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LETTERS FROM AN OLD RAILWAY OFFICIAL

SECOND SERIES

TO HIS SON, A GENERAL MANAGER

Charles DeLano Hine

LETTERS FROM AN OLD RAILWAY OFFICIAL

SECOND SERIES

TO HIS SON, A GENERAL MANAGER

BY

CHARLES DELANO HINE

1912

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FOREWORD.

The author of the letters composing this book, which appeared serially in the *Railway Age Gazette* in 1911, is a West Point graduate. He served as a lieutenant in the 6th United States Infantry. He is a civil engineer. He is a graduate of the Cincinnati Law School. Leaving the Army to enter railway service, he worked as freight brakeman, switchman, yardmaster, emergency conductor, chief clerk to superintendent, and trainmaster. When the war with Spain began in 1898 he quit railway service and participated in the Santiago campaign as a major of volunteers. After the war he re-entered railway work, and was trainmaster and later general superintendent. Subsequently, he did special railway work in various staff positions for both large and small railways in the United States, Canada and Mexico.

He was for a time inspector of safety appliances for the Interstate Commerce Commission. In 1907 he assisted in the revision of the business methods of the Department of the Interior at Washington, D.C. Then he was receiver of the Washington, Arlington & Falls Church Electric Railway. In 1910, as temporary special representative of President Taft, he outlined a scheme for improving the organization and methods of the executive departments of the United States government. Meantime, in July, 1908, he had become special representative of Mr. Julius Kruttschnitt, director of maintenance and operation of the Harriman Lines, and had entered on a study of the needs of the operating organization of those railways and of the means that should be adopted to meet those needs. The result of this work was the adoption by most of the Harriman Lines of the unit system of organization. On January 15, 1912, Major Hine became vice-president and general manager of the Southern Pacific Lines in Mexico and the Arizona Eastern, having about 1,600 miles of railway.

The foregoing details have not been given for biographical purposes. They have been given to enable the reader to understand the author's point of view. Or, rather, his points of view. For few men have had opportunity to look at the railway business from so many angles, both practical and theoretical. Given such an education, such a training, such a varied experience, and a keen observer's eye to see, an active, logical mind to generalize, and a graphic, witty, scintillant English style to set down the results of observation, experience and thinking, and, if their possessor turn to writing, the product is sure to be literature of interest and value. The readers of Major Hine's first series of letters, "Letters of an Old Railway Official to His Son, a Division Superintendent," found them at once entertaining, suggestive and instructive. They will find equally or more so the second series, written after a wider experience, and now embodied in this volume.

One of the greatest problems of modern railway management is that of organization. Little railways have been combined into big ones; and big railways have been consolidated into big systems. To so organize these extensive systems that each division and each railway shall have enough individuality and autonomy to deal effectively and satisfactorily with the conditions and needs local to it, and at the same time bring about the correlation and unification of all parts of the entire system essential to the most efficient operation—this is one phase of the problem. To develop men able to administer skilfully departments having many and varied branches—this is another phase. It was as a means to solving this great problem that Major Hine worked out the unit system of organization now in effect on most parts of the Harriman system. In the letters composing this book he has described, not with the cold, hard outlines of a blue print, but vividly, and with fullness of practical illustration, the nature, purposes and workings of the unit system. Whether the reader agrees with the author's views or not, he cannot but be interested in them as the views regarding a scheme of organization which is the subject of widespread interest and discussion of the man who originated and worked out that scheme of organization.

Besides organization the letters deal with many other questions of practical interest both large and small—with the relations of the railway with the public; its regulation by public bodies; the labor situation on the railways, etc. Indeed, they touch on almost every phase of contemporary railway conditions and operation. Full of human touches, they clothe the skeleton of railway organization and operation with flesh and blood; and will give the current reader and the future historian a better picture of contemporary railway working than many more stilted and pretentious books.

SAMUEL O. DUNN.

FILE NUMBERS.

Letters From A Railway Official

LETTER I.

THE NEW GENERAL MANAGER.

Chicago, April 8, 1911.

My Dear Boy:—Once more a circular comes to gladden my heart and gratify my pride. This circular announces your appointment as general manager, a position of honor and importance, extensive in its opportunities for good administration as well as for wasteful neglect.

Some seven years ago, when you were a division superintendent, I wrote you a book of letters which caused us both to be taken more seriously than perhaps we shall ever be again. Can T. R. come back? I don't know, I am sure, but your old Dad can and will. For never before in our splendid profession of railroading has there been greater need for the wisdom of old age, the enthusiasm of youth, and the balanced execution of middle life. We, the railways, we the most scattered and, ergo, the most exposed of property rights, are the first of the outposts to receive and to repel the assaults of anarchy and its smaller sister, socialism. Subtle, sinister, and specious is the reasoning which supports the claims of those who single out the arteries of inland commerce as a thing apart, as something immune to the irresistible laws of cause and effect. Shall we sit idly by, because we have had our part? No, my son. In that inspiring painting, "The Spirit of '76," the old man and the boy, equals in enthusiasm, typify the soul love of liberty of an aroused people. Let you and I, therefore, do our little part to call to arms our brethren of a nation-long village street. Perhaps we are only hired hands of imaginary "interests." Perhaps, nevertheless, we are liberty-loving, God-fearing, right-thinking American citizens. Perhaps we do not need to be backed into the last corner before we turn and stand for the God-given rights for which men of all ages have been willing to fight and die. Perhaps the muck-rakers have not procured all the patents pertaining to perfection, potential or pronounced. But be that as it may, you and I can at least be heard, can have our day in the forum of public opinion, which after all is the court of last resort. In the language of Mr. Dooley, the decisions of the Supreme Court follow the popular elections.

What shall we do to be saved? First, put our own house in order that example may protect precept. It is a pretty good house after all. Only eighty years old to be sure, short in epochs of experience, but relatively long in æons of achievement. It already has some degenerate offspring, but mighty few when you consider the rapidity of forced breeding, the intensity of incubation. Transportation, acknowledged as second only to agriculture in the world's great industries, has advanced faster and further in eight decades than has agriculture in eight centuries. That is something to be proud of. Therein is glory enough for us all.

Unfortunately, pride goeth before destruction. In the bivouac of the living, glory is a mighty unreliable sentinel. Let us hang up pride and glory as our Sunday-go-to-meeting clothes. Let us don consistent practice and tenacious watchfulness for week-day wear. Let us cease to temporize with principle when such unmanly action seems easy and inexpensive. Nothing is so expensive ultimately as a violation of principle. A platitude, you say. So it is. The aforesaid T. R. has gained a great hold on the American people, at one time a strangle hold, by repeating platitudes over and over again. Great is the man who can measure the limitations of his fellows. Let us take a leaf from his book and repeat, reiterate, and reverberate the Ten Commandments, and the greatest of all commandments, the Golden Rule, alias the Square Deal.

It takes an abnormally intelligent people to grasp at first blush the truism that railways should charge "what the traffic will bear" for the same good reason that the corner grocer makes all the profit the business will survive. Therefore, put the soft pedal on *cost* of service and a fair *return* on capital invested.

Get on the band wagon and follow the able lead of the good old *Railway Age Gazette* in playing the logical tune of *value* of service rendered, of charging all the admission fee the show will stand. The people will not go to church to hear our preaching. We must reach them in the highways and the byways, in the moving picture shows, and through improvised Salvation Armies of self-interest. Do not expect the people to espouse a cause in which we are half-hearted. Either we are right or we are wrong. Either the government should own and run the railways, or the stockholders should retain possession and we, the intelligent *entrepreneur* class, should continue our scientific management—for scientific it has been.

In a world of complexities, filled with relative things, some truths are so absolute that they are axiomatic, some positions so pronounced that there is no middle ground. From Trafalgar there rings through the ages Nelson's signal, "England expects every man to do his duty." Its interpretation and its adaptation for us to-day mean that every railroad man, every home lover, every believer in property rights must defend the sound position of the railways, must anticipate

the assaults of pseudo-socialism. The individual is the indivisible unit of society. The family is the consecrated unit of civilization. The home is the prime requisite for the family whose very existence depends upon the right of property, tangible or intangible.

You say that all railway men are doing something along this line. So they are, but nearly every one can do more if intelligently and persistently directed. We have taken too much for granted in believing that the legal department would look out for legislation, and the press agent for publicity. This phase, like many of our problems, is a question of organization, which itself as a science is a branch of sociology. On most railways some department—never, of course, our own—has unconsciously tried to be bigger than the whole company, in violation of the axiom that the whole is greater than any of its parts. When, by proper organization, we balance these departments—especially on the other fellow's road—we shall be in a better position to present a more united front in forestalling the arrival of the common enemy, prejudice and his principal ally, ignorance. "Men," says Marcus Aurelius, "exist for one another. Teach them, then, or bear with them." We, the railroads, have done our share of bearing. It is time to do more teaching. Before we can impart knowledge we must know ourselves, we must be sure of our own information.

Naturally, I want you to be the best general manager in the country. Therefore, if I am a little too didactic at times, you must be patient with me. Of course, you will have to work out your conclusions for yourself. Remember that I am too old at this teaching game to try always to think for other people. My job is so to state the propositions that you will reach the answers in your own way. Incidentally, the more you think you have discovered for yourself, the greater the credit due your teacher. Men are only boys grown tall. As grown-up children they seem to prefer the misfits of their own manufacture to the hand-me-down assortment from the shelves of stored experience. Too often the employing corporation pays the bill for educating an official for his duties after his promotion and appointment, for the cloth he wastes in selecting unwise patterns of procedure.

Most of our large corporations are still in a stage of industrial feudalism. In the middle ages the feudal baron and his methods were absolutely essential to preserve civilization for society. Without him and his forceful ways the relapse to barbarism would have been rapid. In the earlier periods of the large corporation the industrial baron and his ofttimes lawless audacity were essentials of corporate existence. As these great types die off, their system dies with them. Supply keeps close on the heels of demand. These feudal barons of industry and commerce are breeding no successors because none are needed. As a government of laws succeeds a government of men, so administration by system displaces administration by personal caprice. The scheme of progress now demands a higher type of corporation official, and he is being rapidly developed. Altruism, adaptability, consideration and courtesy are the more modern requirements. The successful official of to-day is more of a sociologist than ever before. He must study human nature from its broadest aspects. He must know the public, its whims and caprices, its faults and foibles, its intelligence and its strength. He must learn to know his men that he may see how many things they can do, not how few. Human nature is mighty good stuff. The more it is trusted the better it responds. The feudal baron did not know this. He was jealous of his own authority, because more or less conscious of his limitations, of the weakness of his system. Those who take up his self-imposed responsibilities must be better men. They must be so sure of themselves and of the science of their methods that they can trust others, can delegate authority to the man on the ground. The task of the general manager to-day is so to decentralize authority that the company can obtain the best thought of the humblest employe, that indivisible unit of society whom his feudal superiors have trusted too little. The most important unit of organization is the individual. Give him his due weight as a living, thinking man, and you increase the mass efficiency of the corporation.

This run is too heavy for stringing on one schedule. I am now giving you the first terminal figure, 12:01 a.m. at Problem. Next time if I can push you to Principle you can perhaps flag over a station or two toward the despatcher at Understanding, whose wires have been known to go down in stormy weather.

With a father's blessing,

Your affectionate and rejuvenated,

D. A. D.

LETTER II.

BUILDING AN ORGANIZATION.

Chicago, April 15, 1911.

My Dear Boy:—Nearly every man entrusted with authority over his fellows flatters himself that he is a born organizer. Flattery is never more deceptive than when applied to one's self.

For every good organizer there are a hundred good administrators or managers. What often passes for good organization is first class administration. Yes, many a mother's son who reads this will exclaim at first blush, "That is just what I have been saying for a long time. It beats all how weak some organizations are. I am glad that my organization can stand the test of such criticism."

If elements of self-perpetuation are prime essentials of good organization, the Pharisee family are certainly entitled to bid in the preferred runs.

The corporation was evolved to supply a demand of society. Life, property, material, moral and spiritual welfare could not be left to depend upon the uncertain earthly existence of the leader or trustee. So, both rationally and empirically, by reason and by costly experiment, came the corporation to beat Death at his own game. Like all progress the corporation was resisted, because in the divine scheme of things the radicals never long outnumber the conservatives. Like all real progress the corporation idea won because it was needed. The corporation, whether governmental, religious, industrial or commercial, marks a distinct advance from feudalism by protecting the rights of the many against the caprice of the few. Because we have moved so fast might has often seemed to be right. Because the line of least resistance is the most attractive, we have sometimes backed down the hill and doubled when a good run with plenty of sand would have carried us over. Large corporations, including many railways, have often failed to attain maximum efficiency. Much of this can be traced to a neglect to carry out consistently in practice the sound working conception of the corporation. The corporation has helped society to emerge from political and financial feudalism. The interior organization and administration of most corporations, including government itself, are still too feudal in conception. The problem of to-day is so to eradicate this feudalism that the corporation can have the benefit of a free play of its constituent forces. Where feudalism exists the effective working strength is limited to the personal equation of the man at the head. The United States government is stronger than Washington, or Lincoln, or Taft. The Great Northern Railway measures its present acknowledged effectiveness by the man the Swedes call Yim Hill. The United States government grows stronger with every administration. The Great Northern Railway, too strong to be destroyed, faces a period of relative distress with the next dynasty. The Pennsylvania Railroad is stronger than such strong men as Scott, Cassatt and McCrea. Both the United States government and the Pennsylvania Railroad, although among the least feudal of large corporations, can still eradicate feudalism from their interior organization and administration. That, in good time, both will do so cannot be doubted. Inconsistencies between comprehensive conceptions at the top and narrow applications at the bottom are often overlooked. When disclosed and appreciated these incongruities soon give way under pressure of the broad policies above. We must build up from the bottom but tear down our false work from the top.

Organization is a branch of a larger subject, sociology, the science of human nature. Organization is not an exact science like mechanical engineering, for example. The variables in the human equation defy entire elimination. We check and recheck engineering conclusions. We compute and recompute material strains and stresses. We run and double back with the dynamometer car to try out our tractive power. We test and retest materials. We weigh and measure our fuel and our lubricants. We do all this for material things, which, because more or less homogeneous, are the easiest to measure. When we come to the really hard part, the judging of human nature, the co-ordination of the heterogeneous human elements, our self-confidence denies the necessity for preconceived practical tests. Because he is our man, because he followed us from the sage brush or the mountains, he must be all right. "Just look at our results." Right there, my boy, shut off and pinch 'em down a little. What are results? Does any one know exactly? One year they are operating ratio, another, train load, and later on, net earnings. In no storehouse do material things deteriorate to scrap value faster than does the intangible, indeterminate stock article, results. No, I am not a pessimist; I still see the ring of the doughnut on the lunch counter. But I do object to being fed on birds from year before last's nests. I believe the railways hatch out better results every year, but I also feel that improvement should and can be made even faster. It is largely a breeding problem. How best can we blend our numerous strains to produce a balanced output? Too often we try to do this by cutting off the heads of all the old roosters, whose craws really contain too much good sand to be wasted. A change of diet to a balanced ration may

be all-sufficient.

The wonderful Nineteenth Century in the name of a proper specialization went too far. It over-specialized. The still more wonderful Twentieth Century will swing back to a balanced specialization. The medical colleges are learning that they can not turn out successful eye and ear specialists, the law schools that the constitutional or interstate commerce lawyer is the production of a later period. The successful specialist must first have the foundation of an all-round training. Broadly speaking, one applies everything of something only by learning something of everything. We all believe in specialization. Where we differ is as to the point where specialization stops and overspecialization begins. We all believe in religion. Where we differ is as to which is the main line and which the runaway track, as to which derail deserves a distant banjo signal and which an upper quadrant. Orthodoxy is usually my doxy. The great fear is always that the other fellow, being less orthodox than we, will try to put over some constructive mileage on us. Sometimes this causes us to make his run so long and his train so heavy that he ties up under the sixteen-hour law and we miss supper hour going out to tow him in. An empty stomach discourages drowsiness, and we may then stay awake long enough to realize that said other fellow was just as orthodox as anybody about trying to make a good run.

The corollary of specialization is centralization. The undesirable corollary of overspecialization is overcentralization. Get out your detour map, approach this proposition by any route of reasoning you please, and you will reach the same conclusion.

Railway administration to-day suffers most of all from overcentralization. Trace this to its source and you will find overspecialization of function, and its concomitant, an exaggerated value of certain constituent elements of administration. When in doubt, recall the ever applicable axiom that the whole is greater than any of its parts. Some people confuse the terms and ideas, concentration and centralization. Proper concentration in complete units by an earlier convergence of authority permits decentralization in administration. A lack of such early concentration makes centralization inevitable. Again, concentration of financial control is not incompatible with decentralization of administration among constituent controlled properties. When the big bankers have time to think out these propositions for themselves they will permit the railways to get closer to the people and hostile legislation will diminish if not disappear.

Organization as a science seeks to develop and to support the strong qualities of human nature. Organization likewise takes account of and seeks to minimize the amiable failings of human nature. Constitutional liberty insures the citizen protection against the caprice of the public officer. Administrative liberty demands an analogous measure of protection for the subordinate from the whim of his corporate superior. An amiable failing of many a railway president is to be satisfied with having everybody under his own authority, and to forget that the official next below may be embarrassed by having only a partial control. The general manager who insists the hardest that his superintendents are best off under his departmental system will squirm the quickest under the acid test of having the chief supply, the chief maintenance or the chief mechanical official report to the president. The superintendent who finds himself with a complete divisional organization is oblivious to the troubles of a distant yardmaster with car inspectors. When your old Dad was a ninety-dollar yardmaster some of his most important work was at the mercy of a forty-five dollar car inspector. The latter was under a master mechanic a hundred miles or more away, who in turn could usually and properly count on the support of the superintendent of motive power. The obvious inference was to relieve the yardmaster of responsibility for mechanical matters. From one viewpoint these mechanical questions are too highly technical for the yardmaster. From another they are matters of common sense requiring more good judgment than technical training. No, I would not put every yardmaster over the roundhouse foreman and the car inspectors. What I would do would be to make the position of yardmaster sufficiently attractive to impose as a prerequisite for appointment a knowledge of mechanical as well as transportation matters. Gradually I would work away from the switchman or trainman specialist to the all-'round man in whom I could concentrate authority as the head of an important sub-unit of organization. Instead of leveling downward, as the labor unions do, by assuming that the average man can learn only one branch of operation, I would recognize individuality and gradually develop a higher composite type. Because some car inspectors are not fitted to become yardmasters is no good reason for practically excluding all car inspectors from honorable competition for such advancement. When we build a department wall to keep the other fellow out we sometimes find it has kept us in. We blame the labor unions for these narrowing restrictions of employment and advancement. Look once more for the source, and you will find it among our predecessors in the official class, a generation or more ago. These officials insisted upon planes of department cleavage which the men below were quick to recognize. Railway manhood has been more dwarfed by exaggerated official idea of specialization with resulting departmental jealousies than by the labor unions.

Therefore, my boy, let us get some of these inconsistencies out of our own optics before we talk too much about the dust that seems to blind the eyes of those who are exposed to the breezes of that world famous thoroughfare which faces old Trinity Church in New York.

Affectionately, your own,

LETTER III.

THE GENERAL MANAGER ON THE WITNESS STAND.

Chicago, April 22, 1911.

My Dear Boy:—Did it ever occur to you how easily a bright lawyer could tangle up many an able railway official on the witness stand? Nowadays we have to spend more or less valuable time testifying about service, rates, capitalization, valuation, practices, methods, and a score of other things that become of public interest. Whether this is just or unjust, necessary or unnecessary, is beside the question. It is a condition, not a theory, that confronts us. The wise railway man, therefore, so orders his official life that it may endure the scrutiny of both the persecutor and the prosecutor, of both the inquisitor and the investigator, of both the muckraker and the political economist. It sometimes happens, since men are only boys grown tall, that public hearings are accompanied by stage settings for dramatic effect; that trifling inconsistencies are magnified into egregious errors. Let me picture part of such a hearing with a general manager on the stand:

Question: You testified, Mr. General Manager, on the direct examination that your road is well managed and has a highly efficient organization, did you not?

Answer: Yes, sir, we think we have one of the best in the country.

Q. Would you mind telling the able members of this Honorable Commission in just what your superiority consists?

A. Not at all, sir. In the first place, we have a great deal of harmony and work very closely together.

Q. Did you ever know a railway official who did not claim the same thing for that part of the organization over which he presided?

A. (Hesitating.) Well, now that you mention it, I can't say that I ever did. (Sudden inspiration.) But you know there is a great deal of bluffing in this world.

Q. (Drily.) What style of anti-bluffing device has your company adopted?

A. Of course, you are speaking figuratively. Such a thing isn't possible. We have a pretty good check in the fine class of men we have developed.

Q. Then, it is a sort of breeding process?

A. Yes, sir, that's it.

Q. To go a little further, has your company any patents on improving human nature?

A. No, sir, we don't claim that.

Q. Is it not a fact that your officials and employes are average citizens recruited and developed about like those of other roads?

A. That is hardly a fair way to put it, but I suppose they are.

Q. Why isn't it fair?

A. Because it leaves out of account the acknowledged efficiency that comes from having men well treated and contented, and better instructed than others. Some farms make more money than others because the old man gets more work out of the boys.

Q. Then your road has officials who can radiate more divine afflatus than others?

A. I didn't say that. We do the best we know how.

Q. What is organization?

A. Why organization is—let me see—why, organization is the name we use for the men—the people, the forces we hire to run our road. It is hard to give a concise definition. I might ask you what law is.

Q. That's easy, law is a rule of conduct. Now, tell me, please, who runs the road?

A. Why, the officers run the road, the men do the work.

Q. Did you not just say that you hire men to run the road?

A. I didn't mean that.

Q. Then in your business you are not very accurate. You say one thing and mean another.

A. No, sir; we may have more sense than you think we have. We spend a lifetime at this business and must learn something about it.

Q. Will you please tell this fair-minded commission just how you run the road, just how you attempt to minister to the needs of the intelligent people of this great commonwealth?

A. Now, sir, it is a pleasure to testify. You are getting away from definitions and technicalities and down to practical facts, where I feel more at home. I will be glad to tell you all about it. In the first place a railway is such a big affair that we divide it into departments.

Q. Excuse me, what is a department?

A. A department is—well—I can make it clearer by describing what it does. As I was saying, we divided it into departments, and a department is—well—a department is—why, something so different from everything else that we put it off by itself and hold the head of the department responsible for results. We are very particular not to interfere with the details of the departments.

Q. Pardon me, but the present members of this exceptionally able commission, inspired further I may say by the example of our patriotic governor, are accustomed to give profound consideration to these great questions. (Modest pricking up of ears of commission, with determined composite expression bespeaking relentless performance of a dangerous duty.) Please, therefore, tell us what your department does.

A. As I testified on the direct examination mine is the operating department; as general manager I have charge of operation.

Q. What does that include?

A. It includes transportation, and maintenance and new construction. It handles the business the other fellow gets.

Q. Who is the other fellow?

A. The traffic department.

Q. Of another company?

A. Why, no, of our own. It is just another department. It deals with the public, it gets the business, it makes the rates; excuse me—it recommends rates to honorable bodies like this commission.

Q. Then you in the operating department don't deal with the public?

A. Yes, sir, we do, more and more every year.

Q. Is the traveling freight agent in your department?

A. No, sir, he is in the traffic department.

Q. Then you have no control over him?

A. No, sir, no direct control, but as I said before, we all work very closely together on our road.

Q. It is claimed that there has been discrimination in car distribution in this state, because a traveling freight agent promised more cars to some shippers than the latter were entitled to according to the supply available. How about that?

A. I am unable to say.

Q. Getting back to your narrative, please resume the interesting description of your department.

A. As I was saying, we have several departments, each under a superintendent or other officer. We have a general superintendent, a chief engineer, a superintendent of motive power, a superintendent of transportation, a superintendent of telegraph, a signal engineer, a superintendent of dining cars, and a general storekeeper, all of whom we call general officers in charge of departments.

Q. I thought you said you are the head of the operating department.

A. Yes, sir; that's right.

Q. I don't quite understand. You say that there are eight departments in your department?

A. Yes, sir; that is what we call them. It always has been so.

Q. Then when is a department a department?

A. You see these are really not departments; they are just parts of the operating department

which is really a department.

Q. Then, why not have definite designations?

A. I don't know. We have never thought it necessary. We are getting good results and giving good service to the public.

Q. What are results?

A. I am not sure; the longer I live the less certain I am about these things.

Q. I am glad to hear that. This impartial commission has been constituted because some railway officers tried to dictate what was best for this enlightened commonwealth. Now, tell us, please, what you think of the plan the United States government has of making the "bureau" the next unit of organization below the "department"?

A. I have never given government organization much attention. The part of the government that concerns me most is the Interstate Commerce Commission, which seems made up mainly of inspectors.

Q. Have you ever studied the organization of the federal courts, and of the army and the navy?

A. I can hardly say that I have studied their organization, but I have observed them some.

Q. Then you and your road do not give much attention to organization?

A. Perhaps not to theories. We are very practical. I never could see where a railway is like the government. They are very different.

Q. Is not human nature the same in its basic characteristics, whether employed by a railway or the government?

A. I suppose that it is, but many things about a corporation are different.

Q. Is not the government the largest of employing corporations with its citizens as the stockholders?

A. Perhaps so. I would rather go on and tell you something practical about our work.

Q. Pray do so.

A. You see, I am the responsible head, so that I insist upon being consulted about all important matters, and leave only routine affairs to be acted on by my subordinates.

Q. What are important matters, and what are routine affairs?

A. Why, the important things are those that I handle personally, and routine, well, routine is what comes along every day and is so well understood that it does not require my personal attention.

Q. Do you think any three men could agree upon what should be considered routine business?

A. I don't know. I had never thought of it that way. Many things have to be left to discretion. That is where judgment comes in.

Q. Whose judgment?

A. The judgment of the man handling the matter; in this case, my own.

Q. You have been here all day. Who is handling matters in your absence?

A. My chief clerk.

Q. You did not mention him before. What officer is he?

A. He is not usually counted as an officer, but is considered the personal representative of an officer.

Q. Does he sign your name?

A. Yes, sir; but puts his initials under my name.

Q. Suppose he forgets to put his initials. Could you swear to the signature in court?

A. I don't know. You understand that is only for routine business.

Q. Does he sign your name to your personal bank check?

A. No, sir; he does not.

Q. Then the company's business with the citizens of this state receives less careful attention than your own personal affairs?

A. No, sir; the company's business comes first with me. I am a poor man to-day.

Q. When you are away your chief clerk has to sign instructions to the general officers in your department?

A. Only routine matters.

Q. Does he receive a higher salary than they?

A. No, sir; a lower.

Q. What determines relative salaries?

A. Qualifications and experience.

Q. Then you have the less qualified and the less experienced man instructing higher officers.

A. It might seem so, but in our case we are very fortunate. My chief clerk is an unusual man, and is very considerate and diplomatic. He knows that I do not stand for inconsiderate requirements of others.

Q. From whom do you receive your instructions?

A. From our president.

Q. Always personally?

A. Not always; his chief clerk is authorized to represent him.

Q. Is his chief clerk as considerate for you as your chief clerk is for your subordinate officers?

A. That is a very delicate question. I would rather not answer unless the commission insists.

(Hearing adjourned for day. General counsel sends cipher telegram to president stating indelicacy of state officials is almost unbearable; that bankers and business men should petition governor to stop destroying credit of railways.)

All of which, my dear boy, is not as bad as it sounds, but, through difficulty of explanation, points the way to desirable improvements in railway administration.

Affectionately, your own,

D. A. D.

LETTER IV.

FURTHER GRUELLING OF THE GENERAL MANAGER.

Tucson, Arizona, April 29, 1911.

My Dear Boy:—After the commission kicked for rest, the general manager tied up in his caboose. Nobody was allowed to run around him and he was marked up first out the following morning. The commission not having any agreement about initial overtime, the attorney acting as yardmaster handed him a switch list and told him to dig out these loads:

Question: How many letters a day do you write?

Answer: I don't know, a great many.

Q. How many a day go out of your office?

A. I can't state exactly, probably a hundred or more.

Q. Then you do not see them all?

A. No, that would be impossible in such a large office.

Q. Does the chief clerk see them all?

A. I think he does.

Q. You are not sure then?

A. No, not entirely. I have had no complaints about that.

Q. Is the only way you know about how things are going to have a complaint come in?

A. Not exactly. I try to keep ahead of the game.

Q. Are the offices of your subordinates run in this same haphazard manner?

A. I do not admit that it is haphazard. The general method is the same.

Q. Who is in charge of the distribution of cars?

A. My superintendent of transportation.

Q. To whom are his instructions given?

A. To the division superintendents.

Q. Does he give his instructions personally?

A. The important instructions he gives personally. Of course, he cannot do it all alone. You understand that his department deals with individual cars and has an enormous amount of detail.

Q. How many men are authorized to sign his name and initials?

A. I don't know.

Q. Then you do not regard this as an important matter?

A. Not as important as some others. That is a matter for which the superintendent of transportation is responsible. I look to him.

Q. Do you think every man charged with duties should be allowed to select his own type of organization and decide as to his own methods?

A. As far as possible, yes.

Q. Then why not let each conductor make his own train rules, and each station agent keep his own kind of accounts?

A. Because confusion would result.

Q. Is it not a fact that on most American railroads six or eight clerks are signing the name or initials of the superintendent of transportation?

A. I don't know; very likely.

Q. Does not a similar condition exist in a smaller degree in most railway offices.

A. Yes, sir, that is the system.

Q. Then who are running the offices, the officials or the clerks?

A. I always supposed the officials. You see we could not afford so many officials.

Q. Has it ever occurred to you that by having more officials you might get along with fewer clerks?

A. No, sir.

Q. Who sign for the train orders on your road?

A. Our conductors.

Q. Have not conductors and operators been discharged for signing each other's names?

A. Yes, sir. We must maintain discipline. If the train orders are not respected, accidents will result.

Q. Then you have one policy for one class of employes, and allow your officials and clerks to be a law unto themselves?

A. Not exactly. As I said before we cannot afford so many officials.

Q. Whose initials are signed to your train orders?

A. The superintendent's.

Q. Why?

A. Because it has always been that way on our road. It makes the order stronger.

Q. If initials make an order stronger, why not sign yours, or the president's, or God Almighty's?

A. That would be ridiculous.

Q. Then it is not ridiculous to sign the superintendent's initials when he is at home in bed?

A. No, that is different. We wish to emphasize the fact that the superintendent is in charge of the division.

Q. Then why not put the superintendent's photograph on all the orders? Would that strengthen him with the men?

A. No, of course not.

Q. You have been talking about the superintendent; is he the same as the superintendent of motive power?

A. No, you do not quite understand. The superintendent has charge of a division and the superintendent of motive power, like the superintendent of transportation, has charge of a department.

Q. Then the word superintendent doesn't always mean the same thing?

A. No, sir, but no confusion results. You see, the heads of departments are general officers, while the superintendent is a division officer.

Q. Which superintendent?

A. The division superintendent.

Q. Is it not a fact that on some roads there is a question as to which has authority in certain matters, the division superintendent or the superintendent of motive power?

A. I believe so, but we do not have any such trouble.

Q. (Producing copies of letters furnished by discharged office employe.) Does not this correspondence indicate a heated difference of opinion between your superintendent of motive power and a division superintendent which had to be settled by you?

A. Oh, yes; I recall, I had forgotten that. That will not happen again.

Q. What guaranty have you against similar friction?

A. I have that all straightened out. Everybody is lined up and understands that I insist upon harmony with a big H.

Q. To prevent confusion and, therefore, to save money why not make titles sufficiently distinctive in rank to prevent conflict of authority?

A. We have not thought it necessary. I do not go as much on titles as some people. The old-

fashioned way is good enough for me. A rose by any other name would smell as sweet.

Q. How, then, if you ordered roses for a funeral, would you guard against the corpse being handed lemons?

A. By sending a note or a card.

Q. Signed by your chief clerk?

A. No, sir.

Q. Do you think it is honest to have your chief clerk signing your name while you are away at this hearing?

A. There is no intent to deceive.

Q. Do you not unconsciously try to convey the idea that you are in one place when you are really in another, or that you are acting when it is really an entirely different man who is taking action?

A. Perhaps so. I had never looked at it in that way. It is a generally recognized custom.

Q. You do not seem to regard the office part as very important, as you permit a lot of clerks to take final action all day long.

A. The office is not as important as the road. I try to give the most attention to the important matters on the road.

Q. You feel that by doing so the office will in a large measure take care of itself?

A. That is it exactly.

Q. Do you not think that most railway administrative offices have grown too large to take care of themselves?

A. You see, we keep in close touch with our offices on a railroad, because when away we have a telegraph or telephone wire at our command.

Q. What good does a wire do you if you are tied up in a hearing or a conference for two or three hours at a time?

A. I fear that I have not made clear to you just how valuable a man I have trained into a chief clerk.

Q. I fear that you have not. You seem to believe the old system is all right. Do you think the last word has been said or that your road has hit upon the best system?

A. The last word on these important subjects will never be said, but we have been getting along very well.

I shall not continue further in this letter the catechismal method, lest you accuse me of forgetting that you long ago graduated from the kindergarten. So you did; but when in doubt get back to early methods. After reading recently an article on scientific management, I had to recall my catechism to feel certain that handling pig iron is not the chief end of man. We all, you and I included, sometimes show up smaller than we really are, because we seem to think only in the narrow terms of the things to which we are closest. It once fell to the lot of a young official to escort over his road some of its directors, bankers from New York. Being an enthusiast for his section of country, being an operating man with an instinct for developing traffic, he talked of progress, of the economic and social welfare of the people. When he spoke of sugar planting, or of cotton growing, of blooded stock and dairy yield, the bankers asked, "How much does it cost to raise an acre?" or "What percentage of profit do they make?" He returned from the trip feeling that money must be their god, that his directors could think only in terms of dollars and cents. It dampened his ardor for a time. Then he was so fortunate as to ride for a few days with some of the really big modern bankers. He found himself listening with open mouth to their expression of practical sociological truths. He marveled at their recognition of the human element, and he understood better why the board sometimes turned down his recommendations. His only lament was that he could not see more of them. There, my boy, is the great misfortune, there is a problem to be solved. There is too much Boston, New York, Philadelphia and Chicago. The directors seem too far away. It is a step forward that the overlords of transportation are bankers who have won their way rather than hereditary descendants of once reigning families. Some method must be evolved to make for more elastic control. Annual inspection trips will not overcome that rigidity in administration at which the public chafes and from which it seeks relief in drastic laws. An interesting and hopeful phase of present development is the election to directorates of trained railway executives like L. F. Loree and H. I. Miller. The professionally equipped railway director is a desirable evolution. Supply always follows demand, and the broad solution will be a composite made up of many elements of progress which perhaps have not yet unfolded themselves to any of us.

It is a great game, this transportation business. The more you study it, however, the more you discover that it is amenable to the same underlying principles on which rest the great and small activities of the human race. Like all professions, it has its distinct technique. Like all professions, it suffers from the inborn tendency of human nature to segregate itself behind an exaggerated class consciousness. "We are a little different," or "You do not quite understand our peculiar local conditions," are the arguments with which ultra-conservatism has opposed progress in all ages, are the obstacles which make so interesting all real contests for principle.

I make no apologies for taking you in this letter from the witness stand of the west to the financial chancelleries of the east. When both the banker director and the general manager learn that signatures on letters and tram orders must be as sacred as when signed to bank checks, we shall be winning back a little of that old-time sense of personal responsibility which is so needed for improving composite efficiency to-day. What better epitaph could any man desire than this, "He helped to teach corporations to remember that lasting composite strength comes only from intelligent recognition of individual manhood?"

Affectionately, your own,

D. A. D.

LETTER V.

LIMITATIONS OF THE CHIEF CLERK SYSTEM.

Tucson, Arizona, May 6, 1911.

My Dear Boy:—I have had a good deal to say to you at one time and another about chief clerks and the chief clerk system. From actual experience as a chief clerk I know that it is a trying position. It is because the railway chief clerks of the country are as a class such a splendid body of men that I am trying to do what I can to help them. Too many times a chief clerk misses promotion because he is such a valuable man that he has to stand still to break in all the new bosses who come along and leave him in the side track.

The chief clerk system as we know it to-day cannot long survive because it is too feudal in conception to reflect the spirit of a progressive age. We need a chief clerk to be a head clerk, a senior clerk, a foreman of the office forces, as it were. Much of the time on American railroads the chief clerk is in effect an acting official, acting trainmaster, acting superintendent, acting general manager, acting vice-president, and even acting president. As such he signs the name of his boss, the theory being that the latter, like a feudal baron or a king, is omnipresent within his own dominions. Not only does this outgrown conception violate the fundamental laws of matter; it often borders upon a breach of honor, integrity and good faith. Legal fictions are fast giving place to the law of common sense. Railway officials should not risk arraignment before the bar of public opinion for such indefensible practices.

When the chief clerk does business in the name of some one else the effect is dwarfing to all concerned. We do not get the effect of either one or two men, but that of a fraction of both. Again, the chief clerk is handling important correspondence with officials below of higher rank than himself, of greater compensation, and presumably of wider experience. Human nature is such that sooner or later the chief clerk, a junior, is telling an official, a senior, where to head in. Among the hundreds of railroad officials with whom it is my proud privilege to claim acquaintance, I have found nearly every one flattering himself, "My chief clerk never makes such breaks." To avoid awkward and embarrassing silences, I am learning to discontinue the acid test, "How about your boss's chief clerk?" So widespread a belief indicates a generic trait of human nature rather than a sporadic condition. Organization as a science seeks by proper checks and balances to minimize such amiable failings of human nature. Organized society preserves the effectiveness and dignity of its courts by allowing only a duly qualified judge to administer justice. The old clerk of the court may really know more law than the young judge, but only the latter can sit on the bench and decide causes. The lay reader must be duly ordained before exercising the full functions of a minister. The man who uses another's autograph signature in the banking business becomes a malefactor. Are we so different in the large corporations that we can with impunity ignore such safeguards?

The chief clerk system had its origin when railways were small and officials were few. On a division, for example, the superintendent was perhaps the only official and by common acceptance his clerk was really the next in rank. When a small tradesman or a small farmer goes away for a day his wife and boy may do the work without any one knowing the difference. In a larger enterprise there has to be an understudy in charge when the head is away.

You may have noticed that I use the word "rank" considerably. Rank is a practical necessity for the proper enforcement of authority. Rank makes its appearance as soon as society organizes for its own protection. Rank may be local, limited, changing and temporary as contra-distinguished from general, extensive, hereditary, or permanent, but it is rank just the same. The purest democracies clothe their chosen leaders with temporary rank. Before misconstruing the poetic aphorism of Robert Burns, "rank is but the guinea's stamp," remember that the guinea is only fluctuating bullion until the stamp of authority of government can be invoked.

Let me now enunciate a principle, which is this: "In modern organization the chief clerk as we now know him has no place. When the stage is reached that such a chief clerk seems to be needed, there should be another assistant this or that." Mind you, I do not say assistant *to*, because that little word "to" may give a sent-for-and-couldn't-come appearance. Nearly every week you notice the announcement of the appointment of an old chief clerk to the position of assistant *to* somebody. This is encouraging, since it permits him to do business in his own name. It also shows that railway officials are waking up to the distinct limitations of the chief clerk system. The discouraging feature is the failure to profit by centuries of experience of such well-handled activities as the Navy and the merchant marine. At sea the executive officer ranks next below the captain and is in effect, though not in name, the latter's chief of staff. The captain's clerk or the purser cannot hope to become executive officer and then captain without getting outside and working up through the deck. When railway executives and directors become better

students of organization, the science of human nature, their stockholders will pay for fewer unnecessary experiments. One railway profits by the discoveries and mistakes of another, as to bridges and equipment, but rarely as to organization and methods.

The United States Army, copied largely from the English, has the assistant *to* system, calling such officer the adjutant. The rank of the adjutant has been raised to captain, or rather the grade from which the colonel can select his adjutant has been elevated to that of captain. The adjutant has thus gained, and many military men hope that he will eventually be the lieutenant-colonel, and as in the Navy, be the executive officer, and, in effect, chief of staff for the colonel. Since no officer of the Army or Navy permits another to sign his name the adjutant uses his own autograph signature, but preceded by the phrase, "By order of Colonel Blank"; objectionable because it is sometimes a legal fiction. The adjutant system in the army works better than the assistant *to* system on the railroads, because the adjutant is relatively better trained for his position. Not only does the adjutant know office work, but he has learned practically to perform every duty required of non-commissioned officers and private soldiers. Very few assistants *to* could run a train, switch cars, handle a locomotive, or pick up a wreck. This is why soldiers and sailors have more faith in the ability of their officers than railway employes have in that of their officials. He who would be called Thor must first wield Thor's battle axe. We should office from the railroad rather than railroad from the office.

Since these things are so, as runs the old Latin phrase, I would recruit my office assistant from the road, from the head of a so-called department, from an official who has gained a face-to-face experience in handling men. The old chief clerk is the first man I would consider for appointment as one of my junior assistants. I would so assign him that he would get outside experience. Sunburn and redness of blood sometimes go together. For the pink tea contact of the telephone, for the absent treatment of the typewriter, I would ask him for a while to substitute the strong coffee of the caboose and the surprise test of the through freight. Office railroading has its origin in the mistaken theory of overspecialization, that office work is a highly-segregated specialty beyond the ken of the average man. The world advances, and as education becomes more general, as tenure is made more permanent, and employment more attractive, we can impose increased requirements. Suppose that it all could be so worked out that a generation hence no man would expect to be a railroad clerk until he had served some such outside apprenticeship as trackman, brakeman, switchman, or fireman, etc. This would mean that in an organization like the post office department every clerk in the department in Washington would have been graduated from some such outside position as letter carrier, railway mail clerk, country postmaster, rural free delivery carrier, etc. Every clerk in the war department would be a soldier and every clerk in the navy department a sailor. Then the papers that the clerk handled would have a living meaning for him. His action would be more intelligent. Pardon me a moment while I shake hands with the highly-conventional gentleman who is approaching—Mr. Cant B. Dunn. No introduction is necessary. We have met all over the United States, in Canada and in Mexico. We usually differ, but never quarrel, because each is so necessary to the other.

Sure, my boy, all these things can't be done right away quick, or before the Interstate Commerce Commission again asks for increased authority and larger appropriations. I do not expect to live to see the consummation, but hope that you may. I do expect to survive long enough to see a good start made along such rational lines of elasticity. Because we cannot accomplish it all at once is no reason for not making an intelligent beginning. If a compromise with principle is ever advanced its advocates should be prepared to pay the ultimate cost. Those questions on which the Federal Constitution compromised required the expensive settlement of civil war. Otherwise the Constitution has been elastic enough to cover nearly fifty states as fully as the original thirteen. It is even strong enough to withstand the latest political fallacy, the recall of the judiciary, as solemnly proposed out here in fascinating Arizona.

Remember always, my boy, that although the good old days have completed their runs, there are better days arriving and still on the road; that from beyond the terminal at the vanishing point of the perspective the best days are coming special because no railway time-table is big enough to give them running rights.

Affectionately, your own,

D. A. D.

LETTER VI.

PREVENTING INSTEAD OF PAYING CLAIMS.

Phoenix, Arizona, May 13, 1911.

My Dear Boy:—You ask me to give you my views on the handling and settling of freight claims.

I restrain my impatience and consequent desire to jump on you hard. Allow me, therefore, with expressions of distinguished consideration, to invite your esteemed attention to the fact that your valued request contains no mention of an intelligent desire for possible enlightenment on the most important feature of the problem, namely, the prevention of claims, the eradication of causes.

A railroad is a complex proposition. Seldom can we discuss one of its problems independently. So ramified are its activities that the penumbra of one shadow coincides with the outline of the next. Studied from the broadest view of railway administration, freight claims are found too often doing duty as a shadow which hides the real substance, poor operation. It was formerly the almost universal practice on American railways for freight claims to be handled and settled by the freight traffic department. It was felt that the man who secured the business, who dealt with the shippers, was the man to placate the claiming public. No, this did not always lead to rebating. It placed before the man hungry for gross revenue a temptation which he often resisted. Since the passage of the Hepburn act and the consequent inspection of claim disbursements by the Interstate Commerce Commission, the general trend of railroad practice has been to place the so-called freight claim department under the accounting department. Railroads are waking up to the fact that the new order of things means more than an accounting proposition; that in government regulation and supervision the whole matter of railway administration is involved. What we technically term "operation" is the largest of the component elements of administration.

The tendency of overspecialization has been to leave to the accounting or the legal department the matter of relations with the various branches of government, both state and federal. Since a part can never equal the whole the results have been disappointing. Railroads are learning by costly experience that traffic men and operating men must have an active part in these vital relations. Government in the long run reflects the spirit of its people. The American people as a nation are positive and constructive. The training of railway lawyers and railway accountants is often negative and resisting. The general counsel and the general auditor are inclined to tell us what we can not do. The traffic manager and the general manager, on the other hand, tell us what we can do. Out of it all should come a well-balanced administrative machine. We need the whole machine, not a specialized part, the positive as well as the negative elements, when we move alongside the reciprocating engine of government.

Again, putting a man in the accounting department does not make him any more honest than the rest of us. There is more logic in taking freight claims away from the traffic department than there is in placing them under the accounting department. The traffic man, the accounting man, or the legal man can settle or refuse a claim. None of these can eradicate its cause. Only the operating man can do this. Many roads cling to the belief that their wonderful interior combustion and hot air harmony give the operating department sufficient information to serve the practical purpose. My observation has been that this information is not sufficiently fresh; that it trails along too far behind the actual transaction. Some roads, like the Southern and the 'Frisco, have organized special bureaus in the operating department to minimize the causes of freight claims and to follow up discrepancies while the case is fresh; in other words, to investigate before the claim is filed. Sometimes this duplicates the work of the freight claim office and sometimes it does not.

So bad have been freight loss and damage conditions on most American railroads that almost any kind of attention has resulted in improvement. Nearly every road can cite figures in defense of its particular treatment of the situation. There are many good ways. In the absence of an absolute unit of comparison the best way must be largely a matter of opinion. To me the logical and practical principle has been discovered by two of the best managed railroads in the country, the Chicago & North-Western and the Chesapeake & Ohio. These roads, among others, place their freight claims under the operating department, thus reserving the hair of the dog for treatment of its bite. With such a system the general manager controls the disbursements to operating expenses for which he is responsible. Under other systems the general manager accepts charges which he does not directly control. Some roads have endeavored to correct this last defect by requiring claim vouchers to be signed by the general manager and the division superintendent. This beautiful example of circumlocution is expensive. There are only twenty-four hours in a day, and even claim papers can not be handled for nothing. Furthermore, the claimant himself refuses to see the beauty of delaying payment to carry out a theory. In some states he has secured

legislation penalizing railways for delay in settling intrastate claims. Can you blame him? The claimant aforesaid may happen to be a country merchant waiting for the way freight to come in. It brings him six boxes of groceries. In his presence, and that of the agent, the way freight brakeman drops and spoils a box. On many roads, not only is the agent not allowed to pay for this spoiled box, but is expected to require the indignant consignee to pay the freight on all six boxes before removing the other five. The consignee is told to file a claim, which then makes its weary round through the circumlocution office where clerks are called investigators. Such companies say in effect to the agent: "Yes, you are a good fellow; you get us a lot of business; you handle thousands of dollars of our money; you represent us in many things; you must understand, however, that a freight claim is a specialty requiring expert advice; a bad precedent might involve us in the future; you know, too, we might be criticised as opening the way to grafting by some other agents if we let you pay out money without authority from the accounting department; yes, we like your work and expect to promote you in the sweet by-and-by," etc., *ad nauseam*. Fortunately, these narrow views are giving place to more enlightened practices. On several railways in Texas most station agents are authorized to settle instanter certain classes of palpably just claims up to $20 or $25.

Among the practical advantages of claim control by the operating department are quicker recognition of lax methods causing claims, better discipline and morals of train and station forces, prompter settlement, and greater attention to seal records. The Chesapeake & Ohio makes surprise tests by breaking a seal and resealing the car with a different seal to see if the next man copies the last record, or actually takes his seal record from the car. This road also appeals to the human element. Claims settled are tentatively charged to the conductor or agent apparently at fault, and he is given an opportunity to explain. This is not real money, but a combination of Brown system, Christian Science coin, and 1907 clearing house certificates. The practical effect is very real, however. Each man learns to feel a responsibility which is reflected in a desire for a clean record. The general claim agent, who is under the general manager, sends monthly to each division superintendent a list showing the name of every freight conductor on the division, with number of claims, if any, charged to him on account of pilferage from train, rough handling, etc. The local divisions of the Order of Railway Conductors have been interested and feel some responsibility in keeping the work of their members upon a plane above the imputation of collusion with pilferage. Seek, my boy, to develop the higher natures of your men and you will be astonished at the response. Let them know that you know what they are doing, and it becomes easier for them to withstand temptation.

Freight claims are a fine example of an exaggerated specialty resulting in unnecessary centralization. The whole proposition can be decentralized for the good of the service. Because the division superintendent can not well settle interline claims of other divisions is no reason why his forces should not settle such local claims as concern his division.

A thorough study of freight claims will bring you early to a consideration of personal injury, stock and fire claims. The fad has been on many railroads to take these items of operating expenses away from their former location in the operating department and give them to the legal department. This exaggerated view of the laws of liability is partly responsible for the growth of the damage suit industry. It is another case of considering a part of the railway at the expense of the whole. We need legal advice and expert knowledge. The true function of the expert and the specialist is to see how much working knowledge he can impart to the layman for everyday use and reserve himself for the real complications which, if his tutelage has been sound, the layman will quickly recognize and bring back for expert assistance.

Not long ago I happened near a freight wreck. One of the cars in the ditch contained an emigrant outfit in charge of a man. This man was bruised, but not seriously injured. With the superintendent and the wreck train came a specialist, a claim adjuster for the legal department. He could settle only the personal injury. The damage to property was a freight claim and belonged to another department, the accounting, not formally represented at the impromptu function, and over which the superintendent as master of ceremonies had no jurisdiction. The various items of operating expenses involved on this occasion were in a decidedly diverged condition. What the spiritualist medium calls the control was in this case the office of a busy president some fifteen hundred miles away. Of course, the company spirit and common sense guided the superintendent, and he made the best of circumstances; perhaps risking criticism and censure for crossing sacred departmental lines. What do you think of a system that breaks down in emergencies? Is not an emergency a test of a system, a proof of its elasticity? Can we develop the highest efficiency of superintendents when we, the executive and general officers, place upon them the burden of departing from a system that fails to meet their practical problems? Is it not a species of unconscious administrative cowardice for boards of directors to impose implied and practical responsibility without conferring corresponding authority? Can such questions be ignored as exceptional, trifling, and captious? Do they not reach to the heart of railway organization and efficiency? Will the railways correct such errors themselves, or will they await once more the remedy by legislatures and commissions?

If a study of conditions does not convince you theoretically that one claim bureau should handle freight, stock, fire, and personal injury claims—in short all claims covering injuries to persons and damages to property—go down on the Chesapeake & Ohio and watch them do it practically.

Instead of several specialists duplicating each other's itineraries, you will find some all-round claim men doing a variety of practical stunts. When they do strike a really different and highly technical case, they utilize the services of their best specialist in that particular line, not infrequently the general claim agent himself. Overcharge claims are very properly handled under their traffic auditor, being a matter of correction and not of operating disbursement. Were it up to me, I would make the general claim agent an assistant general manager, so that in claim matters he would have rank and authority superior to the division superintendent's. The division claim agent I would make an assistant superintendent, so that in claim matters he would have rank and authority superior to all employes on the division.

On this last division feature I once convinced my old friend, Cant B. Dunn, by a long, practical test.

Affectionately, your own,

D. A. D.

LETTER VII.

THE CHIEF OF STAFF IDEA.

San Antonio, Texas, May 20, 1911.

My Dear Boy:—Let me tell you something about a wonderfully effective human machine, the Confederate Army. I sit facing a Confederate monument which depicts a self-reliant son of the Southland, the type of man real railway training helps to perpetuate. Hard by is a shrine to valor, the Alamo, a reminder of the duty of altruism which an individual owes to his fellows.

Fifty years ago two great armies were organized to fight to a practical, working conclusion some of the indefinite compromises of the Federal Constitution. Each army was supported by the intelligent spirit of an aroused people. Each sought in its organization and operation to give the most effective expression to that spirit. Jefferson Davis and his advisers sought to profit by the experience of the old United States Army and to avoid inherent weaknesses in its organization. So the Confederate Congress created the grades of general and of lieutenant general, in order that a general might command a separate field army, a lieutenant general a corps, a major general a division, and a brigadier general a brigade. By thus more exactly defining official status, jealousies were minimized. Until Grant was made lieutenant general in 1864, the Federal Army had only two grades of general officers, major general and brigadier general. This led to confusion, to bickerings, and to petty jealousies. Since a major general might command such distinct and self-contained units of organization as a division, a corps, or a separate field army, numerous special assignments by the President became necessary.

The Confederate Army had another feature of organization that was epoch-making. Samuel Cooper had been adjutant general of the United States Army, with the rank of brigadier general, issuing orders over his own signature from Washington "by command of" somebody else—Brevet Lieutenant General Scott or the Secretary of War. Because of his acknowledged efficiency in office work and administrative routine, Samuel Cooper was made adjutant general and inspector general of the Confederate Army. Did they give him the rank of brigadier general? No, sir; they made him a full general, and number one on the list, senior to Albert Sidney Johnston, Robert E. Lee, Joseph E. Johnston and G. T. Beauregard, who, as generals at one time or another, commanded separate field armies or territorial military departments. General Cooper at a desk in Richmond was the ranking officer of the Confederate Army. This detracted not one iota from the fame of Lee, the great soldier and the first gentleman of the South. On the contrary, the increased efficiency due to receiving instructions from a real superior, not under-strappers or chief clerks, made greater the reputation of Lee. From one viewpoint General Cooper was a high-class chief clerk for his President and the Secretary of War. From a broader view he was their technically trained, highly efficient chief of staff.

The Confederate Army gave in effect, but not in name, the chief of staff idea to the world as a great object lesson in the applied science of organization. Historians say that Jefferson Davis, himself a graduate of West Point, a veteran of the Mexican war, and Secretary of War in the cabinet of Pierce, meddled too much in military affairs when as President he should have been attending also to civil affairs. Be that as it may, the organization was elastic enough to meet just such variations of personal equation. Whether the President, the Secretary of War or the adjutant general (chief of staff) acted in a particular case, the subordinate knew who took the responsibility and that the action came from a real superior in rank.

The Confederacy fell. The passions of the time, the shortsightedness of prejudice, precluded the adoption at that time by the United States of any feature of the Confederate organization, however meritorious in principle and practice. It remained for the Germans, already applying the idea, to dazzle the world in 1870 and conquer France by the work of their general staff and its able chief, von Moltke. Not until after the costly lessons of the little war with Spain in 1898 did our Congress wake up and give the United States Army a general staff and a chief of staff. The new law includes several desirable features of elasticity. Among these is a provision for the selection by each administration of its own chief of staff. A permanent chief of staff might be an obstructionist or might become too perfunctory in compliance. The law wisely limits the selection of a chief of staff to about twenty general officers. This prevents playing untrained favorites. It permits any passenger conductor to be made superintendent, but forbids selecting an extra brakeman or the call boy. Furthermore, if conditions change or a new administration arrives, the chief of staff is not penalized for efficiency by losing out entirely, but reverts to his permanent status; the superintendent holds his rights as a conductor and bids in a good run according to his permanent seniority. This feature of good organization, the conferring of definite local superior rank, and the protection of the incumbent from unnecessary degradation, was discovered centuries ago by another effective institution, the Catholic church.

Life is a composite. The Army, like several railways, has been waking up to the fact that a lesson can be learned from the civil courts. A large city may have several courts and judges. A judge may sit for one term in the equity court, then in the criminal branch, and next in a court *en banc*. All the time there is only one office of record, one clerk of the court, with as many deputies as may be found necessary. When one judge wishes to know what another judge has done, the former does not write the latter a letter to inquire, but sends to the clerk's office and gets the complete record up to date.

Are the railroads above copying sound working principles of efficiency from such tried institutions as the Army, the Navy, the civil courts and the churches? Certainly not, as some roads are showing in a highly practical way. Such movements as these are but expressions of a cosmic tendency, greater and more powerful than any one branch of human activity. Such trends of progress are noted by observers who happen to be favored with a view from the watch towers and who are able to make suitable adaptations because they realize that ideas are greater than men, that practical devices are greater than their inventors.

Sound ideas often depend for their development and permanency as working practices upon some great exponent of acknowledged capacity for leadership. In 1870 Bismarck had baited on the French and von Moltke had planned their discomfiture. In 1870 General Robert E. Lee, entering upon the last year of his life, was president of Washington and Lee University at Lexington, Virginia, where Colonel Allan, of Stonewall Jackson's staff, was a prominent professor. There came to sit at the feet of these great teachers a mere boy in years, but an adult in intellectual grasp. This callow youth was of German lineage, but born and reared in New Orleans, a city stamped with the civilization of the French. Perhaps this modest youngster dreamed that twenty years later he would be a great railroad engineer—hardly, though, that in forty years he would, as a great railway operating man, be called the von Moltke of transportation. Strange, indeed, that this von Moltke, Julius Kruttschnitt, should find his opportunity for highest development under the Napoleon of our profession, Edward H. Harriman, himself among the last of the feudal railway barons. Stranger still that as this Napoleon was passing his von Moltke was starting the railways away from feudalism in interior administration by introducing within the latter's own sphere the chief of staff idea of the Confederate, the German, and the American armies. For, my boy, the unit system of organization on the Harriman Lines, of which you have read more or less, is primarily a substitution of the modern chief of staff idea for the outgrown, dwarfing, irrational government by chief clerks.[1]

The unit system of organization requires that an official, whether the head of the unit or an assistant, shall, when absent on the line, be represented at headquarters by the senior or chief assistant of the unit. Such senior or chief assistant is in effect, though not in name, the chief of staff. Normally, this senior is number one on the list of assistants, but whoever is so acting becomes, as above explained, the senior for the time being, and when relieved reverts to his permanent place on the list. Rotation for this chief of staff depends largely on the personal equation of the head of the unit and of his various assistants. In the last two years some divisions have not rotated the chief of staff at all. One superintendent who credits the system with increased supervision and notable decreases in expenses is now rotating his assistants in the senior chair every two weeks.

There are diverse views on the subject of rotation in general. My own opinion is that it may or may not be desirable. I incline rather to rotation because it seems to be a biological concomitant of rational evolution. Nature rotates her seasons and her types. Where, as in the tropics, there is less rotation we find more stagnation and quicker death. Many soils are impoverished by neglect of proper crop rotation. The other day in a terminal, I found a superintendent lately rotated, like a Methodist minister, from another division. Favored with a fresh viewpoint, he was having switch engines give trains a start out of the yard, and was taking off a helper engine which for years had seemed an unavoidable expense. For what was in this particular instance a case of over-specialization he was substituting engines which could more economically perform the dual functions of switching and of pushing.

Speaking of yards, see if you have not some bright fellows on your staff who can figure out a car record that can be taken by the mechanical men, the car inspectors, that will answer all the purposes of transportation, including claims. Instead of two sets of specialists, car inspectors and yard clerks, partly duplicating each other's work, see if you cannot develop one set of all 'round men with some interchangeability of function. No, you cannot do it all at once. Even if you have a workable scheme it will take a long time to establish. The Brown system of discipline required nearly twenty years for its complete extension to practically all American railroads, although in successful operation for nearly a hundred years at the United States Military Academy at West Point. The demerit system is better handled at West Point than is the Brown system on railways. This is because most of the officers are relatively better trained than railroad officials, having all been through the mill themselves. Better training cultivates the judicial quality. Too often the number of Brownies does not depend upon a fixed scale for a like offense, but rather upon how mad the superintendent is or on how hard he has been pounded by the typewriter in the offices above.

Before you condemn any system be certain that its apparent shortcomings are not the fault of

your own interpretation and administration. We used to speak of engine failures alone. Nowadays we distinguish as between engine failures and man failures. Likewise there is a difference between a system failure and a man failure.

Affectionately, your own,

D. A. D.

[1] See appendix for a description of the unit system of organization.

LETTER VIII.

THE UNIT SYSTEM.

Galveston, Texas, May 27, 1911.

My Dear Boy:—We were talking of the unit system of organization. There is little that is new about the system. Like many useful things in this world, it is mainly an adaptation of some very old principles and practices. From one viewpoint it is a rational extension of the simple principles of train dispatching. The standard code does not attempt to supply the place of judgment in a train dispatcher. It does not tell him when to put out a meet or a wait order. When his judgment dictates the necessity for any particular action, the standard code comes into play by prescribing forms, by imposing checks and safeguards, by simplifying methods, and by unifying practices. This gives greater opportunity for initiative and originality on the part of the dispatcher by making routine the detailed portion of the process. He has more time to think.

Because the unit system leaves so much to the thinking capacity of the men below, some people have found it difficult to understand. Many codes of organization attempt to cover in advance all the various cases that may come up. The unit system enunciates principles and prescribes methods, but leaves independence of action to the man on the ground. He is for the time being the judge as to what principle to apply. When men are carefully trained their first impulse is to do the right thing. This impulse has been dwarfed and deadened on many railroads by artificial restraints which make a man doubtful of his authority. The unit system reverses some old presumptions and puts the burden of doubt upon him who questions the official authority.

We have to take human nature as we find it, not as we think it should be. The master mechanic or the division engineer is riding on the rear of a train, at the company's expense, and tells a young flagman that the latter did not go back far enough. If the flagman does not tell the official to go to h——, the trainmaster probably will. The trainmaster says, "This is *my* department, you have interfered with *my* man." That is the old feudal conception. He is not *my* man but the company's for service, and his own for individuality and citizenship. Let the master mechanic or the division engineer of many years' service report the flagman whose tenure may have been very brief. Human nature is such that the trainmaster, stung by an implied reflection, constitutes himself attorney for the defense. The papers grind through the baskets of the chief clerks. By and by, when everybody concerned has forgotten the incident, the papers come back with assurances of distinguished consideration and politely intimate that the case was not quite as bad as represented. The old official, in a measure discredited, soon stops concerning himself with flagmen. The management, the stockholders, and the public lose just so much possible protection through increased supervision. The salary and the expense account of the traveling official go on just the same.

On the Harriman Lines the master mechanic, like the division engineer, has the rank, title, and authority of assistant superintendent. Mind you, it is not assistant superintendent in charge of thus and so, but just assistant superintendent. An attempt to define duties in a circular of appointment might imply that all the responsibilities not enumerated would be necessarily excluded. So the assistant superintendent quietly speaks to the young flagman, who profits by the instruction, and the incident is closed without recourse to the typewriter. For the technical brief to the Supreme Court there is substituted the rough and ready but surer justice of the police magistrate. The employe still has the right to appeal just as he had before, but seldom or never does he exercise it. There are, of course, intelligent limitations to all authority. The mechanical assistant, or the maintenance assistant should not, for example, order the flagman to buy a new uniform. Common sense and courtesy have proved effectual safeguards against abuse of authority.

The underlying principle that responsibility breeds conservatism in action has operated to prevent those unseemly clashes of authority which many predicted. The good sense of the superintendents has served as an effectual balance wheel to maintain smooth running. The unit system does not deny or dispute the necessity for specialized talent for technical activities. It insists, however, that increased supervision of the countless phases of operation can be gained by utilizing all the official talent available. In many cases such increased supervision is a by-product. The maintenance assistant is inspecting track. The train stops. He cannot resume track inspection until the train starts. Meantime, he may be able to find time to see if the conductor receives his orders promptly, if the dispatcher uses good judgment, if the station forces are alert, if the public are being well handled, if the news butcher has his wares over several needed seats in the smoking car. He may even go to the head end and tell the eagle eye how the black smoke indicates that the fire boy could save his own back and the company's good money by less liberal use of the shovel. Anything very technical requiring the presence of specialists for all these

things? Of course, if a special problem develops, such as a badly adjusted draft, it may be necessary later to get the more expert attention of a mechanical assistant. Often, however, before this stage is reached there can be rendered much economical first aid to injured operating expenses. This increased supervision, be it much or little, is clear gain for the company. It means more effort for the official, but that is what he is paid for. It is usually better in zero weather to have the old master mechanic and the old traveling engineer as assistant superintendents riding different trains on the road than to have them sitting in a comfortable office writing letters to each other about engines that failed last week or last month.

Once upon a time a traveling engineer talked through a telegraphone to a dispatcher. The latter requested the former to have the freight train pull into clear to let another train by. The conductor was not in sight. He was probably in the caboose making out some of those imaginary reports about which grievance committees tell us and which are most in evidence during investigations of head-end collisions. So, this member of the ancient and honorable order of attorneys for the brotherhood told the brakemen where to head in. Whereupon with much professional profanity the trainmen declined, saying that no traveling engineer could tell them what to do. The superintendent took the brakemen out of service. They got back only on request of the traveling engineer to whom they apologized. While authority was vindicated, an undesirable situation had been developed. No matter how emphatic the vindication may be, it is as bad for discipline to have authority questioned as for a woman to have her virtue impugned. Since then the unit system on that division has made the traveling engineer an assistant superintendent, and the question of authority does not arise.

Out in that part of the country a fast train was pulling out of a terminal. The trainmaster was out on the road. His clerk signed the trainmaster's name to a message, telling the old passenger conductor to make a stop to deliver what to the clerk was an important letter, ran down and handed both to the conductor. The latter demurred, saying that under his running orders the stop would make him miss a meeting point. The clerk insisted and when the conductor disregarded the message the latter was taken out of service. This was done on the old feudal theory that the trainmaster's name and position must be respected. By the same reasoning a bank teller should honor a check on which he knows the signature is forged. Since then the unit system on that division requires everyone to do business in his own name. Employes obey the instructions of men shown by name on the time card, and are not at the mercy of clerks. The old trainmaster's name is more respected because it is signed only by himself and is not cheapened by use by Tom, Dick and Harry. (Anvil chorus: "Such things couldn't happen on our road." Perhaps not, but they do just the same, in a greater or less degree.)

When a conductor reports for train orders he has a right to know that a competent dispatcher is on duty. He cannot dictate, however, what particular dispatcher shall work the trick and give him his orders. The unit system carries this same principle to correspondence and reports. It denies the right of the employe to dictate what official shall handle a certain letter or report, under normal conditions. The report is addressed impersonally "Assistant Superintendent," and the office decides what official is most available. As a matter of common sense the expert in that line will be utilized. In his absence, however, his feudal representative, a clerk, will not act for him. The clerk may prepare the papers, but final action can be taken only by an official. Highly technical problems are sent to the absent official on the road or await his return. Each assistant may issue instructions, in his own name, to such subordinates on his own pay roll as roadmasters under the maintenance assistant, foremen under the mechanical assistant, yardmasters under the transportation assistant, etc., etc. Before these instructions leave the office, they should pass, like all correspondence, over the desk of the senior assistant (chief of staff) for his information and for the prevention of possible conflict and confusion. Here, again, is a principle of train dispatching. All orders concerning the running of trains go over the dispatcher's table. Should there not be a similar check imposed on official instructions and information imparted to hundreds of delicate, sensitive, human machines, made in the image of God?

Why are not communications and reports addressed "Superintendent?" Because there would be an implied obligation for the superintendent to act. This obligation cannot be admitted under normal conditions. Therefore, to be honest and straightforward, the address is "Assistant Superintendent." Under this system the employe knows that some assistant will see his communication, not the clerk of somebody else. If the employe desires a particular official to see his communication, he makes it personal by prefixing that official's name.

Any employe can address the superintendent by name for the same good reason that the humblest citizen can appear in his own behalf in any court in the land. Though the court is open, neither the citizen nor his attorney can normally dictate what judge shall hear his case. Authority is abstract and impersonal. The court exists if the judge is dead. The exercise of authority is concrete and highly personal. The court is silent until the judge speaks. Conversely, the superintendent as the head of the unit may address any employe direct without going through the assistant on whose payroll the employe is carried. Common sense and the personal equation of the officials concerned indicate how far this elastic feature can be carried. Courtesy requires prompt notification of the assistant concerned. Officials have superiors, and to attempt to convey the idea that each is a feudal chief, when in reality he is not, can result only in self-deception. The practice of each division superintendent reissuing verbatim in his own name instruction circulars

from the office of the superintendent of transportation is misleading and ridiculous.

All instructions from general officers, including the general manager, should come to employes through the superintendent's office, not only to respect the integrity of the organization unit, but to preserve a history of the transaction in the authorized office of record—to get all the runs, including the general manager's special, on the right train sheet as it were. Whoever acts, whether the superintendent himself or an assistant, has at hand in one office of record full information for his guidance. You understand that the superintendent is boss. He may see any or all communications from employes as he thinks fit. Where previously he instructed his chief clerk what to bring to him personally, such instruction he now gives to his chief of staff. An employe who addressed "Assistant Superintendent" may receive a reply signed by the superintendent himself. This is an honest record, not a subterfuge. Some assistant, the chief of staff, has handled the paper as well as the superintendent himself. To the subordinate the superintendent is normally an incidental representative of authority entitled to the greater respect to be given his higher rank. To the general offices, and to co-ordinate units, the superintendent is an essential head of a component unit who must not be ignored. Therefore, since there is an implied obligation for the superintendent to answer superior authority himself, all communications from superior and co-ordinate authority are addressed impersonally, "Superintendent." A railway is so extensive that the superintendent should spend at least half the time out on his division. In his absence the chief of staff is allowed to communicate with the general offices and other divisions in his own name, but "for the superintendent." The superintendent may answer from the road himself, but in any case the general offices know who has really taken action. Going down on the division any assistant may sign, subject to review by the chief of staff. Going up to higher authority only the superintendent or his chief of staff may sign. The rights of the individual assistants are preserved by permitting any one to go on record to the general offices when he so desires. He writes his letter, addresses it "Assistant Superintendent," and takes it to either the superintendent or chief of staff and requests that it be forwarded. In this exceptional case a letter of transmittal is written setting forth the views of the superintendent. A cat may look at a king. A meritorious idea should not be throttled because it does not happen to appeal to the next superior.

When a division official on any road rides a train, he does not first thing try to tell the conductor what meeting points should be made. He usually says, "Let me see your orders," which is in effect asking the conductor what the dispatcher has said must be done. Protected by this vital information the official may then venture some suggestions. In the preliminary lecture explaining the unwritten laws of the unit system the new assistant superintendents are cautioned to apply the same principle. They are not to see how much trouble they can make, but how little. If the transportation assistant, for example, pulls up to a water tank at 7:20 a.m. and sees the section men just going to work, he does not jump on the foreman for being late, but quietly asks, "What are your working hours? What time does the roadmaster tell you to begin work?" The moral effect of the presence of an alert, observing official, armed with sufficient authority, becomes an asset of value to the stockholders. We have not enough officials to ride every train and cover every point. The more open, intelligent supervision we can get from each official the better should be the operation. Of course, if the officials were not experienced railway men a condition of nagging and rawhiding might result which would prove fatal. What the unit system does is to try to make potential the latent knowledge and ability which every official possesses in a greater or less degree. The old over-specialized system denies that this stored-up reserve exists to any practicable extent.

The fact that the title of assistant superintendent is uniform tends to bring out the real individuality of the different assistants. Each has to have his name on the door of his private office. As we hear less and less of "my department" and more and more of "this division," the references to "the trainmaster," "the master mechanic," etc., etc., give way to "Mr. A.," "Mr. B.," etc. The assistant superintendents have definite seniority, and when two or more come together under circumstances rendering it necessary, as at a wreck, the senior present takes charge and becomes responsible. Remember that rank and authority can be conferred by seniority in grade as well as by grade itself.

The scriptural warning that no man can serve two masters is still applicable. In our case the master is the corporation, represented at different times by various individuals clothed with authority. The conductor runs his train under the laws of the land, the policy of the president, the rules of the general manager, the bulletins of the superintendent, the assignment of an assistant superintendent, the orders of a dispatcher. He collects tickets and fares as directed by the general passenger agent and reports on forms prescribed by the auditor. The lower we go in the scale the fewer the superiors with whose instructions the employe comes in direct contact. The trackman knows authority only as its exercise is personified by his section foreman until the paymaster tells him to wipe off his feet before entering to receive his check. Therefore, put out a slow flag against too fast running over such low joints as "one boss," "complete responsibility," "divided authority," etc., etc., until you feel certain just what speed they will stand.

Affectionately, your own,

D. A. D.

LETTER IX.

STANDARDIZING OFFICE FILES.

Chicago, June 3, 1911.

My Dear Boy:—It has doubtless occurred to you how worthless as evidence are many of the office files. How can any one tell a year afterward whether the general manager or the superintendent ever saw the telegram on which his name is typewritten? On most roads any one of a half dozen or a dozen people may have dictated the message. How much better, as under the unit system, to have every man doing business in his own name! He can then supplement the written record with much more intelligent recollection of events related to the transaction. We dictate the most important telegrams, which pass unquestioned, without an autograph signature. This is common sense and just as it should be. When an unimportant letter is written somebody has to get out a pen and sign some name or other. How inconsistent! Why not, for certain kinds of correspondence, let the stenographer typewrite the name of the dictating or signing official, and then authenticate with the office dating stamp or a private seal mark? The office dating stamp should be kept under lock and key in official custody in order that it may be used for authentication, like the seal of a notary public. To save the labor of constant signing I predict that some time we may go back to individual personal seals carried on a finger ring or a watch fob. That is the way they authenticated documents at a time when the gentry felt themselves above learning to read and write.

If you have occasion to dictate a message over the telephone from your house at midnight, do not let the operator imitate your autograph signature, but have him print your name with a pen, pencil or typewriter. Also, take good care to have such messages sent to you afterward for you to check. Your time is valuable, but it cannot be put to better use for the company than in insuring the integrity of your individual transactions. It may be that no record whatever is necessary. With all our craze for accumulating files we do not record many telephone conversations. You must be the judge as to whether a record for your office is necessary, and in such exceptional cases state your wishes at the time. The farther down the employe the more zealous is he to escape possible censure by preserving unnecessary information. What we need is one complete record of a transaction rather than so many partial records. Many of the telegrams sent from a superintendent's office should, after sending, go to the main file room for consolidation with related papers under a subjective classification. It is more logical to file certain classes of messages by days in date order. For example, messages relating to train movements should usually be filed in date order since they are supplementary to the train sheets of that particular day, and the date would be the determining factor in tracing the transaction afterward. These two distinct classes of messages should be filed, the one under a subjective classification, the other under a serial classification. The good, old-fashioned way of rolling together all the messages of the day and cording them in a pile on the top shelf was all right in the day of wood-burners, but falls short in this day of higher pressures. Remember, too, that the telegraph office is a part of the same establishment. Wherefore, make a carbon copy of every telegram that is going down the hall to be transmitted.

If you wish to get real busy and cultivate patience, try to introduce a uniform filing system in all the offices on the road. Every fellow will tell you that the system in his office is best. The acid test is: "Will your system fit the president's office?" and the stereotyped reply is, "You see we are very different. Our local conditions are peculiar." So it falls out that when the agent writes his superintendent about office furniture, for example, the agent, if it is a big station, gives the subject a file number. The superintendent gives it a second number. If perchance the general superintendent, the purchasing agent, the general storekeeper, the general manager, and the president should happen to get hold of the papers, each office would affix a different number. You might have on the same railroad as many as seven different file numbers for the same subject. Remember that all filing systems are arbitrary. Whether you designate office furniture as seven, eleven, twenty-three, or forty-four, it rests in the breast of somebody to say what that designation shall be. It is like numbering trains, cars and locomotives, we take some arbitrary basis from which we build up a logical classification. Formerly, trains, cars and locomotives were given serial numbers in the order of creation. So were letters in an office. Now the proposition is too big and we assign series of numbers for classifications which are more or less self-suggesting. Any number of men have tried to work out a filing system based on the Interstate Commerce Commission classification of accounts. Any number of men have soon encountered limiting conditions which seem to preclude a satisfactory solution.

If you had time, I do not doubt your ability to work out the best kind of a filing system, but you have not the time. If you had lived before George Stephenson you might have invented the locomotive, but George beat us all to it. If you had time you could work out a table of logarithms,

or a table of trigonometric functions. Life is so short that it is better to use the tables that other people have prepared. By the same token, if I were you, I would save my company money by adopting Williams' Railroad Classification. It is an expansive, but not expensive, decimal system suitable for everybody from the station agent to the president. Among the roads that have taken it seriously are the Baltimore & Ohio, the Delaware & Hudson, the Pennsylvania, and the Harriman Lines, not such a puny lot. Others say of it as of the unit system of organization: "We are watching its development with much interest." In either case, if the stockholders and directors are complacent, you and I have no kick coming as to the number of years over which this inactive watchfulness may extend.

The manifest advantages of a uniform filing classification are the time saved in avoiding duplication of numbers, and the practical familiarity possible to officials and employes of all grades and locations. When a man is promoted or transferred, he does not have to learn a new filing system. Instead of the whole burden of filing being upon a file clerk, everybody can be helping to preserve the integrity and insure the efficiency of the system. It is not necessary to sit up nights and memorize filing numbers. Take the matter seriously, and in a short time you will unconsciously absorb the most important numbers, just as you get trains, cars, and locomotives in your head. Officials frequently have a disproportionate and exaggerated sense of the value of their own time. They are paid to think from their presumably wider understanding. If the official by one minute's thought can dictate the file number and later on save several hours of search in the file room, it is his duty to do so. All over the country file clerks tell me their troubles. The burden is, "If you will get the officials to respect the files as much as we respect the officials, it will all be easy." You know, my boy, that there are a whole lot of things that deserve to be taken just as seriously as we take ourselves. Consider this standard code of train rules again. With all its defects and shortcomings it is a vital force. Because it is standard it gains a respect as a result of lifelong drill and discipline of employes, regardless of changes in location or assignment. Therefore, standardize your files, and interest your officials. Rank imposes obligation, or *noblesse oblige*, as the French say.

It is a much easier matter to start a new filing system than is generally supposed. Just begin. It is not necessary to renumber the old files. Give new numbers to all the old stuff that comes in, and in a month or two you will probably absorb nearly all that is of current interest. Then store the remainder of the old stuff as a dead file under the old system. Most of the old you will never need, but if you do, as occasion arises, locate under the old system and transfer to the new.

If you are putting up a new office building or re-arranging an old one, try and locate the main file room next to the telegraph office. Or put one over the other so that quick communication can be made by some such device as a chute, dumb waiter, or pneumatic tube. Telegrams received can then be hurried to the file room and related papers attached, when desirable, without taking the valuable time of an official to send to the file room for them. Here is a place for a really rational conservation of official time. The effect of effort should be in proportion to its intelligence and intensity rather than to its amount.

Experts long ago established the fact by time studies, and otherwise, that flat, vertical filing cases are the most efficient and economical. There are a number of satisfactory makes on the market. Like selecting a typewriter, it is largely a matter of personal preferment. The way to beat another man at his own game is first to sit in, play and learn. Gamblers would become extinct if all men lived up to this advice. Most railway officials regard organization as an exception to this precept because, as I said before, nearly every man flatters himself that he is a born organizer. Before you raise the stakes too high in trying to beat another man's game of organization, better first sit in and play it his way.

Do not be afraid to trust outlying offices, like those of your superintendents, to run their own files. Have them inspected as often as may be necessary to insure uniformity and efficiency. Do not forbid their adding numbers as emergencies arise. Assemble these new subjects periodically, say once in six months, for standardization, and amplify the working numbers if necessary. You must allow for differences in the human equation. Some men are strict constructionists, and some are broader. Some men classify under a few subjects, while others subdivide to a greater degree. You know the old story of the man who was indexing and feared that something might be overlooked. So under the caption, "God," he put the cross reference, "See Almighty God." Without a retrospective study of actual performance you cannot well say just how many sub-numbers shall be used in a given office, any more than you can determine in advance how many train orders a certain dispatcher should put out under the standard code. Among the advantages of using a card index for running a file is that by counting the live cards we know the number of subjects in actual use. This is not inconsistent with book numbers, the book then being used as a reference encyclopedia from which subjects are entered on cards as fast as each necessity arises.

Remember that while immutable principles must eventually triumph over local conditions, much depends upon considerate application. The local condition didn't just happen, but had its origin in some reason, good or bad, perhaps once convincing but now outgrown. Sometimes the reason is so vital as to be a principle in itself. In our beloved Southland there are local conditions of society which do not obtain elsewhere in this country. True Southerners thank God that human slavery has been abolished. They are striving earnestly and successfully to adjust conditions created in

the birth pangs of a social revolution. Well managed railroads like the Louisville & Nashville adjust their working policies to these basic conditions. Nearly a decade ago Samuel Spencer, as president, felt that the Southern Railway needed an infusion of new operating blood and a rotation of types, both excellent things in themselves, but, as experience showed, easily overdone and carried to an irrational degree. With native talent at hand for the developing he imported to the proud old civilization of his birth some rough and ready brethren of the western prairies. These earnest men and their followers knew how better than they knew why. They were long on art, but short on science. Demoralization and wrecks, attributed to inadequate facilities, cost the road much public confidence, cost the stockholders hundreds of thousands of dollars, and finally, in an awful tragedy, cost the able president his useful and honored life. Fate accorded to outraged sociology and her smaller sister, organization, terrible and undeserved retribution. For, barring this one mistaken policy, Samuel Spencer was an earnest patriot and a constructive railway statesman. As a youth he served in the Confederate army. Through life devotion to his flag was a passion. As a man and a gentleman his character was unblemished, his integrity was stainless. Peace to his ashes. Success to the Southern. Its great traffic strength, actual and potential, rests on the broad foundations laid by Samuel Spencer. Prosperity to the railroads. By constant search for the lessons of human efficiency to be drawn from such experiences as these, they prove their broad claim to scientific management.

Affectionately, your own,

D. A. D.

LETTER X.

THE LINE AND THE STAFF.

Chicago, June 10, 1911.

My Dear Boy:—You have asked me to tell you something about line and staff. The term line is used to indicate the direct sequence toward the active purpose of the organization. The line officer exercises a direct authority over men and things. He is the incarnation of administrative action. The staff is supplementary to the line as equity is supplementary to law. The staff officer is the playwright. The line officer is the actor. The actor is usually too much absorbed with the technique of his art to write new plays. The line officer, as such, seldom originates new methods, because he is too close to his everyday problems of administration to cultivate perspective. The ideal staff officer has had experience in the line.

The line with a railroad—its fighting force, so to speak—is the operating department. Because they are staff departments the offices of the other three, namely, accounting, traffic, and executive, legal and financial, can close from Saturday noon until Monday morning. The operating department, being the line, keeps the road open and the trains moving. Because of the poverty of our language, we now encounter some difficulties of expression in explaining all the various ramifications of line and staff. A staff department, because of its size, may exercise line functions within its own interior administration. Thus, the auditor organizes his office forces under appropriate chief and subordinate officers who, within the accounting department itself, exercise the authority of line officers. When such accounting officers get outside their legitimate sphere and endeavor to act as line officers in the operating department, expensive friction begins. This feature I shall discuss with you later. Suffice it to say that at present the hardest of all problems is to keep line and staff in economical balance. Staff departments then may within themselves exercise line functions. This grows rather from necessities imposed by size than from inherent nature of function. The first staff officer was an adviser and exercised no authority, except that of polite inquiry, because there was no one whom he could properly command. So the line, the operating department, soon grows so big as to require staff officers within itself, people who have time to think out improvements because they are not burdened with administrative responsibilities.

Hold tightly to this thought, my boy. The plane of differentiation between line and staff usually follows a cleavage based upon size rather than upon relative importance of function. The first line officer needed no staff, because he had time to think as well as act for himself. The first superintendent looked after the repairmen himself. The first master mechanic came into being not because he was so different from everybody else, but because the superintendent had become too busy to do it all himself. By and by the master mechanic forgot this basic fact and, unconsciously exaggerating his own specialty, began to feel that the railway is incident to shops and equipment rather than shops and equipment incident to the railway. The last five years have witnessed a decided improvement in this undesirable condition. Just at present the store department Indians are the tribe most in need of being rounded up on the operating department reservation for eye wash and vaccination against distorted perspective.

The operating department of a railroad is, or should be, a real department, complete and self-contained. It consists of such important component elements or branches as maintenance of way and structures, maintenance of equipment, transportation, telegraph, signals, stores, purchases, dining cars, etc. Let us not waste any time discussing the relative importance of these components. Æsop centuries ago did that better than we can. His fable of the quarrel among the organs of the human body teaches us that while all are important each is useless without the others.

Individually the general superintendent, the chief engineers, the superintendent of motive power, the superintendent of transportation, the superintendent of telegraph, the general storekeeper, and the superintendent of dining cars, are line officers exercising direct authority in a defined sequence. Collectively they constitute, for consultation, the general manager's staff. When all have the rank and title of assistant general manager, this duality of function is the more pronounced and valuable. For the feudal notion of unbalanced components is substituted the cabinet idea of comprehensive deliberation, unified administration and devotion to a common purpose. (Anvil chorus: "It's that way on our road now.") Perhaps so, but if so, what assurance have your stockholders and the public that the same happy condition will obtain ten years hence? Each head of the nine executive departments in Washington is a line officer running his own department. At the President's cabinet table he becomes a staff officer deliberating upon the problems of all. The attorney-general should be called secretary of law, and the postmaster-general secretary of posts. Then all nine would have the uniform title of secretary. The position of

secretary to the president, an assistant *to* proposition, should be abolished—usually I prefer the gentler expression, "title discontinued." His duties should be performed by the secretary of state, who is always the ranking member of the cabinet. In the first cabinet, that of George Washington, the secretary of state, Thomas Jefferson, was in effect, though not in name, prime minister and chief of staff. Foreign affairs, then an incidental feature, are now so extensive for a world power that we should have another department under a secretary of foreign affairs, leaving the secretary of state as senior to be the able righthand man of the president. Here again the size of the proposition, the volume of business, is the proper determining factor.

On a small railway the chief engineer as a line officer may be able to do all the engineering himself. As the business grows he requires such special staff advisers as an office engineer, a locating engineer, a bridge engineer, a tunnel engineer, a signal engineer, etc. Some roads make such engineers line officers by giving them extensive authority over working forces. Usually I believe this is a mistake. It seems better for these engineers to be real staff officers, thinking, inspecting, warning, instructing (in the sense of lecturing), improving, designing and perhaps sometimes installing, but never directly operating or maintaining. The same general reasoning applies to the mechanical bureau when the business of the chief mechanical officer attains a volume necessitating the help of such valuable staff officers as a mechanical engineer, an electrical engineer, a testing engineer, etc.

When the telegraph came to supplement the railway, men stood in awe of its invisible effects. Soon the telegraph man said in effect, "This is a wonderful and mysterious specialty which you fellows cannot understand. Let me, the expert, handle it for you." So he segregated unto himself a so-called department on the plea that it is so different. By and by the division superintendents woke up to find their telegraph hands tied. Appeals to the general superintendent or general manager proved fruitless. So the division linemen usually report directly to the superintendent of telegraph. They often stay around division headquarters until the chief dispatcher is able to jar them loose and get them out on the road. Then they go to the scene of trouble, look wise and get the section foreman to dig the hole and do most of the work. Why not, therefore, hold the section foreman responsible for ordinary wire repairs in the first place? Let every section house have a pair of climbers, a wire cutter and pliers with whatever simple outfit may be necessary. If unusual troubles develop or a line is to be rebuilt send the most expert help available, but while on the division let such help be under the authority of the superintendent. We need an expert at the top as chief telegraph and telephone officer to tell us all how to do it. The volume of business will usually warrant making him a line officer with the rank and title of assistant general manager. He should not deal directly with operators and linemen any more than a general superintendent under normal conditions should instruct an individual conductor or a chief engineer communicate direct with a section foreman. The integrity of the division as an operating unit should be respected.

By and by the signals followed the telegraph. Once more the management allowed the specialist to put it over at the expense of the good old wheel horses in the regular line organization. The embryo signal engineer said, "This wonderful and mysterious development is really something different this time. It is absurd to suppose these stupid old section foremen can learn anything about electricity." So the signal engineer was allowed to build up a new department. He went out on the ranches or in the barber shops and hired signal maintainers. A new department is liberally treated because its activities are a fad for the time being. These signal maintainers in a few months absorb so much magnetism from the field of the signal engineer that they are qualified experts to whom the rest of us must not say anything. They have easier work, if not better pay, than the faithful section foremen of perhaps twenty years' service. The old section foreman has a "savvy" of the railroad business, an intuitive knowledge of the requirements of train movement that it will take the fresh young maintainer years to acquire. Then we wonder why it is so difficult to secure loyal section foremen. Sometimes a belated effort has been made to let in the section foremen on the signal game. It is difficult, however, to get the signal people to take an appreciative and sympathetic interest in men who are not in "my department." Therefore, to prevent your track forces being thrown out of balance it will be better for a few years to keep the signal engineer on most railways as a staff officer without permitting him a line organization for operation and maintenance. Say to your roadmasters and section foremen that they will, at the company's expense, be given instruction in signals. When the signal engineer, the expert, pronounces them qualified by examination or otherwise, let them understand that there is a small automatic increase in pay. Transfer to branch lines the few who prove hopelessly deficient. The track laborer who can qualify to look after a particular signal is worth a few cents more a day to the company and should be so advised. If you start with the presumption that the man below is too dumb to learn you handicap him and probably doom him to failure. If you make him believe that he can learn what men of the same class around him are learning, that you, his elder brother, are in duty bound to help him, you will be astonished at the response of his latent intelligence. The great managers of the feudal period were forceful drivers. The great managers of to-day and to-morrow are great teachers, the greatest of all experts, because they show the man below how to do it. Lots of men know how. A good many know why. Comparatively few have that rare and valuable combination of knowing both how and why. It is not a happen so, but a response to the law of supply and demand, that men of the Woodrow Wilson type are coming to the front in our political life.

Getting back to signals. On a road of more than one or two tracks, it may be advisable to segregate your signals from your track. Here again the dividing line is volume of business rather than fancied importance of function. Signals are important, but so is the track. Each is an incidental component of railway operation, not the whole operation itself. On most railways the section foreman should be the responsible head of a complete sub-unit for everyday maintenance and inspection, including track, bridges, fences, poles, wires and signals. This may involve giving him more help or a shorter section.

One of the problems of line and staff is to determine what is intelligent rotation between the two. The line officer, dealing with men rather than ideas, may get into a rut of practice which prevents his seeing the beauty of the rainbow which the untrammeled staff officer may be tempted to chase too far. Some officers succeed brilliantly at originating or developing ideas in the staff and fail miserably at handling men in the line.

True individuality about which men prate the most is that which is understood the least. Our Army and Navy are insisting that before being staff officers, all officers, except surgeons and chaplains, must first learn to handle men by serving in the line; that crystallization in the staff must be prevented by periodic rotation to definite tours of duty in the line. The railway of the future will probably carry extra numbers of line officials in the various grades that some may be available for detail to the staff, that we may better co-ordinate our studying and our working activities.

People say that our good friend, Harrington Emerson, able and sincere, will unconsciously give the staff the best of it; while your old dad, on an even break, will be found on the side of the line. If they are correct, it leaves plenty of room for the other fellows in between. One of the delightful foibles that make human nature so interesting and so lovable is the inborn conviction of the average man that, "though H be a conservative and K a radical, I am always the happy medium."

Affectionately, your own,

D. A. D.

LETTER XI.

THE PROBLEM OF THE GET-RICH-QUICK CONDUCTOR.

Chicago, June 17, 1911.

My Dear Boy:—Not so very long ago the wife of a passenger conductor, running out of a large southern city, sought the assistance of her pastor, a noted divine. She was worried by the fact that her husband was stealing the company's money. With a good woman's intuition she knew that the wages of sin is death; that sooner or later her husband would lose his job and his family its legitimate income. To her good, old-fashioned, unspecialized conscience stealing is stealing, whether called "embezzlement," "holding out," or "trouble with the auditor." The fearless evangelist shortly afterward preached a powerful sermon against stealing, and included passenger conductors in his warnings. So incensed was the conductor in question that he announced his intention of disregarding the protection carried by the clerical cloth and of knocking the minister down. When the two met his bluff was called. The conductor, not the minister, came to his knees, not in fighting, but in prayer.

Here, my boy, is a canker sore that must be cured. Do not tell me that the Order of Railway Conductors is alone to blame. Do not tell me that in the lodge room the order side-tracks the eighth commandment for the working schedule. Do not tell me that the order will expel a member for any other offense rather than for stealing. Do not tell me that our problem is harder and our revenue less because Ed. Clark, the grand chief of an order thus lawless, was appointed by Teddy Roosevelt to sit in judgment on us from the high throne of the Interstate Commerce Commission. Tell me, rather, that we, the official class, are to blame; that we must cease to dodge responsibility. We, the educated and *entrepreneur* class; we, the elder brothers of society and industry, cannot shift the burden.

Please do not misunderstand me. There are many honest passenger conductors. I have known them on the road and in their homes. Some there are who deserve the more credit for withstanding temptation because of sickness or extravagance in the family. There are, however, too many dishonest passenger conductors. It is not enough for a man to be honest himself. The complexities of modern life make him more than ever his brother's keeper. He must not only stand for the right but condemn the wrong. The Order of Railway Conductors must make the American people believe that it is a great moral force for honesty in all things. We, the officials, must help the conductors to bring about this happy result.

The clerk for the corner grocer will not steal from his employer as quickly as he will from a large corporation. The existence of a personal employer brings home the moral turpitude by visualizing the individual wrong committed. Coupled with this higher moral incentive is the fear of detection through close personal supervision and interest. In a large corporation we have to approximate to this condition. The corporation, an impersonal creation, is vitalized by the men charged with responsibilities. The problem of organization is to give maximum effectiveness to this vitalization, to utilize to the fullest degree the personal equations of those entrusted with authority. Many railroads have lost control of their passenger conductors because of a fundamental misconception of the principles of true organization.

On the early railways the superintendent was the only officer the conductor officially knew. The superintendent, close to the president, was interested in the revenue as well as the disbursement side of the company's ledger. If the conductor stole, if the returns were short on a day of heavy travel, the superintendent was among the first to know it, and to preserve his own reputation, and thereby hold his own job, promptly discharged the conductor. By and by some conductors graduated into superintendents. This new condition brought a new temptation. The conductor, if allowed to keep on stealing, and if favored with a run where the stealing was especially good, could well afford to whack up secretly with the superintendent. A few, a very few, superintendents yielded to this temptation. Along came the auditor with his mistaken theory that human nature can be changed and men made more honest by being put in "my department." He said, in effect, "Take this away from the superintendent, who is dishonest and busy with other things; let this mysterious specialty of conductors' collections be handled by the only honest department." So the superintendent was relieved from responsibility for making his conductors render honest returns. He soon lost interest in that feature. The roads grew, and superimposed above the superintendent came first the general superintendent, and then the general manager, both also relieved from this responsibility to which the auditor clung with jealous tenacity. The conductor probably could not have told what principles of organization had been violated. He was the first to see the easier mark the company had become, the first to profit by the serious mistake that had been made. He found that his reports were checked by office clerks hundreds of miles away and entirely uninformed as to current conditions of local travel. The superintendent and the

other division officials who rode with him and knew conditions were powerless to check him promptly and effectively because his reports and returns were going to somebody else over the hills and far away. These officials, because somebody else was responsible, did not seem to care very much. So the conductor stole under their very eyes and got away with it. Anything like this which begets a wholesale contempt for duly constituted authority is demoralizing to general discipline. The labor unions are not alone to blame for the spread of insubordination.

All men are students of practical psychology, whether conscious of the fact or not. The conductor found that to hold his job he must do well those things for which the superintendent and the division officials were responsible. So the bigger thief the conductor became the more careful was he about other duties. He was a crank on train rules, perhaps, or made courtesy to the public his watchword. All of this stood him well in hand. Sooner or later the spotter caught him and the auditor requested the general manager to order his discharge. When this got down to the superintendent or the trainmaster the conductor was called in. Instead of being berated for a thief, if he acknowledged the corn, the conductor was discharged, half sympathetically, half apologetically. The division official would have resented the imputation of harboring or encouraging a thief. To him the conductor was an efficient, faithful employe, meeting all requirements of service. If the conductor failed to please somebody else it really must be the fault of that somebody or the system. This feeling was not unnatural, since the detection came through a discredited channel, the spotter. Rare are the circumstances where secret service should be necessary. There is something inherently wrong in any system which has to gain routine information by indirect methods. The detective should not be necessary for checking the good and the bad alike, but only for following up those who become manifestly bad or notoriously corrupt. The most efficient system is that where open checking and inspection are so thorough that temptation is diminished by the ever-present thought of prompt and sure detection. This desirable condition cannot obtain where the system makes such important officers as the superintendent and the trainmaster unconscious attorneys for the defense, sometimes openly advocating reinstatement of a thief. On the contrary, from its impersonal nature, a corporation must be so administered as to gain the moral effect of every available force for right, to secure the help, however small, of every person connected with the administration. Views of composite efficiency must converge at a point sufficiently near to be of practical value, not so remote as to be of only theoretical interest. No system is perfect. Under any conditions the very size of a railway necessitates a trifling allowance for peculation which creeps in. This can, however, be reduced to a negligible quantity.

So completely has the old system broken down on most railways—there are a few exceptions—that it has become a farce. It is a sad commentary on organization that many roads are giving the passenger conductor up as a bad job and putting on expensive train auditors who usually are really not auditors, but collectors. They are called auditors probably because they are under the auditor. It is a principle of organization that the staff as such should never command the line. The staff reviews, inspects, audits, studies, advises, suggests and, perhaps, promulgates, but should never execute, except as a representative of the line, the latter being responsible for the results of operation whatever the operation may happen to be. The accounting department is a staff department. When it was given charge of a line function, fare collection, a principle was violated. Ultimate failure of the system was therefore certain and inevitable. The train auditor proposition fails to recognize this underlying cause. It further violates principle, intensifies the evil and wastes more money by increasing the number of staff men doing line work. Its direct effects are vicious and its indirect effects are demoralizing to discipline. How can the young flagman have due respect for his superintendent or other official when he sees the train auditor come to the rear platform and demand to see the pass of the official? If he is an old flagman it is a little hard for him to see why he himself or his friend, the old station agent, might not have been given this new job with its fine pay. Like his superintendent the flagman may have been in the service twenty or thirty years. The train auditor, only last week a country hotel clerk, mayhap, flashes on them both as a would-be superior being from a better world. Neither of the two can become very enthusiastic in helping the train auditor to protect the company's revenue.

It is an awful reflection for the conductors to meet, that, although the railroads of this country are now spending hundred of thousands of dollars for train auditors, they are more than getting it back from increased collections turned in. Is not this more of a condemnation of the old system than a justification of the new? Whether or not the train auditor enters into collusion with the conductor, the former soon learns how easy it is to beat the system. When he does break loose he will be more reckless than the conductor. The latter probably had to work for years as a freight brakeman and a freight conductor to get where he is, and if he loses out may be too old to begin all over again. The train auditor gets his appointment too easily to value it very highly. Offsetting this is the fact that the train auditor is more amenable to some discipline because, as yet unorganized, he can not rely on the support of a labor union to secure his reinstatement. The auditor also has the advantage of examining character from a wider range of selection in choosing his train auditors. The train and engine services have been so badly over-specialized, as I shall show you some other time, that our choice is restricted to men whom the trainmaster happened to hire as extra brakeman years ago. These slight advantages in favor of the train auditor system have been given undue weight. We are all too much inclined to dodge responsibility, to take the course of least resistance and to pass it up to the other fellow. The

company pays the bill.

The railways of this country are wasting hundreds of thousands of dollars every year by failure to make the conductors do their honest duty. I would like to have you immortalize yourself by saving your company its pro-rata share of this economic waste. The American people at heart are honest, and barring a few dishonest traveling men who short-fare conductors and train auditors with cash, will in the mass support you and the Order of Railway Conductors in any intelligent movement for honesty. On the other hand, if the people at large get an idea that you are omitting to use all the moral forces at your command they will organize some more special commissions to handle another part of your business for you. Do not let the people get the idea that where passenger fare stealing flourishes, freight claims increase because some freight crews are robbing box cars, and expenses increase because some officials are grafting.

If I were your president I would ask authority of the board of directors, a staff body, to say, as a line officer, to you, also of the line, that as chief operating official you are the only passenger conductor with whom the executive and staff departments will normally deal; that your tenure of office depends quite as much upon your ability to prevent stealing as to prevent accidents. To the auditor I would say that he is responsible for certifying to the integrity of all components of your operations by proper examinations *after the fact*; that he has access to all your accounts and records; that he has no direct authority over any operating men; that all his instructions must be in general terms duly approved by the proper executive. Then he would be a real auditor instead of a chief accountant. We would not have to call in the public accountant to do our real auditing. You would be a real general manager.

Assuming that the proposition is up to you, then say to each division superintendent that he is the only conductor on the division in whom normally you will be personally interested; that the conductor will send either the original or a duplicate of every report made by him to the superintendent's office, addressing it impersonally, "Assistant Superintendent." Let the superintendent understand that he and his assistant superintendents when riding over the road on duty at the company's expense must openly check the train just as they check train orders. Pitch it on the high plane of self-evident routine duty for duty's sake, above any thought of underhanded spotting. Give the superintendent as many assistant superintendents and clerks as he may need. Do not let him employ specialists for this one simple component of operation. Have him bulletin train earnings by conductors that the dear women may help the cause by sewing society discussion. Let him have the community understand that some explanation is expected from a get-rich-quick conductor. By this time it will dawn on the superintendent and his assistants that their jobs depend upon the prevention of stealing. Their unconscious sympathy with the thief will vanish. Because they are close enough to the proposition to give practical attention they will prevent stealing.

I am aware that passenger conductors often run over more than one division. This presents no serious practical difficulty, although for many other good reasons also it is better, when practicable, for conductors not to run off the division. Pullman conductors run from their home district over the districts of several of their superintendents.

You and the auditor will have to work out the details as to the necessary bureau in your office, depositaries for money, interline relations and numerous other propositions which usually become self-suggesting when the broad working principles are established. You may, perhaps, need another assistant general manager for this work. You will not have the trouble a general manager in Mexico once did. His assistant general manager sold out, it is said, to the conductors. These conductors, mostly Americans, were an enterprising lot. They are also said to have bought the detective agency that was employed to check them up.

On some runs where the conductor is busy with numerous train orders you may find it better to make the head brakeman a collector, but never let him be a specialist independent of the conductor.

Affectionately, your own,

D. A. D.

LETTER XII.

THE LABOR NEMESIS AND THE MANAGER.

Omaha, Neb., June 24, 1911.

My Dear Boy:—You tell me that you are conducting labor negotiations these days. As I understand it, all the old grievances have been merged; after eliminating all demands introduced for trading purposes it is simply a question of more money. This simplifies the proposition. The union gets all that it can and the general manager gives up only what he must. Simple, but barbaric. Such innocent bystanders as the public and the stockholders may get hurt in the process, but that is part of the penalty for being innocent bystanders. We are in a transition period. All the hot air fests that you are now holding are probably necessary to blow the chaff away from the wheat. Sooner or later the irrevocable law of supply and demand must operate to place the whole matter of the compensation of labor upon a more scientific basis. At present it is rather the strength of the particular union than the relative justice of its demands.

Our predecessors of two generations ago did many fine things, but they overlooked some basic propositions. Suppose that fifty or sixty years ago when a brakeman expected to be promoted to a conductor they had said: "Fine, my boy. You have the ear-marks of a conductor. You understand, of course, that we have no conductors who cannot run an engine. We will arrange, without money loss to you, for you to fire two or three years. When you assure us of your ability to run an engine we will begin to commence to talk about making you a conductor." Later on a man with this splendid all-around training could have specialized along the line of his greatest aptitude. We would not see freight tied up in terminals waiting for firemen, with a board full of extra brakemen. There would be an elasticity of assignment that would work out for the good of all concerned. We would not have the fireman straining his back to shovel fifteen or twenty tons of coal while a different breed of cat, a brakeman, rides on the fireman's seat and forgets to ring the bell when the train starts.

We blame the unions for expensive lack of interchangeability of function. The fault lies at the door of the official class. The master mechanic said: "This is *my man*." The superintendent, and later the trainmaster, said: "This is *my man*." This pleasing tenacity for so-called individuality left the company out of the reckoning. The company got it where the chicken got the axe, sweet Marie. It did not take the men long to respect the plane of cleavage which the officials had projected. So we have a number of unions with conflicting demands rather than the more enlightened self-interest of a larger body. I know that it has been fashionable to play one union against another, but the day of this is nearly passed. Just how it will all work out I do not know; perhaps it is too late to expect amalgamation. Perhaps it will come of itself when the Firemen and Enginemen absorb or replace the Brotherhood of Locomotive Engineers, and when the Trainmen outlive the Order of Railway Conductors. Whatever the cause and whatever the existing conditions the result is plain. We have a number of forces operating to restrict the output of capable men. The economic machinery of society at large is therefore out of balance. You cannot blame the artisan, skilled or unskilled, for guarding the entrance to his craft. It is human nature, and it is right. The debatable ground, however, is as to where the entrance of the public at large should be to prevent the matter being over-done. No one labor organization can expect, in the long run, to be given preferred consideration over another; neither can the labor unions, comprising only a small percentage of the country's population, expect indefinitely to dominate society at large.

It is useless to expect to accomplish much in the way of increased elasticity of labor as long as railway officials, through so-called departments, insist upon narrowing and specialized rigidity. Such reforms to be effective must begin at the top. It will all come out in the wash, but in the meantime the laundry bills are disproportionate and may place cleanliness far beyond godliness.

General Sherman, one of the versatile geniuses developed by our great Civil War, once said that most men consider the immediate at the expense of the remote; that a few like himself were handicapped by considering the remote rather than the immediate; that really great men, like Grant, derived their title to greatness from an ability to balance the immediate and the remote. All men are more or less a product of conditions and environment. The railroad official of to-day lives from hand to mouth—the hand of expediency to the mouth of rapid-fire results. When more roads are like the Pennsylvania in having the stability which admits of intelligent, far-seeing, actual control by directors and executive officers, it will be easier. The banker, from his condition and environment, dreads a war or a strike more than the famine and the pestilence. The former two seem to him to be avoidable, while the latter may be visitations of Providence.

A strike, like a war, is a terrible thing to contemplate. A surrender to principle and violation of the broad laws of true altruism can be even more terrible. Last year when the Pennsylvania,

backed by its directors, called the bluff of the Trainmen, there was hope in many a breast that a lesson would be learned; that the rights of the community at large would be vindicated as against the unreasonable demands of the powerful few. How quickly did the Trainmen find an excuse to back down! Their friend and adviser, the late Edward A. Moseley, shrewd and scheming, once told them that their best weapon is a threat of a strike and not the strike itself. By and by the bankers will learn these lessons and bargaining will be scientific and altruistic as well as collective and coercive.

Perhaps you are thinking that, like the minister who lectures the members present for the non-churchgoing of the absentees, I am taking too much of this out of you. We all know, as do the labor leaders, that no general manager ever went through a long strike, successful or unsuccessful, without ultimately losing his job. The directors start out with the best intentions of supporting him. As the struggle grows fiercer, the temporarily reduced earnings have a refrigerating effect on their feet. This cold storage is reflected by a message to the brain that the poor Mr. General Manager is so unfortunate; that he lacks tact. "He is so rash. He jumps right in. We told him he might go out to swim and hang his clothes on a hickory limb. We cautioned him, as all prudent mothers should, not to go near the water." Everything in this world costs something, and nothing is more expensive than an unjust peace, a peace which leaves out of the reckoning the rights of the body politic.

One of the hopeful signs of the times is the opposition that the labor unions have offered to the exponents of so-called scientific management. Already our critics are giving indications of becoming our allies as against the hard-headed, selfish opposition of labor unions to progress. This will serve to help show the public our problems in their true light. All that we need ask is a fair hearing, and ultimately the calm judgment of the American people will decide aright.

I have no quarrel with the labor union, as such. Were I in the ranks I would belong to a union and give it my loyal support. Monopoly and combination of capital beget as a corollary a labor trust. You and I are powerless to eliminate the effect of such natural, economic forces. We can, however, help control the effect of these forces, preferably by reason. There are so many of the primal instincts and passions still extant in human nature that at times diplomacy exhausts itself and falls back upon the protection of forces offensive and defensive, active and passive.

You see that it is merely a phase of a general problem that a disproportionate amount of your time is taken up by affording an opportunity for delegates to make their lodges believe they are earning their per diem and expenses. What matters it to the locomotive engineers if their importunities cause scant attention to the unspoken rights of your clerks and trackmen? Why not figure out just what proportion of your time the different organizations are entitled to, shut off senatorial courtesy and limit debate accordingly?

Whatever you do, have your division superintendents present at your negotiations. Do not flatter yourself that your own wonderful ability will enable you to take a sound position on every question that may arise. Such deliberations are staff work and, unlike line administration, are not a one-man function. The final decision should rest with you, but in the meantime get all the light you can. Under the unit system the superintendent can be thus spared from his division to help save the company money because there is always a competent man to perform his duties, and a provision all along the line for automatic successions to meet just such incidents of service. It should be as easy for a chief assistant superintendent, familiar with the routine, to assume the superintendent's regular duties any day as for the second dispatcher to work the first trick. When your mechanical assistant conducts his shop negotiations, by all means insist that he direct the superintendent to send in each mechanical assistant superintendent to assist in the conferences.

One reason that the labor situation has gotten away from us is because the matter has been handled on too large a scale. The tendency has been to consider the abstract possibilities rather than the concrete effort. A superintendent of a 140-mile division once recommended approval of an application for increase in wages of his milk train crew, because the men on the next division were getting as much for running only 105 miles. Investigation showed that his men were on duty less than six hours, of which the total time consumed in handling milk cans was a trifle over an hour. Each general manager is inclined to believe that his men will get the worst of it as compared with other roads. He has been inclined to yield when he should have been firm. The further away from the concrete local conditions the negotiations can be conducted the more vulnerable are the officials. The labor leaders know this, and the more divisions or the more roads they can bunch in a single negotiation or arbitration the more unwieldy becomes the proposition and the greater the gain for labor. This condition of things was partly inevitable, is now partly avoidable. Uniformity may be deadly. Standardization can be run in the ground, as was shown when a West Virginia agent of the Chesapeake & Ohio painted his wooden-leg orange color with maroon trimmings.

Affectionately, your own,

D. A. D.

LETTER XIII.

A DEPARTMENT OF INSPECTION OR EFFICIENCY.

Chicago, July 1, 1911.

My Dear Boy:—One of the easiest things to measure, because definite in terms and limited in quantity, is money. The things which money may represent are hard to measure because often intangible and indefinite. The money account may or may not reflect efficiency in performance. Have we not been grasping at the shadow of money at the expense of the substance, effect? Consider, if you please, the working of a bank, perhaps the corporate institution in whose efficiency the public has the greatest confidence. In a small country bank one man does all the work. Later he requires a clerk or a bookkeeper. As the bank grows there are self-suggesting divisions of labor along such well defined positions as teller, paying or receiving, cashier, vice-president, president, etc. In the first place, the same man handles the money and its written representations, the accounts. When we reach the stage of having both a teller and a bookkeeper, the one is a check on the other, because of a difference in point of view. I do not understand that a bank considers its bookkeepers more honest than its tellers or vice versa. The bookkeeper came along to check the teller, not because of such marked variations in humanity, but because of the volume of business. There was more than one man could do.

The large corporations, including the railways, seem to have followed governments into a fundamental fallacy in the matter of money and accounting. Because, now and then, in spite of safeguards, a trust is violated and money embezzled, a remedy is sought by segregating in administration all activities having to do directly with fiscal affairs. The ultimate effect is dwarfing to administration and fatal to maximum composite efficiency. In a compact establishment like a department store or a large manufacturing plant, the closer contact of the departments concerned minimizes the evils of this segregation. The operations of a government or of a railway extend over so much territory that such close contact is impossible. The result is that our bookkeeper is too far away from the paying teller. The bookkeeper then arrogates to himself fancied qualities of a superior being blessed with a rectitude born of the guardianship of money. Yes, we must have the transactions of one man checked by another more or less disinterested. This is not alone a question of integrity, but concerns the failings of the human mind. The more conscientious and careful the engineer the more does he desire a check on his own calculations by competent persons. We accept the estimates of the engineer, swallow them whole sometimes. We tell him to go ahead and blow in the company's money or credit to accomplish a desired result. This is because we have confidence in his professional ability. When it comes to one of the components of his constructing work, the disbursement of real money, a lay function, we balk. We say to him, this is so different that your vouchers and checks are worthless until mulled over by a distant circumlocution office. This office, it is true, has no first hand, practical knowledge of what you are doing, but because this is money we feel safer by imposing such a check. When the bookkeeper sat in the same room, like a bank, and checked the engineer, this was a good working hypothesis. Did we not outgrow it long ago? We trust the engineer to hire a thousand men, to incur a legal obligation for us to pay them. Why send the pay-rolls several hundred miles to be checked by a lot of boys? Why not let the engineer disburse, subject to a real check, after the fact, by a competent disinterested inspection of his work?

The same general line of reasoning applies to all the activities of a railroad. We endeavor to insure integrity by disbursing only through the central offices of the auditor and the treasurer. By the same reasoning a large bank would keep its customers waiting at one window because only one teller would be allowed to pay out money. A bank can count its cash at the end of a day, but it can never tell exactly what remittances its correspondents have in the mail. A railway's money is even more in a state of unstable equilibrium. All night long some of its ticket offices and lunch counters are open. All night long cash fares are being collected on trains. The exact amount of money on hand at a given moment is only an approximation. This is natural from the characteristics of a railway. It would be a hard matter to stop every train and determine the exact location of every freight car, at home or earning per diem, at any particular moment of time. We can, however, approximate sufficiently closely to the conditions to serve all practical purposes.

Tremble not at my coming, Clarice; I would not push the auditor off the pier. Rather would I put him on the band wagon and let him blow a bigger horn. Is not accounting one of several components of operation of which collection and disbursement are yet others? Why not frankly admit that a railway is too unlike a department store to put all the cashiers and bookkeepers on a single floor? Why not interweave accounting with operation? Why not make such operating units self-contained, as experience may prove wise and practicable? Some of the best roads in the country now have division accounting bureaus in order that the superintendent may keep his operating expenses in hand. The next step must be a division disbursing officer. A pay-roll and

certain kinds of vouchers, including some for claims, must become cash without the worthless certification of the general office.

Returning once more to the bank for inspiration and for light, do the bookkeepers of a chain of associated banks report to a head bookkeeper in a central office in a distant city? No, each bank is a self-contained unit under the president or a manager. The policy is dictated, the methods are prescribed by a central authority. Efficiency, integrity, and uniformity are insured by inspections and audits by competent experts free from local affiliations.

What is going to become of the accounting department? Why, the accounting department is going to be absorbed by the operating department. From the ashes of the ruins there will arise a department of inspection or efficiency which will do the things that the so-called auditors are now helpless to accomplish. Some of the men in this new department will be recruited from the earnest officials and clerks of the accounting department of to-day. These men fail to attain the result they so loyally desire, not from their own limitations, but from the fallacy of the system under which they work. They deal with accounts—mere symbols; with money, a representative. Their work, to be effective, must deal with things, and above all with men. Audit is extremely important, but not all-important. Audit is a component part of a larger activity, inspection. The word inspection on railways is unfortunately and improperly associated with the thought of secret service and underhanded spotting. True inspection is as open as the day and as welcome as the evening. The earlier station agents resented the creation of the traveling auditor as a reflection upon their integrity. The station agent of to-day—and as a class what splendid, honest men they are!—welcomes the traveling auditor, because his visit means a clearance. The public accountant had a long fight for recognition of his legitimate function, first in England and later in this country. To-day he is established and is desired by the general accounting officers of railway corporations.

Following the public accountant comes the efficiency engineer. While one inspects conditions, the other audits accounts. By an easy process of evolution the two positions sooner or later merge into one. The volume of business may warrant segregation, however, into component activities. Sooner or later the final certificate must include inspection of men and things as well as audit of accounts.

We, the railways, are big enough to have our own efficiency engineers. This is a distinct function for the staff as contra-distinguished from the line. Efforts, more or less crude, to introduce special staff work have signally failed on a number of railways. The underlying cause has been a violation of the principle that the staff can never as such directly command the line. The temptation of the special staff men, call them inspectors or efficiency engineers, if you please, is to become meddlers. They are so enthusiastic for the cause that they desire to save the country and reform the road all on the same day. The men who succeed at special staff work are those who stick to the principle enunciated. An inspector, because he is a staff officer, should never give an order.

The coming new department of inspection or efficiency, like all innovations, will have its troubles. One of the temptations will be to build up an office full of clerks to check a lot of unnecessary reports. The head of the department, whether he be called general inspector or vice-president, will have to remember that untrained persons do not necessarily become endowed with superior intelligence and professional acumen by the privilege of personal contact with him and assignment to his department. To be successful his department will consist of a corps of highly trained inspectors of official rank and experience, capable of first hand dealing with things and men. The tendency of both inspection and audit is to become perfunctory. One remedy, found efficacious by the Army, is definite and periodic rotation from the line positions. The law of the survival of the fittest will bring out those all-around men who can succeed in both line and staff. The superintendent who has been detailed as an inspector for a year or two will return to a division with a broader view and will be a better superintendent. He will not resent the inspection of his division by the other department, because conscious of the fact that the inspectors are at least his equals, and perhaps his superiors, in experience and rank. These inspectors will certify not only that the money has been honestly and legally expended, but wisely and efficiently as well. While an absolute essential, honesty is not the only component requirement of good administration. The one road on which good intentions are standard ballast is not as yet telegraphing its accidents and its density of traffic to the Interstate Commerce Commission.

Affectionately, your own,

D. A. D.

LETTER XIV.

PRESERVING ORGANIZATION INTEGRITY.

Chicago, July 8, 1911.

My Dear Boy:—You write me that your work is heavy, that your territory is extensive, that you wish to divide it into two districts each under a general superintendent. If your president follows his usual practice and asks my advice it will be summed up in four letters, "d-o-n-'t." For years I have been seeking in vain for a general superintendent's district with an entirely satisfactory administration. I know many strong general superintendents. The trouble is not with them, but with the system. Organization is a series of units. These units get out of balance when they are defective or incomplete. There is usually withheld from the general superintendent some such vital process as car distribution, on the specious plea that such activity is so different it can be more cheaply handled by some higher office. If the organization unit is created it must have the same full chance for life and development as the rest of the offspring. A principle in organization cannot be violated with impunity any more than in other branches of science.

The average general superintendent's office is a great clearing house for correspondence. Few matters receive final action and many are passed along to the general manager's office. The resulting delay usually does more harm than good. On the other hand, since we all like to feel that we are highly useful, the general superintendent, or his chief clerk, is unconsciously dwarfing the initiative of superintendents by requiring references to him of matters that should receive final action at division headquarters. If you do not believe it, check up a few general superintendents' offices and study the processes. I am not referring to jurisdictions where a general superintendent is required by charter or other legal requirements. I have in mind districts which are arbitrarily created by ill-considered executive mandate.

The general superintendent starts out with a brave determination to get along with a small staff. Sooner, rather than later, human nature asserts itself; he feels that *my man* can be more useful if he is on *my staff*. He builds up a larger staff with an inevitable retarding bureau of correspondence. He perhaps has a $200 traveling engineer finding fault with the division performance of the $300 superintendent.

Sometimes a general superintendent is located at a large city under the theory that the importance of the metropolis demands an officer of higher rank. There are various ways to skin a cat, and the method we have seen is not necessarily the only solution. The Pennsylvania handles successfully large cities like Cincinnati, Cleveland and Chicago with a superintendent who has the authority of a general agent.

The unit system of organization, because based on sound fundamental principles, solves several vexatious problems. Among these is this matter of general superintendents' districts. Under the unit system every assistant should have his office of record in the same building with the head of the unit. For example, it is a violation of good organization to give a district passenger agent the title of assistant general passenger agent with an office of record at a city away from the general offices. If such outlying office of record is necessary, and it sometimes is, a complete unit should be segregated under a head with some such distinct title as district or division passenger agent. This does not, however, preclude having an assistant reside in the outlying city and maintain his office of record at the general office in the same file with the head of the unit.

If I were you I would appoint enough assistant general managers so that you can have one reside at each point where you have dreamed district headquarters are necessary. Give him a business car and a stenographer, but let him understand that his office file is a part of yours. Let him live on the road as a high class traveling inspector, superior in rank to the people he is inspecting. He is your staff officer with line authority available for action when in his judgment circumstances so require. He can obtain all necessary information from the files at division headquarters or by telegraphing your office. Your chief of staff, the senior assistant general manager, will promulgate instructions, while this traveling representative, like a trainmaster on a division, will see that they are carried out. When he finds it necessary to give instructions he should promptly notify your office, that the record may be completed and confusion avoided. He can do all this without becoming bureaucratic, without putting the company to the expense of a great circumlocution office maintained under the feudal notion of his royal importance. Railroad administration suffers from too many offices and instructions, not from too few. The best officials, and the best train dispatchers, give the fewest orders. It is a qualitative rather than a quantitative proposition.

The moral effect of the presence of an official cannot be discounted. We need more officials and fewer clerks. The railways are over-manned, because they are under-officered. The great mistake

of the past, due to crude conceptions of organization, has been in creating offices rather than officials.

The same line of reasoning applies to the handling of outlying terminals on a division away from a dispatcher's office. The old idea has been to locate a trainmaster with an office at such points. The moral effect of his presence is unquestionably good. The objection is that he must necessarily be on the road much of the time, and the train crews are handled by a clerk. Duplication results because most of the correspondence and records have to be referred to the superintendent's office. The Union Pacific has found it better under the unit system to have an assistant superintendent reside at such important terminals. His office, however, is located with the superintendent, which encourages travel back and forth, just what is desired, and discourages sitting in an office and carrying on correspondence which can better be looked after by the chief of staff in the superintendent's office. The train crews are under the immediate direction of the yardmaster when in the terminal, and of the train dispatcher when on the road.

The railroads of this country have suffered from rigidity in administration. The unit system permits an elasticity of assignment to take care of conditions as they come along. For example, your non-resident assistant general manager can, if desirable, chaperon three divisions when movement is heavy, and four or five, if you please, during the dull season. You can on short notice throw all assistants to the most exposed points. A non-resident assistant superintendent can likewise be sent to an exposed district. A permanently located trainmaster requires an official circular to have his jurisdiction extended, and if suddenly ordered away can leave only a clerk to represent the company. A railway has an ever-present firing line. The more mobile the official force the more promptly can weak portions be reinforced.

A striking violation of the unit principle in organization is to have the master mechanic report to the division superintendent in transportation matters and to the superintendent of motive power in technical matters. This is a half-way attempt at divisional organization which lacks the courage of conviction. Better have a straight departmental organization with its divided authority and expensive duplication than thus to straddle the question. If the division is to be a real unit, it must be complete and self-contained. The lack of balance in this attempt at divisional organization comes from the fact that units are mixed. The superintendent of motive power, a general officer with jurisdiction over the entire road, is a member of the general manager's staff. He has a rank and value superior to that of a divisional officer, the superintendent. The poor master mechanic is often puzzled which superior to please. His natural inclination will be toward the man higher up, the superintendent of motive power. Again, it is difficult for any three men to agree upon what are technical matters. The chief of staff method is not applicable to this phase of the problem, because units have been mixed. The master mechanic and the superintendent of motive power are not components of the same integral unit. The unit system of organization requires a superintendent of motive power to transact all business of record with the office of the superintendent of the division, a component unit of the general jurisdiction. The senior assistant general manager and the senior assistant superintendent, each, as a chief of staff for the head of his unit, decides promptly in the absence of the head of the unit, what matters are sufficiently technical to demand the attention of a particular official. Clear-cut, definite and prompt action is possible, with proper checks and balances, because units are not mixed. The governor can introduce a balance without throwing the administrative machine out of gear to avoid stripping its cogs. The splendid personal equation of railroad officials often serves to carry an illogical organization in spite of its fundamental defects. Similar violations of scientific principles in material things would cause bridges to collapse and locomotives to break down. The showing made by the railroads is a tribute to the administrative ability of their officials rather than to their knowledge of organization. The Pennsylvania a half century ago, and the Harriman Lines in more recent years, are said to be the only roads that have made comprehensive studies of the science of organization. Both of these great railways are prepared to stand the test of time. Both will grow stronger as the years roll by. So feudal is the conception of organization on most railways that the essential elements of self-perpetuation are sadly lacking. Fortunately their traffic strength is so great and our country develops so fast that errors due to preconceived misconceptions and personal caprice are covered up by increased earnings. One encouraging sign is that railway officials have ceased to be quite so cocksure of themselves and are seeking the underlying reason for the faith that is in them. True science ever finds its vindication in impartial inquiry and intelligent investigation. The world advances by definite steps rather than by leaps and bounds. Do not lament the fact that some roads are groping ahead only to occupy the abandoned organization camps of the Harriman Lines. Be thankful rather that they have moved forward at all, that though lacking in faith they are coming to a position admitting of enlarged perspective.

Affectionately, your own,

D. A. D.

LETTER XV.

THE SIZE OF AN OPERATING DIVISION.

Los Angeles, Cal., July 15, 1911.

My Dear Boy:—How many miles of road should one division superintendent handle? Like the old lady's recipe for pie crust, it all depends. Some superintendents in the east with two hundred miles handle as much business as do their western brothers with a thousand. As a matter of fact mileage has little to do with the question. On the ideal division the superintendent is in the middle with territory extending one freight district in each direction. If he happens to be at a hub he can comfortably handle several freight district spokes, which will increase his mileage accordingly. Under such a condition the advantages of a seemingly large mileage are numerous. The superintendent can run his power wherever most needed. He can hold back at the farther end of one district cars that he knows the connecting district cannot possibly load or unload for several days. He can preserve a balance which is impossible when jurisdictions divide at the hub. In the latter case each superintendent hurries freight to the end of the division to avoid a paper record showing delay on his territory. The result is that the next man has terminal indigestion because he has been fed too fast. Therefore, divisional jurisdiction should, when possible, change at an outlying district terminal away from a large city. This avoids the added complication due to industrial switching, suburban trains, restricted area, etc., etc. A congestion of cars is often caused by a congestion of jurisdictions. You may avoid the one by diffusing the other. Several roads in the country have saved heavy expenditures for larger terminal facilities by more scientific organizations.

The amount of mileage a superintendent can economically handle depends, then, for the most part upon the location of his headquarters. Such location in turn admits of no hard and fast rule. Cities and towns spring up and industries develop quite regardless of the limits of a hundred-mile freight district and a speed of ten miles per hour on the ruling grade. A railroad usually begins and ends at a large city which is either a seaport or a gateway. It is normally better to locate a division superintendent at such beginning and ending city. He can then handle its terminals and the one or more diverging freight districts. His division should include the terminal at the farther end of such districts, to afford him opportunity both to hold back stuff whose inopportune arrival might congest the more complicated terminals at headquarters and to relieve such terminals promptly by movement outward. In other words, owing to his important terminals this superintendent should have less mileage than his country brother who would be in the middle between the second and third districts.

Some roads try to solve the problem by giving the superintendent the first and second districts with headquarters in the middle. If in such case the general offices happen to be at the initial point they soon ignore the superintendent and do business direct with his terminal subordinates. When this condition becomes intolerable, one of two things usually happens. Perhaps the superintendent's office is moved to the first terminal where it really belongs. Thereupon he loses full touch with his freight crews on the second district, which is left out in the air. The other attempted remedy is to appoint a superintendent of terminals reporting direct to the general offices. The difference in viewpoint thus legalized may cost the stockholders much money. To the terminal superintendent the trains are always made up on time and the power and road crews are seldom ready. To the division superintendent the trains are seldom made up on time and the power and road crews are always ready. Much energy of both officials and their offices as well as that of the general superintendent and his office is then directed to holding useless post mortems and negotiating unnecessary treaties of peace. Remember, my boy, that typewriters exert no tractive power and explanations move no cars. Self-preservation is the first law of nature. We must so organize that this law will operate to keep the company into clear, not to put some other fellow in the hole. All of these questions are largely matters of opinion. After working with every kind of terminal organization all over the country, your old dad believes that the best is to have a division superintendent at the big terminal with an assistant superintendent in direct charge of and responsible for such terminal, the superintendent controlling every diverging freight district to include the next terminal.

It should always be remembered that a large terminal demands preferred consideration, because owing to restricted area its problems are intensive and expensive. A dispatcher has a hundred miles or more over which to keep his trains apart, while a yardmaster finds his engines bunched within a mile or two. Again, if the cost of terminal switching does occasionally happen to be reflected in a freight rate, the genial gentlemen of the traffic department are prone to recommend its absorption. I believe as a broad proposition that the management of railroads is more scientific than that of most modern industries. I would not like, however, to file much of their terminal operation as an exhibit. A majority of the switch engines in the United States have

one superfluous man in the crew. This is partly because so few operating officials have sufficient practical knowledge of switching to go out and intelligently handle a crew all day. If you don't believe this, make some time and motion studies of switching. Compare the relative performance of your yard conductors. The tasks of road conductors are relatively so well defined that comparison of individual performance is not so difficult. The intense conditions of a terminal complicate such differentiation as among yard conductors.

Another factor of prime importance in determining the size of an operating division is the location of train dispatchers. The dispatcher's table should always be considered an integral part of the superintendent's headquarters offices. The train sheet is perhaps the best record on a railroad. It is never fudged by being made up in advance. It is a history usually unimpeachable because it is so close to the actual transactions which it records. It deals with the essence of railway operation, train movement. Few are the important records on a railway that do not derive their primary data from the train sheet. The sheet may be graphic, like a daily time card chart, or may be cut up into card strips, as under the A B C system. In any form, it is a fundamental of operating history.

The number of dispatchers to which a division is limited is, like the number of miles, variable. With headquarters at the hub, one superintendent and one chief dispatcher may comfortably handle three or four sets of dispatchers. An outlying division with thin traffic may require only one set of dispatchers. When it becomes necessary to locate a set of dispatchers away from division headquarters, it is time to appoint another superintendent and create a new division, perhaps with only a light staff of all 'round officials. So important is the train sheet and so much of vital, human interest centers around a dispatcher's office, that the far away superintendent must refer much correspondence to this detached portion of his office. The result is expensive circumlocution and a lack of human touch. The superintendent has in effect become a general superintendent too far away from real things. A trainmaster or a chief dispatcher is really carrying the responsibility of a superintendent without the title and authority necessary for smooth administration. I know several railways that are fooling themselves into the belief that they are saving money by having one superintendent for two dispatching offices. One of them has five superintendents and ten dispatching offices, really ten divisions in fact, if not in name. By a logical arrangement of territory these ten dispatching offices could be consolidated into seven division headquarters and the road operated in seven divisions. In these days of overtime and complex working schedules, a timekeeper should check the time slips against the original train sheet, not against a copy, a transcript or an excerpt. A division accounting bureau handling all that it should handle has also much other use for the train sheet.

Second only in importance to the train sheet as a record, and with which it should be closely related, is the conductor's car and tonnage report; what the men call the wheel report. This important report made by a division man is sent to a remote general office in disregard of the responsible head of such division, the superintendent. The result is that a distant authority, the superintendent of transportation, is telling the superintendent that certain cars are being delayed on the latter's division. This profuse correspondence is often foolish, because meantime the cars have actually gone. Some roads now have a carbon copy of the wheel report made for the use of the accounting department. Why not send this carbon to division headquarters and let the division accounting bureau make up the ton miles and the car miles, subject to proper check after the fact? Why not have the office of the superintendent know so much about the cars on his division that he will tell the general offices that certain cars are being delayed on his division for lack of motive power, loading or disposition, conditions which, perhaps, the general office, with its larger view, can remedy? This would also permit, when desirable, the checking of the agents' car reports against the conductors' reports. The more closely to actual transactions we can do our checking the more intelligent should be the process and the smaller its volume.

I wish that you would come out here and see the Southern Pacific run its monthly supply, pay and inspection train. Before coming, re-read my letter to you on the subject some seven years ago. I know of no place where the idea has been better carried out. Ideas seldom originate with any one man. They seem rather to float around in the air. They are pulled down by those who happen to erect lightning rods or like Benjamin Franklin to fly kites. To vary the metaphor, do not laugh at people who ride hobbies. Sometimes they ride well enough and far enough to demonstrate that the hobby is a real horse. Then it is the turn of the horse to laugh.

Whenever I see an announcement that a division has adopted the telephone for train dispatching, I always feel that there should be an accompanying apology for being several years behind the times. For years progressive young railway men advocated the telephone only to be assured by old-time dispatcher officials of the unwisdom of such a course. Time and practical tests have shown that not only is the telephone practicable for dispatching, but it actually makes operation safer because of the increased human touch. Whenever and wherever we can replace a specialist with an all 'round man we are gaining.

The first train dispatching is said to have been done by Charles Minot when a superintendent on the Erie in the early fifties. So seriously was the matter taken that only the superintendent himself could issue a train order, even though this involved calling him out of bed. Hence the foolish feudal custom of signing the superintendent's initials to all train orders. It soon developed

that a regular dispatcher was necessary. Accordingly, a conductor, a man who knew how trains were practically handled, was taken off the road and brought to the superintendent's office to dispatch trains. Stop off at Port Jervis, N.Y., some time and in a local hotel see the portraits of some of these old Erie dispatcher-conductors, their dignity being protected by the tall beaver hats of the period. The dispatcher not being a telegrapher, he wrote out his orders and handed them to a young operator to send. This operator was a bright fellow, who, by and by, graduated into a dispatcher, able to send his own orders and often to do the work previously requiring both men. Too often it has happened that the experience of the new dispatcher, a telegrapher specialist, was limited to the office end, with no firsthand experience in train service. The telephone, fulfilling the immutable laws of evolution, will take us back to first principles. The dispatchers of the future will graduate from the train, engine and yard service, through the dispatcher's office to higher official positions. The man who gives the order will be a man who has once carried out such an order himself. The man below will obey the more cheerfully and the more intelligently because of increased confidence in the man above.

When the record is made up by the future historian, with that discriminating perspective which time alone can give, high will be the place accorded the railroad officials and employes of America. The military, the pioneers of civilization, the forerunners of stability, have their periods of enervating peace. Transportation, the first handmaiden of progress, is in active attendance every day of the year. Those who worship at her shrine and follow her teachings must lead the strenuous life and love the voice of duty. The splendid, virile performance of the past, handicapped often by crude facilities and forced expansion, must and will be eclipsed under the intense, trying conditions of the present and the future. In no profession more than in ours is there eternity of opportunity.

Affectionately, your own,

D. A. D.

LETTER XVI.

SUPPLIES AND PURCHASES.

Salt Lake City, Utah, July 22, 1911.

My Dear Boy:—Supplies and purchases are a feature of railroad operation illustrating the tendency to overcentralization through overspecialization. Please notice that I say supplies and purchases; not as some roads do, purchases and supplies. Is not "supply" the broader term, including "purchase" as a very important component? If we happen to make some of our supplies from our own scrap, a question of supply and accounts is involved, but not necessarily one of purchase. The volume of work involved in purchasing for a large railway may be so great as to warrant the segregation of the purchasing function.

Among the best purchasing bureaus in the United States are those of the Harriman Lines. As I understand it, their able director of purchases does not, as many people suppose, scrutinize all requisitions. Each of the eight vice-presidents and general managers has his own purchasing agent, who, under the broad policy of local autonomy, buys many articles as best he can. Those large items which experience proves can best be bought for all by the director of purchases, are so purchased under blanket contracts. For those items the local purchasing agent becomes an ordering agent. The point of it all is that no iron clad rule is laid down. Because some items can best be purchased in bulk, it does not follow that local administration should be hampered by requiring all items to be so procured. Instead of a narrow, rigid rule, there is a broad policy enunciated which permits the discriminating judgment of experience, to decide questions on their individual merits under the ever-changing conditions of service.

When railroads are older similar broad treatment will be accorded other features of operation as well as supplies and purchases. Broad policies and individual judgment will gradually supplant attempts to decide questions in advance in accordance with preconceived notions of probable conditions.

The evolution of the so-called store department on most railways has been a striking instance of one-sided development. A railway exists to manufacture and sell an intangible commodity, transportation, not necessarily to carry either a large or small stock of material and supplies. The purchasing agent tells us in good faith how much money he has saved the company by time spent in driving good bargains. He is not in a position to know how many men have been worked to poor advantage, or have been idle, while waiting for proper tools, materials and supplies. Such features of economic waste are not always the fault of the purchasing agent. The general storekeeper and the local storekeeper, ambitious for low stock records, may hold down their requisitions. It is so easy to say that a telegram will bring a cylinder head or other spare part to the desired point. If meantime a big locomotive has been out of commission in a distant roundhouse for two or three days and a light engine has been sent to protect the run, there is nothing in the store accounts to reflect this needless expense. The individual batting averages are high, but some way the team is not winning games.

One of the fallacies introduced by the store people is that the user of material cannot be trusted with its custody, because he will carry too much stock, due to an exaggerated view of future necessities. This mistaken theory is carried to the extent of denying to the division superintendent the custody of fifty shovels to be used by the emergency gang of fifty men which it is entirely within his province to order out to clear the road. The men he can command. The shovels, without which the men are useless, he must beseech from a storekeeper receiving, perhaps, one-third as much salary as himself. Of course, in an emergency, the superintendent takes the shovels, anyway. As I said before, it is a pretty poor system that breaks down in an emergency. The test of a system is an emergency. I confess my inability to see that being a user of material necessarily makes a man more indifferent to the company's interests. Perhaps it is the same habit of mind that causes me to deny greater rectitude to the man in the accounting department.

The user of material has undoubtedly been careless in many cases. Will he not become more careless if relieved of responsibility and informed that he cannot be trusted? When children err, the wise parent does not disown them. From his fund of riper experience, he helps them by impressive teaching to gain a proper viewpoint. Similarly, the general storekeeper should control the superintendent and teach the latter the most economical handling and use of material and supplies. Control is comparatively valueless without authority. This authority can be most effectively conveyed by rank. The general storekeeper should not be a keeper of a general store. He should be a general officer, under the general manager, superior in rank and pay to the division superintendent. Instead of the superintendent being relieved from responsibility, he should be held to a greater accountability. The reformed and reconstructed bandit often makes a

relentless police chief. The despised user of material under proper organization becomes the zealous conserver and protector.

The general storekeeper, like the chief mechanical officer, should be located in the same building with the general manager. There is no more reason for locating either one at a store or at a shop than there is for locating a general superintendent in a switch shanty near a yard. General officers must see the whole property and maintain a balance among its component units, which are normally operating divisions. If I were you, as between your purchasing agent and your general storekeeper, I would appoint the most experienced an assistant general manager, so that his office file can be logically and consistently consolidated with your own. The other of these two men I would make purchasing agent with a distinct title and a separate office file, because of his large volume of business with outside persons. Such assistant general manager would be in effect manager of supplies and purchases, the trained expert seeing the whole problem of operation and deciding normally what material and supplies the company needs. Under such assistant general manager, would be the purchasing agent, a staff officer, specializing on the technique and psychology of bargaining. Such assistant general manager, as a line officer, would be his own general storekeeper and would hold division superintendents responsible for the stores on their respective divisions. His work would be co-ordinated with that of the other assistant general managers by the chief of staff, the senior assistant general manager.

The organization thus outlined would preclude the necessity for the usual perfunctory approval of requisitions by the general manager. The assistant general manager for supplies would normally put the final approval on requisitions. Large or exceptional items the general manager would approve. When differences of opinion developed among the interested assistant general managers as to the relative ultimate economy of different mechanical or structural devices, the general manager would be invoked to give a decision that really would be worth something, because made after considering different viewpoints. Under the old order of things, the superintendent of motive power or the chief engineer is tempted to seek the ear of the general manager on the latter's best natured day to put over a requisition for some pet device. So sporadic is the comprehensive consideration of requisitions, so perfunctory is the usual approval, that the general manager frequently tells his purchasing agent not to take the former's approval too seriously, and to hold up approved requisitions about which the latter is doubtful. This is another species of unconscious administrative cowardice which attempts to put on the subordinate the burden of responsibility for a departure from the normal. True organization and administration demand normal procedure by subordinates. At normal speed, the administrative machine should run well balanced. When the speed becomes great enough, higher authority should be a governor brought into action more or less automatically. Telling a subordinate habitually to question the acts of his superior has the same cheapening effect as unchecked disregard of block signals. It puts higher authority in the undesirable attitude of exploiting a fad, or an over-worked system, rather than of demanding reasonable compliance with proper and logical requirements.

Have we not overdone the matter of low working stocks? Is it not more expensive for a railroad to carry too small a working stock of material and supplies than one too large? Is not the problem too extensive to warrant very rigid comparisons as between different roads? Like the average miles per car per day, does not the equation contain too many variables to admit of a very exact solution? Can we compare effectively the dissimilar conditions involved in climate, distances from producing and distributing centers, character of predominating traffic, etc.? Are not some records for seemingly low economical stocks based upon the fallacy that it costs the company nothing to ship and reship its own material? Where would these records land if company material carried a freight charge of, say, 5 mills per ton per mile? Is it not more economical to handle numerous items of supply in carload lots regardless of average monthly consumption? Have we given due weight to the concealed items of expense in arriving at conclusions as to the cost of handling company material and supplies?

Two of the best-managed roads in the country, the Pennsylvania and the Big Four, had no stores departments the last time I inquired. At the other extreme, we find the Santa Fe and the Lake Shore carrying their departmental system to their stores in an intensified form. In between—that happy medium which I mentioned to you—stand the Harriman Lines with division stores under the division superintendent, who in turn as to supply matters is under the general storekeeper or other chief supply official, the latter already having in some cases the title and status of an assistant general manager. The man in direct charge of the one general store which is allowed each general jurisdiction is called a storekeeper. The underlying conception is that railroad stores are maintained to help make the wheels go around, that all supply activities should be concentrated upon the most economical manufacture and sale of transportation.

This brings us to another phase of the problem. Frequently a railroad as a plant is adequate to manufacture more transportation than it can sell. The other fellow is getting too much of the competitive business. Investigation often shows that railroad solicitors can sell a shipper no freight or passenger transportation, because his salesman receives no orders from the railroad's purchasing agent. The industrial bureau of a traffic department works to create new business which is fostered by discriminating freight rates. Yes, I stand up and use the word "discriminating," because, when properly understood, it implies intelligence and science, and is

therefore one of the finest words in the language. This good work of the traffic department in creating wealth and developing industrial communities in territory local to a particular road may be largely lost to that road because its purchasing agent, consciously or unconsciously, fails to exercise proper and legitimate discrimination in the performance of his important function.

At first blush, in these days of doubting insinuation and hysterical aspersion, when a railway official is often denied the presumption of possessing common honesty, when the burden of proof is to show him as having average rectitude, such a statement may be construed by distorted minds as a plea for subtle forms of rebating. Tenuous as may seem the line here between right and wrong, it can in a given case be readily determined. Too often apparent complexities are only the result of an abstruse contemplation of abstract possibilities. Give honest, fearless, practical treatment to each concrete case as it arises, indulge more in inductive reasoning which predicates laws upon facts, not facts upon laws, and complexity gives way to common sense. Transportation is the most exacting, the most diversified, the most far-reaching of commercial and industrial activities. It follows then, under the law of the survival of the fittest, that those who can survive in the art and science of transportation must be the fittest of the fit. In their hands can safely be left the solution of these difficult problems.

After three years of satisfactory experience with division accounting bureaus, the Harriman Lines have extended such activities to include the division stores. This is done by moving the division storekeeper, his accounting and correspondence clerks, to the division superintendent's office in order that division records may be consolidated in one file and division accounts in one bureau. A division material-on-hand account is included. The necessary issue clerks, foremen, etc., are left at the storehouse, which is often a mile or two from the superintendent's office. Another avowed object is to get the division supply people closer to the train sheet, to give propinquity a chance to develop love, and to counteract that we-are-so-different feeling which comes on many railroads, not only in the spring, but under all signs of the zodiac. The logical development on divisions of considerable volume of supply business will be to make the division storekeeper an assistant superintendent. This method of store accounting is relatively closer to real transactions, especially where the division supply train is used, than might be supposed. On the Hill lines, the store accounting is done in the general auditor's office, perhaps one or two thousand miles from the store itself, a decidedly long range proposition. Which policy is better is of course a question of opinion. A man's views on organization and methods are largely a matter of temperament and association, just as his politics and religion depend usually upon heredity and environment.

Affectionately, your own,

D. A. D.

LETTER XVII.

CORRESPONDENCE AND EXPLANATIONS.

Portland, Ore., July 29, 1911.

My Dear Boy:—The man who is successful in the exercise of authority soon learns to be something of a buffer between his superiors and his subordinates. He learns to temper justice with mercy. In this little railroad game of ours there has often been an unconscious departure from this rule of conduct. The word "why" should ask for an increased overtime rate in its next working schedule. Somebody at the top is peeved because a train comes in late. He asks the next man below, "Why?" Down goes the inquiry through the baskets of offices whose files contain the desired information, because it is so much easier to write another man a letter than to dig up one of our own. The final inquiry is to a man who has already rendered one report or explanation. It would be a pretty poor sort of recording angel that would register against this underling the more or less justifiable profanity in which he then indulges.

Up in this part of the country, where they do some mighty good railroading, is a big hearted general officer, who once, during a blizzard, directed his superintendents to order train and engine crews to disregard block signals forced out of commission by the elements. A section foreman went out to change a rail with the traditional one man who could not flag both ways. So the section foreman, with the rail out, relied upon the [automatic] block signal for protection. Along came the train with orders to disregard the signal—and the engine landed in the ditch. There was some official talk of discharging the section foreman. The big general officer faced the music and said, in effect, that if any enforced vacancies were to occur he himself must be the man. "Furthermore," he added, "we have learned something; if we are ever again tempted to disregard block signals, we will first notify everybody on the railroad, including the section foremen." Such manliness is the rule rather than the exception among railroad officers. It is a practical kind of honesty which counts in the great art of handling men.

The lesson to be drawn is that we should all be just as honest and considerate for the man below in the conduct of our offices as in the face to face contact of outside activities. The first thought of an official and of his chief of staff should be to avoid humiliating a subordinate. A letter demanding an explanation accumulates much momentum of censure while traveling, perhaps from the general offices, through the channels to an agent, a yardmaster, a conductor, or a foreman. The tendency of each office is to unbottle a little more of a never-failing supply of suppressed indignation. By the time the return explanations and apologies have trekked back across the plains to the starting point, the whole incident is often as much ancient history as the days of '49.

Yes, we must have explanations for certain irregularities. The taste for such office pabulum is more or less cultivated. It is a kind of diet which demands vigilant restraint of appetite. It does not increase the self-respect of a faithful old employe to write a schoolboy explanation of something that looked badly on paper in a distant office. Actual experience has demonstrated that discipline can be maintained, efficiency increased, and loyalty engendered by greater politeness and consideration in official correspondence. Instead of the superintendent or trainmaster writing to a conductor, "Why did you delay No. 1 at Utopia when you pulled out a draw-bar on the main track on the 32nd?" why not say, "It is claimed that quicker work on your part would have avoided delay to No. 1 when your train pulled out a draw-bar, etc." This leaves it open to the man to explain or to let the matter go by default. The employe who lets too much go by default is soon well known to his officers and his cases will receive the special treatment they deserve. Some officials devote more time to the gnat-heel measure of explanations than to a broad analysis which will prevent future irregularities.

To some officials, papers on the desk are a nightmare. For the sake of a clean desk they will write unnecessary letters and pass the papers to the men below. The road will not go to pieces if many papers are held for a personal interview next trip. Because it is now and then desirable to force some old buck to go on record is no reason for not separating the sheep from the goats and avoiding the necessity for a record in a majority of cases. This is another instance where L.C.L. judgment is worth a whole trainload of rigid bumping posts.

Among the many advantages of the chief of staff should be his ability to prepare explanations for higher authority from routine reports at hand without making a special reference of papers to offices below.

Your old dad takes considerable pride in the fact that he never consciously wrote a sharp letter to a subordinate. Once, when a trainmaster, and sick in bed, he dictated in a letter to a conductor, "Hereafter, please take *sufficient* interest to see that switches are properly locked." The

stenographer improved the phraseology by writing, "Please take *special* interest, etc."—see the difference?—which happy circumstances caused the conductor to come to the sickroom and express his undying devotion to the cause of locked switches. A personal interview with a conductor, however, is worth a dozen letters by a trainmaster.

These same observations apply to the general manager as well as to the trainmaster. The higher one goes, the more consideration must he cultivate. If you have something disagreeable to get out of your system and the typewriter is your only recourse, take it out on your superiors rather than your subordinates. It is better for the company to have you fired for insubordination than for you to demoralize the service by rawhiding men below. You must carry out the policies and instructions of your superiors. The success of your administration will depend upon the manner in which you execute the wishes of your superiors and upon the methods you pursue, as much as upon the inherent merits of the policies themselves. Flattering yourself, as you probably do, at being the happiest of the happy in the medium line, see how safe a middle course you can steer. It will take another generation to eradicate feudalism in railroad administration. Those whom Fate, opportunity, or desire has landed in the railroad game must abide by the existing rules. If out of accord with the policies of those above, be a good sport and resign like a gentleman. Before doing so, however, be dead sure that you have not mistaken some trifling inconsistencies of methods for real incompatibility warranting voluntary separation.

A good friend and a good superintendent down south recently asked me to preach a little on the necessity for a more dignified tone in railway correspondence. He cited his correspondence with government offices as an example of dignified expression. Instead of saying, "Please advise me," or, "Kindly let me know," or "I wish to be informed," they use some such impersonal expression as, "Please advise this office," or "Kindly favor the department," or, "This bureau desires information concerning, etc." Some people say they like to have an official or an employe act as if he owned the property. I would not. A man will ride his own horse to death. When acting as trustee, guardian, or fiduciary, he will perhaps conserve the property entrusted to his charge more carefully than if it were his own. Is not a careful trustee better than a careless owner? Railway officials are trustees as well as hired hands. Through long traditions of service, the government officer, however hampered by certain limitations that are inherent in government administration, forms a habit of mind which prompts first attention to his employer rather than to himself. On railways we are equally loyal, but are cruder in our manifestations. We have the feudal conception of "*my* railroad" rather than that of "the railroad on which I have the honor to be employed."

Following the same reasoning, it is better for a man to sign, "John Doe, for and in the absence of the General Manager," than "Richard Roe, General Manager, per John Doe." When John Doe acts in the place of Richard Roe, the former has become the representative of the company, rather than a facsimile of Richard Roe. The act of John Doe binds the company, and the papers should show on whom personal administrative responsibility must be fixed. The phrase, "For and in the absence of," explains to the recipient the departure from normal procedure, and to the company's future reviewer is John Doe's explanation or apology for seeming usurpation of the functions of higher authority.

When you have signed a letter, no matter by whom suggested or prepared, it becomes your act for which you are responsible. Do not have its effect weakened by showing in the corner of the original the initials of the persons dictating and typewriting. Whether or not such initials shall be shown on your file carbon for the sake of future reference is a matter of taste. Such carbon copy record can be made either by a rubber stamp or by typewriter. With the latter method some stenographers prefer to slip in a piece of heavy paper to blank the original and to save the trouble of removing the outer sheet from the machine. The point is that, however desirable such information may be for your own office, it is no concern of the recipient of the letter. It is much more important that the carbon copy should show by rubber stamp or otherwise who actually signed the original and became responsible for that completed stage of the transaction.

The impersonal form of address used in government correspondence precludes the necessity for printing the names of officials on letter heads. Illegible signatures are a pretty poor excuse for attempting to issue an official directory in the form of a letter head. The working conception of the self-perpetuating corporation falls short if we must alter or reprint our stationery every time an official is changed.

We are wont to look upon government administration as typical of conservatism and circumlocution. Some things we do much better than the government. There are things the government does much better than we do. For example, an officer of the corps of engineers in the Army does his own disbursing. He controls all the component functions of his particular activity, including supply and purchase. He is checked up after the fact by an auditor in Washington. A railway cannot pay most of its bills until six or seven persons sign a voucher. Number seven signs perfunctorily because Number six did. Number six likewise is the cat that killed the rat that ate the malt that caused the voucher in the house that Jack built. It all comes down to some responsible man who handled the matter in the first place. Why not trust him, and perhaps one other, checking them both after the bill has been promptly paid? A bank check is validated by only one genuine, creditable indorsement. If drawn to bearer or to self, only one

signature is necessary. I am optimistic enough to believe that you will live long enough to see railways follow the example of the banks and the government and pay a legitimate bill with one, or at the most two signatures. When this is done, however, I trust that due notice will be given, so that the seismograph stations may have fair warning. If all the old time auditors turn over in their graves at the same time, the earth will tremble and the shock will be too great for delicate instruments.

Affectionately, your own,

D. A. D.

LETTER XVIII.

ORGANIZATION OF THE IDEAL RAILROAD.

Spokane, Wash., August 5, 1911.

My Dear Boy:—Someone has asked me how far up and how far down the principles of the unit system and the chief of staff idea can be applied. It is too bad the answer is so easy. Otherwise we might inaugurate a guessing contest and offer prizes. The unit system is applicable to every phase of modern organization. When its principles are better understood, you will see develop in the great financial centers some such important title as vice-chairman, in order that rank and authority may be conferred superior to that of the presidents of the constituent properties. Both the chairman and the president need a senior vice-chairman and a senior vice-president, respectively, to act as chief of staff. The New York Central once had a senior vice-president, W. C. Brown, and the St. Louis & San Francisco created the same position for Carl Gray. When these two able men became presidents, their former positions were discontinued. Puzzle: Find the reason. Answers to be sent to the Puzzle Editor, Louis D. Brandeis, Boston, Mass.

A prominent railway executive, who is also a distinguished bridge engineer, said to me, "You must be patient until railway people can measure this big idea in their own little half bushels. I did not see it clearly until I thought it through in terms with which I am familiar. I reverted to my graphic statics and measured organization as a bridge truss. This showed the chief clerk as a short ordinate between the longest, the head of the unit, and next longest, the official second in rank. We would never design a bridge that way, for the short ordinate in between would break under the strain. You interpose the chief of staff and diminish your strains logically to suit the decreased resisting power. Why don't you show the old telegraph men and the electric people the same idea in terms of things with which they are most familiar? They should see that you can not step down your potential through an undersized transformer."

Railroad administration is usually said to be divided into four real departments, namely: the executive, including legal and financial, the traffic, the operating, including maintenance and construction, and the accounting. Most railroads place each of these departments in charge of a vice-president. I think that this is usually a mistake. Experience has demonstrated the practicability of the same man being a division master mechanic, for example, and at the same time performing some of the broader duties of an assistant superintendent. Likewise an assistant general manager can act as the head of the mechanical bureau in the general office. When we reach so high as to go beyond the heads of real departments we find our old friend, volume of business, and his bastard brother, unbalanced administration, to demand more balance wheels. The unit has become of too large a size for a single governor. If you don't believe this, watch somebody try to transfer a bureau, freight claims, for example, from the department under one vice-president to that of another.

When I incorporate and organize that ideal railroad it will have a president, a senior vice-president and as many other vice-presidents as may be necessary. The vice-presidents will be real assistant presidents, not heads of departments. Each will be an expert graduated from some particular department. Such graduation will depend more upon the man being big enough for a vice-president and possible president than upon the department itself. Since volume of business warrants separation of the financial and the corporate from the legal, and of passenger from freight traffic, I shall have seven departments, under seven general officers, namely, the general inspector (who will also be the comptroller), the secretary, the general treasurer, the general manager, the freight traffic manager, the passenger traffic manager, and the general counsel. Each of the seven departments will have its own office file. All of the vice-presidents will have one consolidated office file in common with the president.

Trusting that these few lines will restrain you for a brief period, which is Boston & Albany for hold you for a while, let us consider the application of the unit system to a humbler sphere, that of roadmaster or track supervisor, who is the head of a highly important sub-unit of maintenance organization. The roadmaster's clerk is usually paid less than a section foreman. As a result such clerk is either a callow youth looking for speedy transfer or an old man married to the job. In the latter case, after one change in roadmasters the clerk probably dominates the office. He puts so much fear of paper work in the minds of the section foreman that few aspire to be roadmasters. Instead of a clerk, why not have an assistant roadmaster, a real understudy, promoted from section foreman at a slight increase in pay and allowances? Get the working atmosphere of the section into the roadmaster's office. Perhaps some of the section foremen are not relatively as stupid as certain superiors who take snap judgment on possible qualifications. Some people deny the necessity for a roadmaster's office. Is it not rather difficult to hold a man responsible without giving him access to first hand records of performance? An assistant superintendent or an

assistant general manager can and should come to his own headquarters where there are clerks to furnish him necessary information. A roadmaster away from division headquarters cannot gain such contact without deserting the subdivision for which he is responsible night and day. He cannot well take the section foreman from work to compile statistics.

When the word superintendent is eliminated from all higher titles so that it means the head, and a real head, of an operating division, there will be a bigger return for that item of operating expenses known as "superintendence." If the notion still lingers that operation is merely train movement, and that it is enough for a superintendent to be a high class chief dispatcher, the idea of real management can be driven in by calling the head of a division a "manager." In such case, the title general manager would have a logical meaning. The title district manager would fit the case where subdivision into such territorial units became unavoidable.

When the telegraph, the telephone, and the phonograph were invented the Greek language was consulted and new words were scientifically coined to express a new necessity of linguistic expression. The automobile and the aeroplane are founding whole families of new words. As society and industry become more highly organized it may be necessary to coin new words to convey the full idea of the rank and duties of the human elements in a large organization. Critics of the unit system deplore the uniformity of titles as tending to merge individual identity. This is not the fault of the system but of the poverty of the English language which lacks varying terminations of root words to express different shades of meaning. If necessary to meet this view helps can be sought from such highly inflected languages as Greek and Esperanto, and new words coined. Thus the same word with a slightly different ending would mean, "assistant superintendent in charge of maintenance of way and structures as classified by the Interstate Commerce Commission," or, "assistant superintendent in charge of maintenance of equipment, including an allowance for depreciation at the legal and constitutional ratio of sixteen to one, expiating the crime of 1873 and glorifying the Hepburn Act of 1906."

Many practical things in this world escape attention because they are so close as to be inside the focal distance. The persons most concerned are often too close to a proposition to observe what should be distinctly obvious. I uncover my headlight to the fellow down East who recently showed us all that green flags can be replaced by the night markers. For the over-specialization of perishable day indicators he substituted the all-round day and night marker. The supply people should not kick at the decreased demand for their product. They should be thankful, rather, that railroad officials did not wake up sooner to changed conditions. The new practice is worth the price of admission if it only serves to do away with the delay and inconvenience of loading and unloading the time-honored and cumbrous train box which still roams wild in some regions covered by the Spokane rate decision.

Among the other simplifications which time will bring is a logical method of designating extra trains. To-day we tell a man that an engine number means little, because the train indicator says that it is train so-and-so. The numbers on the engine and on the train indicator are different and have no relation. To-morrow the engine runs extra and the two numbers must be identical. When we adopt the train indicator, should we not banish numbers from the outside of our engines and tenders? Should not the number be inside the cab to be consulted for reports and statistics, including the train sheet? This would mean that extras would be numbered consecutively in a series higher than the numbers on the regular trains. Extras, like regular trains, would lose their running rights in twelve hours. In this connection, did you ever figure that, except possibly in the case of extras, the distinctions "A.M." and "P.M." are superfluous on train orders? Should P.M. come before the order is fulfilled, the A.M. train is dead.

The proposed change would force regular trains to be numbered in lower series, regardless of divisions and branch lines. This would make for safety. The more figures in a number, the greater the possibilities of error in reading a train order. A man is much more likely to confuse 2347 with 2345 than 47 with 45. If the motive power bureau must recognize the high numbered union for classification purposes, let us avoid having the blooming series federate with the train dispatcher's order book.

The magnificent distances of this western country are reflected in increased difficulties in railway operation. Perhaps no branch of the railway service is more affected thereby than the dining car service. American travelers, as the colored soldier said about the Cubans, are the "eatin'est lot of people." The long haul for cars and supplies renders supervision more difficult and deficits correspondingly greater. The dining car man on most, if not all, western roads is attached to a losing game. When poverty comes in at the door, love flies out at the window. The dining car superintendent is kept busy retaining the affections of the management in the face of red figures.

A dining car is about the most complex proposition in its operation that we have on the railroad. It will be the hardest to bring under the supervision of the division superintendent and his assistants. The difficulties of so doing are many, but are not insurmountable. The dining car, because it moves on wheels, is an incident to the manufacture and sale of transportation. It is not, as a few dining car people suppose, merely a traveling hotel to which the railway is an incident. Originally the dining cars were under the passenger traffic department. Later it was realized that they are logically a part of operation. So they have been placed under the general

manager and his subordinate, the superintendent of dining cars. We say nonchalantly that the superintendent and the train conductor can instruct the so-called conductor of the dining car. Let a passenger conductor report a dining car conductor. The former's superintendent will probably find himself helpless to defend his man against the momentum of a correspondence bureau located in the general offices. As a result, the superintendent and the passenger conductor soon lose interest. They are not looking for trouble and possible censure. The outcome is long-range supervision of a centralized activity. The man in charge of the dining car should be called steward, because he cannot conduct a car even to a side track. He should be under the control of the train conductor, whom the superintendent can hold responsible for the entire train performing proper public service. A good, honest passenger conductor can secure and retain more business for the company than two traveling passenger agents. The conductor cannot do this if the dining car man is unwilling to send promptly a pot of coffee to the shabby little sick woman in the chair car whose daughters are going to buy tourist tickets next year. In the days of simpler organization the good old passenger conductor would unload on the prairie a short-sighted sleeping car or dining car man and let the latter walk home. Because this cannot be done to-day is one of the reasons for the lack of initiative on the part of the train conductor. The lack of courtesy sometimes shown by employes is not infrequently the fault of heads of would-be departments whose tenacity for departmental lines leaves subordinates with an unbalanced notion of the necessity for real courtesy and consideration. Bowing and scraping do not alone constitute politeness.

One of the best dining car superintendents in the country is Tom Clifford of the Erie, a graduated division superintendent and passenger conductor. Because they are general officers, the dining car superintendents of the future should be assistant general managers, and should come up from the grade of division superintendent, in order to acquire a more comprehensive knowledge of operation. Just how to work out all the details is, I confess, perhaps the hardest operating problem that I have yet tackled. Pullman employes have a home terminal and a home district to whose superintendent certain reports are made and complaints referred. This works well, although Pullman cars may run over several of their superintendents' districts. The fact that dining cars run over more than one division is not of itself a sufficient reason for the employes being under the immediate direction of a general officer. Volume of business, density of traffic, shortness of runs, and other causes may warrant varying applications of the underlying principle. Above all, we should avoid those hard and fast rules which even the Medes and Persians never attempted to make applicable to dining cars.

Affectionately, your own,

D. A. D.

LETTER XIX.

THE ENGINEERING OF MEN.

Chicago, August 12, 1911.

My Dear Boy:—As the old order changeth, yielding place to new, the last of the feudal barons among the chief engineers are passing. Bold have been their conceptions, faithful their performances and great their achievements. Their work has developed those splendid types of manhood which are characteristic of the futile struggle of nature against art, of the wilderness against civilization.

Partly because of better intellectual training, partly because of the rush to complete additions and betterments and partly because of the inborn tendency of human nature to over-specialize, the construction men of most railways have frequently put it over on the so-called operating men. Peace hath her victories no less renowned than war. As civilization advances the struggles of a railroad are less against physical nature and more against sociological and political conditions. This advanced stage makes for altruism and comprehensive coöperation. The problem of the construction engineer becomes harder when his work is interwoven with the necessities of everyday operation. A manufacturing plant can sometimes shut down during a period of new construction. A railway, however, cannot store its product, transportation. Some car wheels must be moving all the time. It follows, then, that construction must yield to operation rather than operation to construction. Again, from the nature of a railway, construction is a component of operation, and the whole is greater than any of its parts.

During the period of rapid expansion the construction men were kept "on the front." Here is another bet that our predecessors overlooked. Instead of amalgamating construction with operation and developing a corps of all around men they sacrificed the future. The result is two sets of specialists lacking sympathy with each other's difficulties. The point of convergence is the company's treasury, which pays unnecessary bills. Sometimes these are in the form of a duplication of work train service; sometimes in idle equipment in which the construction bureau retains a proprietary interest on days of idleness. The construction people may be awaiting material or men. Meantime *my* work train cannot be used by the superintendent for maintenance purposes. The chief dispatcher has so little sympathy with new construction that the young assistant engineer dare not let go of *my* engine lest *au revoir* may mean good-by. Another delightful but expensive duplication occurs frequently in the matter of stores. Look around and see how many separate stores your construction bureau is maintaining, some of them within a stone's throw of a well stocked permanent store.

After defying a few times the official lightning our wise construction Ajax learns to make his estimates large. Having beaten his own figures he exclaims, "Behold how much money I have saved the company."

Comparisons of costs in construction work are much more difficult than in operation. This inability to control disbursement through the discipline of statistics should be met as far as possible by the most careful organization. Extravagance and waste in maintenance and operation are bad enough. In construction they are worse, because capitalized and bearing an interest burden for innumerable years to come.

All positions have their inherent temptations. The young engineer in charge of construction is tempted to nurse the job because when it is finished he may be laid off. Whether he yields or not, it is a poor kind of organization that places the temptation before him. Too frequently the construction engineer costs the company money because of his unfamiliarity with maintenance conditions. Experience in maintenance would help him in construction. Before being entrusted with authority an engineer should have experience in both maintenance and construction, regardless of the branch in which he may have happened to start. Check up your new branch lines and see how much money being charged to maintenance could have been saved if the construction people had better appreciated operating conditions. See how many side tracks and water tanks are on curves. Never investigate a collision without considering faulty construction and location as factors.

One of the easiest ways to save your company money will be to reorganize your construction activities. When you decide upon some new line, be it a branch, a second track, or an extension, call a cabinet meeting of all your assistants. Let the supply assistant of your grand opera troupe know at which stand you are to play. Call in the superintendent of the division concerned, with his maintenance assistant. Tell the superintendent that he will be responsible for the new work subject to the instructions of your construction assistant. Let it be understood that the work will be under the direct charge of his maintenance assistant, that the equipment will be looked after

by his mechanical assistant and the material and supplies furnished by his supply assistant. Throw the whole official momentum of the division on the side of the new work. Under the old order of things the division people do what they are told in helping out the construction, but no more. The proposed organization will beget that extra individual effort which is relatively as profitable as the farmer's extra bushel per acre. At this same cabinet meeting let your superintendent nominate a junior assistant to act as understudy for maintenance while his leading maintenance man is treading the construction boards. If, when the job is over, any scrimping has to take place it will not be the construction man who has to drop back. Two years hence the maintenance assistant will not give you the old song and dance about poor construction causing excessive maintenance, because he himself built the line. There is, of course, a danger that this maintenance assistant will be extravagant in construction for the sake of a future record in maintenance. You have two checks against this, one through the efficiency of your construction assistant and the other through the division accounting bureau, which should handle additions and betterments as separate accounts.

Once upon a time I ran across a contractor grading a new line. His organization, the most efficient that I ever happened to see in any line of activity, made that of the railway for which he was working look like thirty cents. He made the grading camp the unit. Each of his sixteen camps was in charge of a foreman who controlled his own commissary, his own timekeeper, his own blacksmith and his own animals and equipment. The first duty of the foreman was to supply his men with grub and his animals with feed. Normally this took two wagons. If he happened to be near the base of supplies he used only one team and put the other on a plow or a scraper. If he happened to be clear at the front he might have to borrow another wagon and use three teams for supply. The point is that he kept all of his teams working all of the time and never ran out of supplies. The railroad would organize a department of wagons, a department of plows and a department of scrapers, and the foreman who kicked the hardest would have the most grub, even though somebody else was short. These foremen were jacked up if they used poor judgment in accumulating supplies and had too much on hand when the next move came. No clerk at the base was allowed to cut the requisition of a foreman. The resident engineers of the railway in charge of the several staking and inspection parties could not procure railway commissary supplies without the O.K. of a clerk in the so-called boarding house department.

Another noteworthy feature was the constant presence of officials and sub-officials with authority to act for the contractor. A general foreman and two assistant general foremen were riding the line and giving instructions to meet changing conditions. For example, in the afternoon an assistant general foreman countermanded an order given by his general manager who had happened to be on the ground in the morning. When a resident engineer in charge of a party desired such authority he called up the tent of the division engineer and gained the desired information from the latter's chief clerk, who was receiving a smaller salary than the resident engineer. I spare your feelings a description of the complex methods imposed by the railway accounting department in marked contrast to the simple common sense practice of the contractor. How much stockholders are paying for maintaining the sacred system of railways I am unable to state. Many administrative crimes are committed in the name of organization.

One of the fallacies sometimes introduced by the accounting department in construction organization is to have all the timekeepers report to a chief timekeeper, regardless of the engineer or other chief of party. A bright young engineer once told me his troubles in this respect. He was astonished at the difference when he followed the advice to make each party a complete unit with its own timekeeper, the chief of the party being held responsible for proper time keeping as well as for all other duties. This efficient youngster deplored the fact that neither his engineering school nor his official superiors had ever deemed it necessary to give him lessons in the applied science of organization. Never forget, my boy, the immortal words attributed to George Stephenson that the greatest branch of engineering is the engineering of men.

Affectionately, your own,

D. A. D.

LETTER XX.

THE FALLACY OF THE TRAIN-MILE UNIT.

Tucson, Ariz., August 19, 1911.

My Dear Boy:—Do you think it logical and just to pay a train (including engine) crew the same wages for going over the freight district with a light caboose as with 50 or 75 cars? Be careful how you answer.

As I understand it, the train-mile was adopted as a unit of compensation for employes on the theory that piece work rewards the deserving and promotes efficiency. Whatever the merits or demerits of the piece work theory, I have never been able to reconcile its applicability to train service. A man operating a machine in a shop can stop or start his individual machine, can save steam power or electric current without seriously inconveniencing his fellow workers or the general operation of the plant. A railroad train cannot move regardless of all other trains on the road. Such independence of function will cause either a criminal collision or an expensive blockade. A train must, therefore, move according to a time-table and orders. The space occupied by a train, unlike a stationary machine, is so variable that time becomes the essence of the proposition. The train crew cannot be allowed that freedom of action which permits of piece work. Too many arbitrary conditions are necessarily imposed to warrant a very extended application of a practical bonus system. One delayed train will upset the whole day's combination. On the other hand, the task imposed upon a train crew is extremely definite and easy to measure, when the equation can be solved for all the variables.

So fallacious a unit of compensation as the train-mile breeds numerous illogical practices. We penalize ourselves every time we run a train without full tonnage. Conditions of traffic may demand quick movement regardless of tonnage. When business is heavy terminals are congested and empty equipment is scarce. We all know that the way to relieve congested terminals is to run light, fast trains. This serves a double purpose, relieving the terminals and increasing the earning power of the equipment. Unfortunately our fundamental conception is so distorted that we mulct ourselves in money by doing that which is an obvious necessity. Why not so arrange our methods that we can be rewarded for quick judgment and prompt action?

A shop workman sups, sleeps and breakfasts at his own home. A train crew must have increased expenses when away from the home terminal. A train crew would really be ahead of the game as far as expenses are concerned if a round trip could be made within the sixteen-hour limit and the away-from-home terminal expenses avoided. We say that demurrage is imposed primarily to hasten the release of equipment. We claim that normally we would rather have the cars than the dollars of demurrage. If cars are so valuable, how much should we charge ourselves for the hire of the fifty cars which are twelve or fifteen hours getting over the district?

We can work out by a mathematical formula the most economical scheme for fuel consumption and maximum tractive effort. It is more difficult to devise a formula to express the effect of drastic laws caused by poor service. Attempting to club converging live stock runs in big trains has caused, in some states, legislation covering the movement of stock. Perhaps this is offset by the claims save for missing the market with delayed stock. Is it not a sad commentary to think that legislation is necessary to make us do what is for our own best interests?

There can be no doubt that for a heavy and regular movement of low grade commodities on two or four track roads the big train is logical and economical. Most of the prairie roads are single track. Most of the distances between the prairie cities are relatively long. Stock, perishable freight and merchandise must have rapid movement. Is it wise under such a disparity of conditions to make the train-mile rigid and sacred? Why not pay men by the hour, with a monthly guarantee, and run trains sometimes light and sometimes heavy, sometimes fast and sometimes slow, to meet actual controlling conditions of traffic? When business happened to be light, equipment plentiful, and terminals open we would penalize ourselves in wages for slower movement, but would save in fuel, in engine house expense, etc. Just where the economical limit would be, just how it would all work out, I do not pretend to say. I do say, however, that the old methods can be improved when we start from proper basic conceptions. I do not believe that we yet understand the relation between increased cost of maintenance of equipment and decreased wages for train crews.

Perhaps because I had the honor of braking on a way freight I have never outgrown the idea of the practical trainman that a local freight is a traveling switch engine and a peddler of L.C.L. merchandise. Whatever may be the showing as to percentage of tractive power utilized I am unable to see the wisdom of a way freight dragging in and out of passing tracks all day with a lot of through cars. The claim is often made that a few big trains can be easily handled by the

dispatcher, because the number of meeting points is decreased. My own opinion is that this seeming advantage is often more than offset by the unwieldiness of the big train. Fear of censure for delaying some important train makes the conductor "leery" about starting and the dispatcher timid about directing a prompt movement. When we begin wrong, how not-to-do-it methods always follow. The chief dispatcher will let freight be delayed in a yard for a full train with power needed at the other end, if he can start a light caboose without its being included in the average train load showing. How much better, and how much easier, to run two fractional trains in the direction of unbalanced traffic than one light caboose and another dreary drag! The shipper, only a hard-headed business man, takes the same view. He becomes skeptical of all our statements, before commissions or elsewhere, because of our frequent seeming lack of judgment.

Let us not spend too much time in discussion as to theoretical possibilities. My assertions can be either proved or disproved by actual demonstration. In the next labor agreements you make include a stipulation for experiment on some division. My prediction is that if you can convince the labor leaders of your fairness they will give the scheme a trial for the sake of more possible time at home. With a full trial the results will speak for themselves. Success in such matters is made possible only by enlisting the most intelligent efforts of all concerned. Let your officials and employes understand that you do not claim to know it all, that you believe in their practical intelligence as well as in your own, that ideas are greater than men, and that right wrongs no man.

Railroads have grown so fast that our conceptions of working units have sometimes outstripped practical possibilities in performance. Too frequently we make the unit too large. There must be a practical limit beyond which the train becomes too long for an economical unit of movement. The fact that we should have elasticity rather than rigidity in the size of our economical train emphasizes the necessity for defining the elastic limit. Practical experience and sound judgment must aid in interpreting and applying not only the laws of matter and physical nature, but the laws of sociology and human nature as well. After the lading for the trip is discharged, the car cannot be sold or abandoned, as was the flat boat which Abraham Lincoln helped to float down the Mississippi river to New Orleans. Have you not seen cars pulled to pieces in big trains, have you not seen freight delayed in a manner to suggest to an innocent bystander that the road was perhaps running its last train and giving its cars their last load?

The inevitable tendency of the big train is to hold back and combine in large lots cars destined to the same point and to the same consignee. When a whole train can be unloaded at the ship's side at tidewater, or at a large consuming plant, the system is ideal. The trouble begins with the small consignee. Instead of giving him a regular, systematic delivery of the five or ten cars which he can unload each day, our tendency is to bring in twenty-five or fifty cars every five days or so, and then express our horrified astonishment at his failure to release promptly. No, we should not run special trains of five or ten cars for each consignee. What we should do is to watch the matter so carefully that we can feel certain we are considering all the factors of expense as well as that of seeming light tonnage. It may, under given conditions, be cheaper to run light trains than to put on expensive switch engines, to relieve unnecessary congestion in receiving terminals, than to increase overtime and demoralize the road by pulling out drawbars when sawing by at short passing tracks. Sometimes money can be saved by balancing motive power as between steep and level territory.

As a good soldier and a faithful hired hand you must build up for yourself and your superiors the best possible record for train load. Carry out the policy consistently and loyally. At the same time study the subject. Do not have to flag in, but be prepared to run as a section of a better unit of comparison when the train mile loses its first class running rights.

Speaking of running in sections, you have doubtless thought how inconsistent and almost criminally dangerous is the method of displaying signals. We drill our men to watch the rear of the train for the presence of something, the markers, a positive indication. When the markers are seen, the train is complete and the opposing train can proceed in safety. If the train happens to be complete without displaying markers, or the markers are overlooked, the opposing train declines to proceed. An avoidable delay occurs, but the error is on the side of safety and away from a collision. At the head end, however, we tell our men to watch for the absence of something, the classification signals, a negative condition. When classification signals are *not* seen the train schedule is complete and the opposing train proceeds in fancied safety. If the train happens to be *incomplete* without displaying signals or the signals are overlooked, the opposing train proceeds just the same. No delay occurs, but probably a collision, for the error is on the side of danger and toward a collision. The practice should be reversed. The last or only section should display classification signals. A positive indication should replace a negative. Can the train rules committee of the ladylike American Railway Association beat the Interstate Commerce Commission to this unprotected draw? Cases of such avoidable collisions can be cited, even though "we never had one on our road."

Some roads prefer special schedules and extra trains to movement in sections. On the good old Big Four we handled everything possible in sections. I think this latter method the better. Theoretically yardmen, section men, tower men and all others should be always prepared for extra trains. Practically, the more information that can be disseminated among intelligent men

the more effectively can they coöperate in preventing disaster or delay. There are fewer unlocked switches and fewer unspiked rails when information is not locked in the dispatcher's office and not spiked down by too many train orders.

Affectionately, your own,

D. A. D.

LETTER XXI.

THE MAN-DAY AS A UNIT.

Tucson, Ariz., August 26, 1911.

My Dear Boy:—If people's eyes were never too large for their stomachs there would be less overeating. If human concepts were never too vast for practical performance there would be fewer disappointments in administration. Because the railroads have grown so fast and have become so large, our imagination has sometimes run too far ahead of our judgment. This is a big world full of big things and big men. The biggest men are learning that big things can be handled and big men developed only by complete treatment of little things and of the so-called little men. This growing conviction is manifesting itself in various ways. Railways, thank God, are building more division shops and relatively fewer general shops. Division stores are becoming more and more complete. Division accounting is gaining ground and is paving the way for local disbursement.

The station agent, bless him, is being emancipated by the telephone from specialized selection, and is gradually being accorded that recognition which is his due as an all 'round man. In short, our big corporate units are growing in strength only as the smaller units become complete and self-contained. Official solicitude should be for ton-miles, as well as for train-miles, for car-loads as well as for train-loads. Take care of the mills and the millions will take care of themselves. Above all, study an often neglected unit, the man-day. How much work can each man reasonably be expected to perform in one day? How many days in each year can a man reasonably expect to be employed? Labor conditions on railways will never be satisfactory until employment can be reasonably constant and continuous. This is a difficult problem, but when enough big men give it attention it will be solved. It probably means more elasticity, more interchangeability between train service and the various kinds of maintenance, between the locomotive and the shop, between the railway and allied contiguous industries. The individual is the indivisible unit of society. We must build from him as a unit. Since he is of such infinite variety it follows that our sociological architecture must be varied accordingly. Design is staff work. Execution is line work. I do not doubt the ability of one man to direct the carrying out of a scheme practically designed. When one man tells me that unassisted he can furnish a design to meet all requirements I am from beyond Missouri and have to be shown several times.

I have been writing you all these things because of interest in you and pride in our profession. With four or five other professions and occupations at command, I stick to the railroad game because it is the greatest of ancient or modern times. If these letters, written hurriedly in the midst of a strenuous life, with little opportunity for revision and verification, have hurt anyone's feelings, I am sorry. Many things in this world are taken too personally and too seriously when intended as only Pickwickian.

If these letters have helped you or any friend of yours, by shattering any false idol or otherwise, they have more than fulfilled their purpose. Those to whom fortune has been kind in affording extended opportunities owe to society the duty of imparting their conclusions to their fellows. The recipients alone are qualified to judge as to how well such duty is performed and as to how far such conclusions are worth while. In this case the duty has been a pleasure as well.

To avoid the switch shanty garrulousness of an old brakeman I now give up this preferred run and turn in at the office my lantern and keys.

With a father's blessing,

Affectionately, your own,

D. A. D.

APPENDIX

THE UNIT SYSTEM OF ORGANIZATION.

This system of organization, sometimes called "the Hine system," is frequently mentioned in these "Letters." It was originated and installed by their writer while serving as organization expert for the Union Pacific System-Southern Pacific Company (Harriman Lines), 1908-1911, with the title of Special Representative on the staff of the Director of Maintenance and Operation, Mr. Julius Kruttschnitt.

An idea of the system can be obtained from the two following standard forms of official circulars for announcing its adoption:—

. . . . . RAIL . . . . . COMPANY.

OFFICE OF GENERAL MANAGER.

CIRCULAR NO. . . . .

. . . . . 191..

The following appointments of Assistant General Managers are announced, effective . . . . . 191. .

1. Mr.	2. Mr. . . . .
3. Mr.	4. Mr. . . . .
5. Mr.	6. Mr. . . . .
7. Mr.	8. Mr. . . . .

Each of the above named officials continues charged with the responsibilities heretofore devolving upon him and in addition assumes such other duties as may from time to time be assigned.

The titles, General Superintendent, Superintendent of Motive Power, Chief Engineer, Superintendent of Transportation, General Storekeeper, Superintendent of Telegraph, and Superintendent of Dining Cars, will be retained by the present holders or their successors to such extent only as may be necessary for a proper compliance with laws and existing contracts.

All persons under the jurisdiction of this office will address reports and communications, including replies, intended for the General Manager or for any Assistant General Manager, simply: "Assistant General Manager" (Company telegrams, "A.G.M."), no name being used in the address unless intended as personal or confidential or to reach an official away from his headquarters.

It is intended that an Assistant General Manager shall be in charge of this office during office hours. Each official transacts business in his own name and no person should sign the name or initials of another.

All persons outside the jurisdiction of this office are requested to address communications, including replies, intended for the General Manager or for any Assistant General Manager, simply: "General Manager . . . . . Co., ... Bldg. . . . . " no name being used in the address unless intended as personal or confidential or to reach an official away from his headquarters.

. . . . . .
General Manager.

Approved:

. . . . . .
Vice President.

. . . . . RAIL . . . . . COMPANY.

. . . . . DIVISION.

OFFICE OF SUPERINTENDENT.

CIRCULAR NO. . . . .

. . . . . 191..

Effective this date this Division discontinues among its officials the use of the titles Master Mechanic, Division Engineer, Trainmaster, Traveling Engineer, Chief Dispatcher, Division Storekeeper, and Division Agent.

The following named officials are designated:

1. Mr. . . . . , Assistant Superintendent.
2. Mr. . . . . , Assistant Superintendent.
3. Mr. . . . . , Assistant Superintendent.
4. Mr. . . . . , Assistant Superintendent.
5. Mr. . . . . , Assistant Superintendent.
6. Mr. . . . . , Assistant Superintendent.
7. Mr. . . . . , Assistant Superintendent.
8. Mr. . . . . , Assistant Superintendent.

They will be obeyed and respected accordingly.

Each of the above named officials continues charged with the responsibilities heretofore devolving upon him, and in addition assumes such other duties as may from time to time be assigned.

All of the above will be located in the same building with one consolidated office file in common with the Superintendent.

All reports and communications on the Company's business, including replies, originating on this division, intended for the Superintendent or for any Assistant Superintendent, will be addressed simply, "Assistant Superintendent" (telegrams, "A. S."), no name being used in the address unless intended to reach an official away from his headquarters, or to be personal rather than official, in which latter case it will be held unopened for the person addressed. It is intended that an Assistant Superintendent shall be on duty in charge of the division headquarters office during office hours. The designation of a particular Assistant Superintendent to handle specified classes of correspondence and telegrams is a matter concerning only this office. Each official transacts business in his own name, and no person should sign the name or initials of another. The principle to guide subordinate officials and employes is to be governed by the latest instructions issued and received.

Train orders will be given over the initials of the Train Dispatcher on duty, as will messages originated by him.

The modifications of pre-existing organization and methods herein ordered have been carefully worked out to expedite the Company's business by the reduction and simplification of correspondence and records. It is expected and believed that officials and employes will insure a successful outcome by lending their usual intelligent coöperation and hearty support.

Officials and other persons above and outside the jurisdiction of this division are requested to address official communications intended for the Superintendent or for any Assistant Superintendent, simply, "Superintendent, ... Division . . . . . ," (telegrams, "Supt."), no name being used in the address unless intended as personal or confidential or to reach an official away from his headquarters.

. . . . . .
Superintendent.

Approved:

. . . . . .
General Manager.

Transcriber's Note:

The word "To" was added to the title, in front of "His Son, a General Manager".

Minor typographical errors have been corrected without note.

Irregularities and inconsistencies in the text have been retained as printed.

*** END OF THE PROJECT GUTENBERG EBOOK LETTERS FROM AN OLD RAILWAY OFFICIAL. SECOND SERIES: [TO] HIS SON, A GENERAL MANAGER ***

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