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## STORAGE SYSTEMS IN RELATION TO DISTRIBUTION

28 February 1951

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COLONEL MATTHIAS: Gentlemen, in our short Distribution Course so far we have stuck pretty much to generalities. You will recall Captain Eccles talked generally of overseas systems; we had a seminar on the Navy system in the United States; we will have this afternoon one on the Army and Air Force in the United States; and we have had time to cover a few specific areas. One of these we covered Monday in our talk on cataloging and its influence on distribution. This morning we are going to hit another very important specific area, that of storage and the part that storage plays in the distribution system.

Having gotten this far in our planning, it was not hard for me to find a speaker to cover this area. I first met our speaker during the war. He gave me a lot of help; also a little trouble now and then. I was running the storage in the Office, Chief of Engineers and he was running it in the Army Service Forces. When I was in trouble it was my fault generally because he knew storage and I didn't. Since that time he has kept up with the storage problem through both his civilian activities—which you know from his biography—and also as a member of the Advisory Committee of the Munitions Board. Hence, I am sure he is more than qualified to discuss this very important subject with us. I take great pleasure in introducing to you Mr. Albert B. Drake, who will discuss storage and distribution.

MR. DRAKE: Gentlemen: I wish I could sit down and discuss this important subject of storage with you in groups of 8 or 10 so that we could get out all the points in which you are interested. But that is impossible. So I have done what I thought was the next best thing—I have prepared a paper in which I attempt to bring out one or two major points only. If the trend of this paper is not what you have anticipated and does not bring out the points that you wanted, I do hope that in the discussion period you will ask questions so all those points can be brought out.

The title of this discussion, "Storage Systems in Relation to Distribution," gives me a good deal of latitude; and your Commandant asked me to approach the subject from a broad point of view.

Most of the discussions of storage begin with fork trucks and pallets and end there. I am sure you gentlemen are concerned with something more fundamental than storage techniques. I'd like to try to get at the real meaning of storage and its implications for logistical support. I'd like to measure our present storage system against the standard that must be applied to everything in the military establishment—that is, "Will it help win a war?"

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I don't pretend to know all there is to know about storage. But my experience in civilian life, in the Army during World War II, and more recently as Chairman of the Industry Advisory Committee of the Munitions Board Storage and Handling Committee has put me in a position to form definite ideas about our present military storage system. In my opinion, it is not good enough for a major war. We have had great advances in weapons and tactics. But as it stands now, our storage system will not contribute as it should to the winning of the next war. I want to tell you why I think that is true and how we can improve the system.

Generally speaking, storage is a subject about which military personnel, from the high command to the rank and file, are not well informed. They have little appreciation of what it means; its importance has not been sold.

Perhaps that's because the term "storage" implies a static situation—supplies lying somewhere until they are needed. It doesn't intrigue you as terms like "guided missiles" or "atomic warfare" do.

But change "storage" to "warehousing" and you have a different picture. Warehousing includes materials handling; loading and unloading cars, trucks, and ships; and ground handling at an airhead. Now we're talking movement—movement from the great productive facilities of the United States to the rifle company and the artillery battery. Storage doesn't mean salting away supplies in some Gargantuan safety deposit box. Storage is flow.

And storage doesn't mean just ZI depots. Storage is overseas, too. The army dump is part of our storage system.

Think of the term "pipeline," which certainly gives a connotation of movement. Supplies in the pipeline are either on the rails, going forward, or in storage, which means they are waiting their turn to get on the rails or on ships.

When you talk about it in this way, storage becomes dynamic, affecting the very lives of our men. It takes its place as an essential element in the logistical chain, the lifeline of our troops.

Logistics encompasses certain major functions—research and development, procurement, production and delivery of supplies to the combat soldier. The technical services of the Army, bureaus of the Navy and commands of the Air Force have proven their ability to develop the finest weapons and materiel in the world. American industry has demonstrated that it can produce vaster quantities of these items than any other country. Nevertheless, delivery to the combat soldier is the sole justification of the entire logistical problem.

Let me cite a Buck Rogers' example to emphasize my point. If we could put right behind each division a manufacturing plant that could turn out every conceivable item at a moment's notice, we'd have no supply problem. But this is fantasy. What keeps our logisticians awake nights is that our factories are in Detroit and San Francisco, while our troops are fighting in Korea, thousands of rail- and ship-miles distant. There's a succession of depots, ports, railheads, and dumps in between. At each of them you move and handle and store supplies.

There's also the fact that our plants never produce at the same rate that troops need supplies. Nor can they produce without that headache of staff planners, "procurement lead time." And the further fact that it takes a train or ship a certain number of days to bring in needed supplies; therefore, you always have to anticipate requirements by setting aside stock at storage points.

All our military and industrial leaders at one time or another have said that this country and democracy are relatively safe as long as American production can keep far enough ahead of the enemy's. I would not for a moment discount the importance of production and I do not presume to dispute those statements. Yet they imply something that may not be so--that we can also swiftly move supplies to our troops and in such a way that they can be identified promptly and put to the use intended. I want to repeat that for emphasis. The materiel that will pour out of our factories is of no avail unless we can swiftly move it to troops and in such manner that we can identify it and use it for its intended purpose.

We had a great supply system during the past war. But it was great only because of the tremendous resources and productive capacity of our country. Sure, supplies moved, and in most cases moved on time to their proper destination--yet, at terrific, unnecessary expense, waste of supplies, and waste of manpower and effort. This was not because we were without good distribution, good transportation, or good storage--under the circumstances. This waste occurred because the weight of our logistical problems forced us to throw together quickly many different supply systems that had to be coordinated under emergency conditions.

The waste and loss of supplies at ports of embarkation and other transfer points overseas approached the dimensions of a scandal, and might have become a public one had there been more people in this country--and yes, in high positions in the Army also--who understood its significance. Most of it stemmed from lack of organization and training.

Our armed forces were not prepared then, and are not prepared now, with a physical distribution system that lends itself to the supply necessities of wartime. In both World Wars it was necessary to superimpose on the peacetime Army organization an "extra" supply agency,

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which took the form of the Army Service Forces in World War II. Since the war, military budgets would not allow the elaborate supply system required in wartime. But there is absolutely no reason why the peacetime supply pattern cannot be the same. Then it would not be necessary when war comes to create a new organization, with all the growing pains that it entails, but only to expand the existing one.

During World War II, great improvement was made in storage methods and practices, and millions of man-hours and square feet of warehouse space were saved. The methods of storage developed by the services then surpassed civilian practices and became a model for industry to emulate.

Nevertheless, millions of dollars worth of supplies, space, and manpower went to waste because the system was not standardized. The improvements were not applied across the board. I can cite many examples, as late in the war as 1945, of supplies lost through failure to observe the principles of good storage.

I know of an inventory called for on spare parts in the Pacific. The first reply read, "Approximately an acre of spare parts." The officers in charge of that depot did not know storage methods.

In the early days of AFWESPAC in the Philippines, I saw ships unload supplies by dropping sling and all into DUKW's. At the depot, a crane picked the sling out of the DUKW and dumped the supplies onto a huge pile--unstacked unsorted, and unissuable.

I saw supplies literally dumped in the streets of downtown Manila. They were handled that way so the ships could get faster turn-round. But you couldn't issue those items, because you couldn't identify them--or even find what you were looking for. Those mountains of materiel, costing untold sums for production and transportation, would better have been left in San Francisco. The mishandling of them in Manila caused shortages of supply in the theater and shortages of manpower at home.

What we must ask ourselves is "Why." Why did it happen? Will it happen again?

I have seen some of these abuses, to a lesser extent, in industry. The cause there, as in the armed forces, was that storage was not given the attention it deserves. That condition is being corrected in industry. It must also be corrected in our Department of Defense. Top management in civilian enterprises has come to realize that distribution--the storage, handling, and delivery of products--accounts for a large share of expense. So the function of distribution has been raised in the echelon of command to an importance approaching that of sales and production.

This has not been done in the Department of Defense. I realize the Department is new and working under difficulties. But I am afraid that even now some of those in the high councils do not recognize, as top management in industry formerly did not recognize, the importance of this function and the necessity for placing it high enough in the organizational structure.

The establishment of the Department of Defense gave us an instrument that can be used for standardizing our storage system throughout the military establishment, from point of production to point of use. I had the privilege of attending the late Secretary Forrestal's First Orientation Conference, where he and other department officials emphasized the intent to unify all common functions of the Army, the Navy, and the Air Force.

Storage is a common function. Men trained in sound storage practices can store any and all supplies regardless of the technical problems involved. If this is not 100 percent true, it is 99 percent true. Industry demonstrated that principle years ago. The public warehousing system of our country gives daily proof of it.

However, up to this time I know of no movement toward unifying the function of storage throughout the Department of Defense. The Air Force has its own depots, its own methods, its own paper work system; the bureaus of the Navy have theirs and the technical services of the Army have theirs. In all these, the techniques for stacking one box on another may be fairly uniform. With that exception, there is no unified movement of supplies in one standard system that allows for a fully mechanized handling which would save this country and the armed forces millions of dollars and thousands of men.

In fact, I believe the Army has retreated from the "unification" it achieved during the war. Each technical service is now practically autonomous in its storage operations. The general depot plan developed late in the war to unify and standardize depot operations has retrogressed, according to my information, rather than progressed.

By this time you may be asking, "Why should we have a standardized storage system?" Let me answer that by telling a story. One of our great soldiers, General Clarence Huebner, was a division commander at Omaha Beach on D-day of the Normandy invasion. He found there that he could never achieve his theoretical fire power because he never could bring into the line all the men normally expected to be there. For every man who was fighting, he had two men behind bringing up supplies.

General Huebner began to ask why supplies could not be handled by machines instead of by men. Why not strap supplies on pallets and let a fork truck or some other vehicle bring them over the beach and handle them in forward areas? For that matter, why not palletize at the factory and handle mechanically all the way up to the company or battery?

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Imagine, if you can, the savings in manpower and time that would be effected.

After the war, General Huebner put his ideas before General Leavey and General Heileman of the Transportation Corps.. The result was that a survey of the Army transportation system was made. The official title was "Initial Study of the Broad Field of Military Cargo Standardization." The project has always been known popularly as "Factory to Soldier," for one of the key questions was the feasibility of packaging supplies in machine-sized loads at the factory and delivering in those loads to front-line troops.

For all practical purposes, we have the technical know-how to begin right now moving unit or machine-sized loads from factory to soldier, handling them by powered materials handling equipment all the way. The Army had considerable experience with such shipments during the war. Unfortunately it has lost many of the skills developed for close-up supply of combat troops. Many of the lessons it learned have not been written down and may have to be relearned in the next war.

Nevertheless, technically, we can do this thing. We move trucks, jeeps, artillery, and heavy engineer equipment over all sorts of terrain, under all conditions, on wheels, to our combat troops. In other words, they move mechanically. There is no reason why supplies of all sorts cannot be moved by mechanized methods from production to fighting troops.

We can do it, except for one thing--organization. If we are to have a fully mechanized system of storage and handling from factory to soldier, we must have trained supervision, trained men, and the right equipment at every point along the supply chain. Everyone must abide by the same rules.

We must develop the best possible unit loads. We must adopt standard, efficient, mechanized methods. Finally, we must have training programs for supply troops as stringent as those given our combat troops--training under difficult terrain and weather conditions. During the war, there was a saying in the ZI, "on the beam or on the boat," meaning that those who were not efficient were shipped overseas. I saw the supply system in the United Kingdom. I saw it in Europe immediately after the landing and again after the Bulge. I saw it in the Philippines. I ran into a lot of men who were not on the beam and had been put on the boat. They hadn't been trained and the supply system overseas certainly showed it.

A mechanized supply system will never work without trained personnel. Supplies come from production and are delivered first to storage. It is there that they are first handled from transportation, from truck or railroad car into storage. It is at that point or even at the end of the production line that the supplies should be put into a unitized load and handled mechanically from that point on as far forward as it is physically

possible to handle that load mechanically. It is in the storage depot where supplies must first keep their identity. It is at the storage depot where chiefs of bureaus or command or technical services must get their inventory of supplies on hand, so that they know what and when to reorder. It is the storage depot that receives the order to ship either in the ZI or overseas. It is in the storage depot where men should be trained in the handling of supplies, in the proper method of storage, in location systems, in methods of shipping, in the handling of requisitions, in stockkeeping, and the many other functions that go along with the major functions of storage.

But before we can deal with techniques and training, we must attack the number one problem--organization.

In any supply system there is no item of greater importance than ammunition. You may run short of almost anything else, but short yourself on that and your troops face certain defeat. Mechanical handling of ammunition right up to the firing battery is one of the great prizes within our grasp.

Palletization of high caliber ammunition was a problem given to the Industry Advisory Committee of the Munitions Board Storage and Handling Committee. The Task Committee Chairman reported that it was difficult, if not impossible, to find out what the Army had already done on palletization of ammunition because there is no central point to coordinate the information, and further, that responsibilities for storage and handling of ammunition are so widespread and poorly coordinated that it is practically impossible to handle a load of palletized ammunition under the present system. He made the statement that the armed forces were full of men with plenty of ability and experience to work out palletized loads, but because of the way the handling of supply is now organized, there can be no assurance of a load being handled straight through the pipeline from production to the depots, to ports of embarkation, and on to ports of debarkation.

I have prepared an organization diagram portraying what I visualize the Department of Defense storage system looks like at the present time.

Chart 1, page 11.--At the top the first block shows the Department of Defense Plant; then a line comes down to the Navy Depots, Army, Air Force Depots, and the several depots of the technical services; then fans back to the ports of embarkation on down to the ports of debarkation; it then fans out again to the various depots and back again to the Army. I want to call your attention to a civilian plant producing goods and services for the Army. It then becomes a common function and it is turned over to a truck line or rail line which delivers it back to the services, to each individual service and then again transportation, the common function, picks it up and delivers it to the port of embarkation, port of debarkation, and fans out again.

In this sort of system, or, I should say, combination of systems, I think it is easy to visualize the excessive lead time required by Army commanders to allow for supplies coming from this country to overseas destination. I think it is easy to visualize the unnecessary confusion resulting at the points of embarkation when supplies are called forward through these many channels of supply for the orderly loading of ships.

In the instructions given me as to the scope of this talk, I was requested to suggest measures for obtaining the type of storage best suited to the military distribution system. I am sticking my neck out a good deal this morning and expect to get it partially chopped off when the questions come. There are many steps which probably must be taken to get the type of storage best suited to the military distribution system.

First, it must be realized that storage is a function common to the Army, Navy, Air Force, and their bureaus, commands, and the technical services. Then there must be vested in one of the Department of Defense staff agencies, probably either the Joint Chiefs of Staff or the Munitions Board, complete and undisputed authority to lay down rules and regulations by which the storage depots will be operated, and the handling systems that will be developed and utilized. When that is done, the staff agency so selected must make its plans with the best available staff and see that those plans are followed to the letter by the operating agencies. That method is probably the least disrupting and would cause the least confusion and the least resistance. But it is far from ideal and will not work as well as vesting the operating rights and authority for all storage depots, Army, Navy and Air Force, in one operating agency, which has complete authority to devise and operate storage and materials handling methods, including paper work and the training of personnel. This agency would then operate as a service organization, serving the Army, Navy, and Air Force. It would get the requirements for storage space, according to location from the various bureaus, commands, and technical services, and would be responsible for providing sufficient space and manpower adequately trained to handle the supplies when shipped from production. From that point forward, that agency would act as the custodian of the supplies and would be responsible to the chiefs of services as to inventory and condition and would ship on the chief of services orders when and where directed. The methods used in shipping, handling, and storage should be strictly the prerogative of the storage agency. When you picture this type of organization, the diagram of the storage system changes from this to the other picture.

Chart 2, page 12.—This chart shows the Department of Defense Plants; Ports of Embarkation; Ports of Debarkation; Department of Defense Depots; and the Army.

Now we have created a flow of supplies which allows for straight-line transportation, standard unitized load, standard methods of storage, standard mechanized methods of handling, standard paper work system, and

common language spoken at all levels. It fixes one responsibility for all these functions and the staff agency in the Department of Defense then becomes a staff agency and not a glorified ASF. It allows for the technical aspects of supply to be handled by technicians trained as specialists. Research and development men perform in their field; procurement in their field; production in their field; and storage in their field. The responsibility for the level of supply can remain as it is at the present time. The custodianship and the responsibility for movement is changed and standardized. This is my idea of the role of storage in distribution systems.

With this type of storage system, space is saved because space is consolidated. Men are saved particularly in the overhead jobs. There would be one overhead organization, rather than several as at present. Transportation would be saved because the use of the common storage system would allow consolidated shipping of LCL lots into carload shipments. Duplication of supplies would be cut down considerably. Items common to all services, such as cots, bedding, shovels, tools, and so forth, could be procured by one procurement agency and stored in a storage depot best suited as to location, from a production and delivery standpoint.

Economy is more important at the present time than ever before in our history. We have two enemies, communism and inflation. Inflation will wreck our economic system, and a poor economy breeds communism. I don't pretend to say that storage is a cure for communism or inflation, but I do believe a consolidated storage system will make possible many worth-while economies in our present supply system. And supplies saved are just as good as increased production.

I fully realize that I have presented my talk and drawn conclusions that are highly controversial. Nothing new or drastic has ever been presented that is not controversial. Any remarks in my talk which appear to be criticism are made solely with honesty of purpose and with the idea of being constructive.

Thank you.

(3 May 1951--350)S.

CHART 1

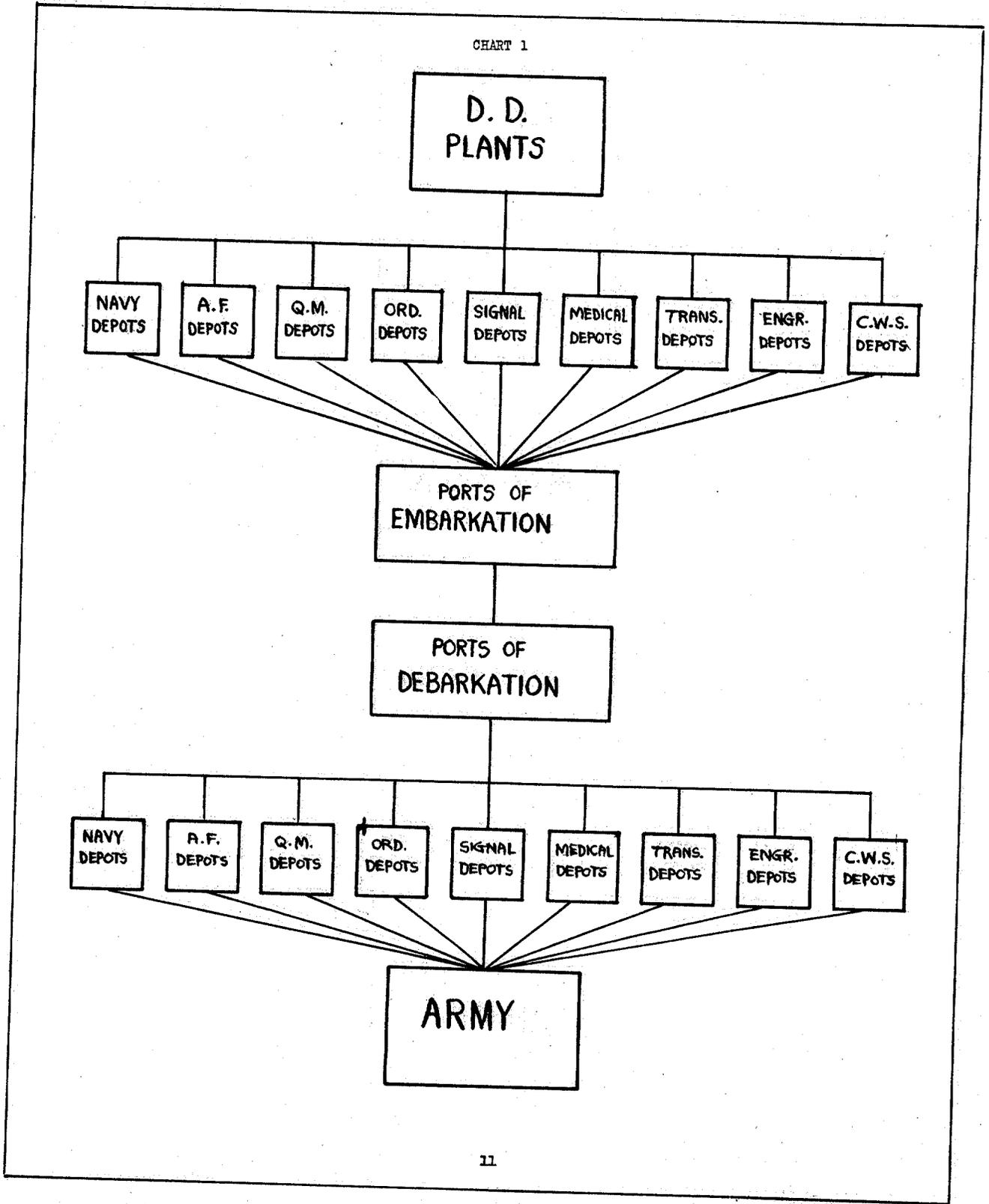


CHART 2

