0 lb.	1.15 1/8	1.13 3/8	1.13 7/8	1.14 1/8	.000	.000
2 "	1 "	1.14 7/8	1.13 3/8	1.13 7/8	1.14	.006	.000
2 "	3 "	1.14 7/8	1.13 3/8	1.13 7/8	1.14	.018	.00925
2 "	5 "	1.15 3/8	1.14 3/8	1.13 3/8	1.14 3/8	.03	.0175
2 "	7 "	1.15 3/8	1.15 3/8	1.13 7/8	1.14 7/8	.042	.0245
3 Nor.	0 lb.	1.11 3/8	1.11 3/8	1.10 3/8	1.11	.000	.000
3 "	1 "	1.10 7/8	1.11 3/8	1.10 3/8	1.10 7/8	.006	.000
3 "	3 "	1.10 7/8	1.11 7/8	1.10 3/8	1.11	.018	.008
3 "	5 "	1.10 7/8	1.11 3/8	1.10 7/8	1.11	.03	.02
3 "	7 "	1.10 7/8	1.12 3/8	1.11 3/8	1.11 4/8	.042	.027
3 Nor.	0 lb.	1.10 7/8	1.11 7/8	1.10 3/8	1.11	.000	.000
3 "	1 "	1.11 3/8	1.11 3/8	1.10 3/8	1.11	.006	.000
3 "	3 "	1.10 7/8	1.10 7/8	1.10 3/8	1.10 6/8	.018	.01
3 "	5 "	1.11 3/8	1.11 3/8	1.09 3/8	1.10 6/8	.03	.0225
3 "	7 "	1.11 7/8	1.11 7/8	1.11 3/8	1.11 6/8	.042	.0245

Table XIV. (continued)

Grade.	Foreign material (per bu)	Value of wheat per bushel				Value of foreign material	Loss to shipper allowing 1% per bushel.
		Merchant A.	Merchant B.	Merchant C.	Average price.		
3 Nor.	0 lb.	\$1.11 3/8	\$1.10 7/8	\$1.10 3/8	\$1.10 7/8	.000	.000
3 "	1 "	1.11 3/8	1.11 3/8	1.10 3/8	1.11	.006	.000
3 "	3 "	1.11 3/8	1.11 3/8	1.10 3/8	1.11	.018	.00675
3 "	5 "	1.11 3/8	1.11 3/8	1.10 3/8	1.11	.03	.01875
3 "	7 "	1.11 3/8	1.11 7/8	1.10 3/8	1.11 1/8	.042	.03



The five sets of samples whose values are represented in Table XIV were the velvet chaff variety of wheat, and were grown in the East Central part of South Dakota. They were fairly uniform in quality as may be seen from the grades and prices, and represented a good quality of No. 2 and No. 3 Northern Spring wheat. The foreign materials added were a common mixture of forty-seven per cent mustard seed and fifty-three per cent dust and chaff, being worth twelve dollars per ton at the time the values were secured upon the grain.

Contrary to the belief of many people the presence of foreign material may enhance the price of wheat based on the net weight. Shippers in particular state that the dockage is a complete loss, and even men who should be familiar with the wheat market are surprised when informed to the contrary. The prices quoted on the grain in Table XIV shows that the samples containing five and seven pounds of foreign material receive a premium (the price based, of course, on the net weight of the wheat) over the samples with the light dockage or over the sample that is commercially clean. The reason for this is obvious from the data giving "value of foreign material"; five pounds of it is worth three cents which is certainly a commercial consideration with competing buyers.

Heavy dockage, therefore, receives a premium, but the buyer is more or less prejudiced against foreign material in grain; it detracts from the appearance which is an important factor, so that unless the commercial value is attractive, the foreign material may depreciate its value. Besides, the value of the separated material may be less than the cost of cleaning the grain and as it must be cleaned before milling, the grain may actually be worth

less than the commercially clean grain. These reasons explain why the average price for the cleaned grain in four of the five sets of samples in Table XIV is higher than for the grain with the light dockage.

There may be other factors, however, that lower these apparent profits. After grain is commercially cleaned, it sometimes still bears foreign material of one-half or one pound so that instead of realizing five pounds of screenings from grain with five pounds dockage, the buyer may only secure four or four and one-half pounds. There is also difficulty in securing the proper dockage upon inspection, which may not only cause loss in dockage, but also on the value of the grain. These factors may be considered in determining the effect of the dockage upon the price of the wheat, but it is certain that these factors do not entirely offset the large profits indicated in this study.

Table XV. The effect of wild oat dockage upon the price of wheat.

Grade.	Foreign material (per bu)	Value of wheat per bushel				Value of foreign material.	Loss to shipper allowing 2¢ for cleaning.
		Merchant A.	Merchant B.	Merchant C.	Average price		
2 Nor.	9 lb.	\$1.18 1/8	\$1.16 1/8	\$1.18 3/8	\$1.17 4/8	.000	.000
2 "	2 "	1.18 3/8	1.16 1/8	1.17 7/8	1.17 4/8	.006	.000
2 "	1 "	1.18 3/8	1.16 1/8	1.17 1/8	1.17 2/8	.012	.000
2 "	2 "	1.18 3/8	1.16 5/8	1.17 5/8	1.17 4/8	.023	.003
2 "	4 "	1.18 7/8	1.17 1/8	1.18 7/8	1.18 2/8	.047	.019
2 "	6 "	1.19 5/8	1.17 1/8	1.19 5/8	1.18 6/8	.071	.039

The first dockage study was continued with the same type of wheat, but containing wild oats, a common foreign material for the 1915 crop. The wild oats are more valuable than the foreign materials in Table XIV, wild oats being worth thirty-eight cents.

The last column in Table XIV gives the profit on foreign material to the buyers or the loss to the shippers. The value of the foreign material does not represent a clear gain to the buyers, since, as shown in the table, they pay more for the grain with heavy foreign material and it costs about one cent to clean the grain. These factors must, therefore, be considered in determining the shippers' loss. For example, in the first set of samples, the quotation for the grain <sup>that</sup> is commercially cleaned is \$1.10-3/4, and for the sample containing seven pounds of foreign material, \$1.11-1/4, or a difference of one-half cent. Besides, it costs about one cent to clean the grain, so that the buyer apparently makes 4.2 cents, the value of the dockage, minus 1.5 cents or 2.7 cents, per bushel. The profit on the grain with light foreign material is necessarily less, but it shows, however, that the data indicate a handsome profit on grain containing five and seven pounds of foreign material per bushel of thirty-two pounds, when values were received on the grain. However, wild oats are more difficult to separate from wheat than many foreign materials, special machinery being required which makes the cost of cleaning higher, about two cents per bushel being charged for grain with the heaviest foreign material. This offsets the higher value of the foreign material, making the profit to the buyer about the same for both kinds of separable materials. Considerable trouble has been encountered in docking wild oats. At the beginning of the season the openings in the samplers probes were

too small to admit the oats freely and consequently the wheat was underdocked as much as two or three pounds in some instances, which meant a loss to the purchaser; but the difficulty has been remedied although there is occasional loss. Besides, oats are so difficult to clean from wheat that a pound often remains in the grain after being cleaned. This, of course, reduced the profits due to the dockage.

Table XVI. The effect of hairy vetch upon the price of wheat.

Grade.	Foreign material (per bu)	Value of wheat per bushel				Value of foreign material.	Loss to shipper.
		Merchant A.	Merchant B.	Merchant C.	Average price.		
2 Nor.	0 lb.	\$1.18 1/8	\$1.16 1/8	\$1.18 3/8	\$1.17 4/8	.000	.000
2 "	1/4 "	1.18 1/8	1.16 1/8	1.16 3/8	1.16 7/8	.001	.007
2 "	1/2 "	1.17 1/8	1.16 1/8	1.16 7/8	1.16 6/8	.002	.009
2 "	1 "	1.17 1/8	1.16 1/8	1.15 5/8	1.16 2/8	.004	.016
2 "	2 1/2 "	1.17 1/8	1.15 1/8	1.15 1/8	1.15 6/8	.010	.027
3 "	3 "	1.13 5/8	1.13 1/8	1.13 1/8	1.13 2/8	.012	.054

(1)

(1) No cleaning charge is considered in this table, since grain containing hairy vetch is usually not cleaned, but is mixed with grain that is free from this noxious material so that the vetch does not lower the value of the grain for milling purposes.

There are admixtures of weed seeds and other grains that can not be entirely separated from wheat and that lower the quality of the flour, consequently lowering the market price of the grain. One of these weeds that has been problematical for the inspection department and the trade this year is hairy vetch commonly known as wild pea. It is a small black seed, the diameter of wheat and hence extremely difficult to clean. It is also injurious to the flour when present in small quantities. The Bureau of Plant Industry <sup>(1)</sup> has found that one per cent of this weed will depreciate the value of flour, so that the mills do not want grain infected with such a mixture, and the grain which contains it is used by the elevators for mixing purposes. It is bought largely by the elevators and mixed with grain free from hairy vetch until it contains such a small per cent of it as not to be injurious for milling purposes.

The grain used in Table XVI is the same type as in previous studies but contained admixtures of hairy vetch. Vetch has little commercial value, being worth about eight dollars per ton when mixed with other foreign material. The effect upon the price is very marked; less than one per cent lowering the selling value, and the sample containing three pounds, or five per cent, being worth four and one-half cents less than the grain free from this noxious weed; considering the value of the dockage the buyer lost \$.054 per bushel because his grain was infected with vetch. It should be noted that the sample containing the three pounds of dockage is graded No. 3 Northern; this is the same kind of grain as

(1) United States Department of Agriculture, Bulletin 338, Dec. 30, 1915, p. 19.

the other samples, but was graded low by the inspection department because of the high per cent of hairy vetch.

The terminal buyers are making a good profit upon separable foreign materials, particularly where the amount present is relatively heavy. The producer, on the other hand, must incur an added expense for harvesting and threshing, for marketing, for freight, a loss in yield, and then receives only a small fraction of the value of the foreign material, making the foul material a complete loss to him. The shipper has facilities at his command to clean the grain at the terminal markets; the terminal elevators have cleaning apparatus for most of the common foreign materials, and will clean grain for a shipper at a reasonable rate. More shippers would do well to take advantage of this opportunity and thus realize the value of all parts of their grain. The commission merchants, guarding the interests of their shippers, frequently order consignments cleaned when conditions warrant, so the country shippers are not entirely at the mercy of the terminal buyers.

It would be possible for the state to exercise close supervision of terminal dockage and empower the inspection department with authority to order consignments of grain cleaned before it is sold; but such a course would not be practical in a season whose crop is as foul as in 1915, since it would congest the grain traffic owing to inadequate terminal facilities for cleaning a considerable part of the large receipts at Minnesota terminals.

The Canadian Government's rules governing terminal elevators provide, <sup>(1)</sup> "On wheat carrying a dockage of five per cent or more, after deducting one and one-half per cent of the gross

(1) Report of the Department of Trade and Commerce, Part V. - Grain Statistics, Ottawa, Canada, 1915, p.35.



weight for waste, a return will be made for the balance of the screenings". The shipper or owner must call for the screening within thirty days from unloading and the cost of cleaning is one-half cent per bushel. The Dominion Government thus does not compel cleaning, but provides terminal facilities for the shippers to have their grain cleaned at a nominal cost. Minneapolis has the terminal facilities and opportunities for cleaning; if the time ever comes when elevators refuse to clean grain without discrimination, the state should compel them to clean grain when requested, and it would do well to regulate the charge for cleaning in all terminals as it now does in the few public warehouses. Terminal facilities for cleaning are, therefore, at the shipper's command and will help him to secure the full commercial value of his grain if he will but take advantage of them. The only satisfactory solution of the vexatious problem of dockage, however, is to adopt better methods of cultivation, to eradicate undesirable weeds, and to have the grain cleaned on the farm where the foreign material may be used for feeding purposes.

## CHAPTER V.

## CONCLUSION.

An analysis of the development of grain inspection impresses one with its social and economic importance. Grading at country points is very poor because of handling facilities and methods of competition, and the tendency appears to be to grade grain too high. However, better elevator facilities, improved terminal inspection, and the dissemination of market information have made possible better methods of grading at country markets; as further progress is made in this direction, country grading will become more efficient, but it can not attain the high degree of efficiency of inspection terminal markets because of the very nature of country competition.

The Minnesota markets present all the inspection problems characteristic of the primary grain markets. Like other primary grain markets, the inspection and grading problems of Minneapolis and Duluth have multiplied as new aspects of marketing have developed. The problem of organization is one of the most important but is being gradually solved; better coordination of the working force, new apparatus for grading, and the flour laboratory make more uniform grading possible and appear to secure more scientific grading as is evidenced by the decrease in the per cent of original grades changed upon re-inspection and appeal. The commercial value of wheat is based upon its milling value so that a flour laboratory is a valuable addition to the inspection department if the grades which it establishes are to represent as nearly as possible a market value and thus be of greatest benefit to the trade.

Every inspection department is confronted with the problem of organization and appointment, and Minnesota, like other state inspection departments, has been trying to solve it and has attempted to secure an impartial and effective method of appointment. It has reached a partial solution by inaugurating a commendable system of promotion by examination, but has not eliminated the possible operation of the political "spoils system" in the original appointments.

As to the appointments to the Boards of Grain Appeals, which determine the grade standards, there is much justifiable criticism. The members of these Boards, who should be expert judges of grain, are frequently appointed, not for their knowledge of grain, but because of other considerations. Under such administration, grain inspection can not be most effective; the only satisfactory solution appears to be the adoption of a civil service system for appointments of both the inspectors and members of the Boards of Grain Appeals, and to make their organizations independent of present state departments. Inspection would then be more nearly free from trade and political influences, it would be administered by men chosen for their ability to judge grain, and thus would provide the grain trade a more uniform and scientific inspection.

This reorganization would aid in the solution of the ever present problem of determining grade standards since it would provide a more competent organization to establish the grades. Every crop presents this problem of grade standards anew because of the different characteristics of different crops. As we have seen, the tendency is for the standard to vary with the crop, a

poor crop tends to pull the standard down and vice versa, as is evidenced by the Illinois grade standards for the present season. This is a difficult problem for the inspections to solve and it is important to the trade since grain merchants, particularly the buyers, prefer a standard of grading that is uniform from season to season. No doubt this tendency will be largely overcome as new methods for determining the commercial value of grain are secured for the inspection departments, and as laboratories are equipped and utilized.

Although the grade descriptions are being slowly changed and improved, many of them are still vague and indefinite; this is true of all inspection departments. For example, grade definitions contain the terms "clean", "bright", "sound", "sweet", but who knows what they mean; there are such varying degrees of cleanness, color, damage, and sweetness in grain that they may have a different meaning to men of expert judgment. What the market needs is more definite grade terminology. It is admittedly difficult to give some of these terms, such as "bright", or "sweet", a definite measure but no doubt some progress could be secured by furnishing available samples illustrating more of these characteristics, and in the case of the terms "dry" and "clean", maximum amounts of moisture and foreign material may be easily determined for the different grades. Some progress has been made along the lines indicated, but there is much to be done as an analysis of the grades of any inspection department will show. Progress in this direction will materially aid in the solution of greater uniformity of grain grading.

How to deal with the foreign material in grain will be a

trying problem as long as producers continue to allow weeds and foreign grains to infect their fields, and there will always be some foreign material even with the best methods of agriculture. It is evident that the shipper receives a higher price for his grain when it contains a high per cent of separable foreign material but the increase in price does not represent the full value of the foreign material, and when we consider the additional cost of threshing, handling, and freight, it is apparent that the shipper realizes a complete loss by not separating the foreign material from his grain and selling the grain and foreign materials separately.

There are terminal facilities at the shippers' command for cleaning grain at a nominal cost, and it is feasible for them to take advantage of the opportunity, so that the complaint of producers concerning terminal dockage is ill-advised if they do not use the means available to secure the full value of the foreign material. It appears that the only way in which the state inspection department may guard the interests of the producers and shippers in this respect, is to deal with the foreign material in grading so that the highest possible value may be secured for the grain. Grains that are uniformly clean are adapted to the system of allowing a maximum percentage of such material in each grade, but where the amount of foreign material is uniformly heavy, as in spring wheat, and is separable so that it does not injure the grain for milling purposes, the best interests of the producer and shipper favor a dockage system since it keeps much of the grain in a grade higher than it would otherwise have secured; grain which grades No. 1 Northern has a definite market value and the price which it commands does not depend so much upon the ability of the commis-

sion man to sell it as though it has been given a lower official grade. It is true that the seller does not receive the full value of the dockage, but he probably receives more than if it had remained as foreign material and had been worked out through the medium of grade.

The analysis of available data does not show any collusion between the inspection service and any trade interest, or that any trade interest has any effect upon the standard of grading. The buying interests are a constant factor in the market so we would not expect to find any statistical evidence of their influence upon inspection; judging from the personnel of the inspection service, the only possible influence is psychological, i. e., because of constant demands for lower grades, the inspection department might unconsciously raise the standard of grading. The history of inspection at Minneapolis and Duluth appears to bear out this contention and causes the state inspection department some difficulty to keep the grade standards at the two markets on a par.

The contention of producers that inspection on grain arriving is more severe than <sup>on</sup> grain going out of the market also appears to be without foundation. It is true that a higher per cent of original inspections on "out shipments" are raised than of original inspections raised "on arrival", but a lower per cent of "out shipments" are reinspected and appealed which indicates that the terminal elevators use better judgment in calling for reinspections and appeals than do the shippers and commission men. The basis of this claim of the producers is the excess of shipment over receipts for the highest grades at the terminal elevators, but as suggested in Chapter IV, this does not necessarily show a



lower standard of grading for shipments than receipts; it may be explained by the legitimate practice of mixing grain.

The producers of Minnesota, who are a strong factor to be considered in any state policy, have brought their influence to bear upon state inspection as is evidenced by the larger number of original grades that are raised on reinspection and appeal than are lowered. This might be attributed to severe grading on the original inspections were it not the avowed policy of the department to give grain the benefit of a doubt and grade it the higher of the two grades in question. This policy is doubtless advantageous to the producers, since the grain is more often placed in a higher grade of recognized superior value than if the policy were reversed. It is argued that in a long time this policy pulls the standard of grading down and consequently depresses the price; this may, in a measure be true, but it does not draw the price so low that the total value of the producers' grain is as low as would be if the policy were reversed, and the grain given the poorer of the two grades in question. This may appear to be an unfair advantage for the producer, but since he is at a disadvantage to the buyer, because of distance from markets and less knowledge of trade practices, it is possibly just.

Producers everywhere are suspicious of terminal methods of inspection and grain marketing, but in certain instances, as in North Dakota and Kansas, this attitude is intensified because those states have no voice in the regulation of the trade organizations through which their grain is sold. These are difficult problems for state inspection departments and are undesirable for the markets, since it suppresses that friendly

relationship between the market and its constituents, and in attempting to secure control of market supervision, it has resulted in two inspection systems at the head of the great lakes and at Kansas City, where the unity of each market demands only one inspection department.

The Minnesota inspection department has achieved some success in alleviating the strained relationship between North Dakota producers and the Minnesota terminal markets, an agreement between the Superior terminal elevators and the Wisconsin inspection department has been reached, but the problems are far from being solved. The limited jurisdiction of the state makes it impossible for Minnesota to satisfy the North Dakota producers as it can satisfy its own, or to compel Minnesota inspection service at Superior. The only satisfactory solution lies in the nationalization of this important feature of marketing.

Minnesota state inspection thus has shown elements of strength and weakness. Like any department that must adapt itself to changing methods of marketing and must contend with conflicting trade interests, it has not met the requirements of a good inspection in all essentials, but for the most part, it has been efficient and progressive; it is recognized as one of the best grain inspections in American and world markets. Although the personnel of the Boards of Grain Appeals has at times been poor, the inspection department has been particularly fortunate in selecting inspectors of splendid judgment of grain, which has made its high rank possible. Progress in grain inspection must come slowly, but judging from its policy of recent years, we are led to believe that the state of Minnesota will make the necessary changes in the

organization and methods of its inspection service so that it will provide an increasingly efficient service for the grain industry . of the Northwest.

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