WORK OF THE STATISTICS BRANCH, UNITED STATES ARMY.

BY

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The statistical problems of the United States Army during the present and passing war emergency have been characteristic of the organization and nature of war activities. The unprecedented extent, urgency and multiplicity of demands upon the military forces called for the development of a system of centralized and epitomized information for the chief executives of the Army with the least possible delay. The lack of such a system would have meant a disastrous failure of coördination of our activities among themselves and with the efforts of the Allies.

There was no ground work on which to build. The peace time army had been small and relatively inactive and the need of a modern statistical service had not made itself felt. Nor were there many sources of instructive figures in the past records of the army. Its work had not been such as to furnish a suitable basis for predicting the future. The immediately effective use of probabilities was largely precluded because of this lack of a basis in past experience.

It was seen that, in order to attain the greatest measure of usefulness, there should be organized a system of current information which would present a complete, vivid and compact picture of the progress and status of army activities. On the basis of such information pressure could be applied to accelerate lagging or urgently needed work and, as information accumulated sufficiently to indicate trends and relationships, increasingly adequate prophecies of accomplishment could be made. These prophecies could be used as a basis for promises and for future plans, while the current operating indices would furnish a check on fulfillment of promises and plans.

The War Department had no agency for such work at the time of our entrance into the war. But there was organized in the first

month of our participation, in the Council of National Defense, a division of statistics which established relations with the various bureaus of the War Department, securing from them regular reports on the progress of their work. Information obtained in this way was brought together in a weekly statistical report for the Secretary of War and, in addition, special studies were made from time to time on shipping, ordnance and aircraft.

In order that the War Department might have a central statistical bureau in its own organization it was decided to establish the Statistics Branch in the office of the Chief of Staff, this branch to have charge of the collection and presentation of all statistics of army work for the guidance of the Secretary of War, the Chief of Staff, and their associates.

Accordingly, those of the personnel of the statistics division of the Council of National Defense who had been immediately concerned with army statistics were transferred to the War Department. Several were given commissions, others continuing in a civilian capacity. The chief of the division was made Chief Statistical Officer of the newly created branch.

The weekly summary report on War Department activities was continued. Specialized sections of the branch were established to deal with important phases of the war program. Specialized reports were issued from time to time on personnel of the army; shipping; ordnance and chemical warfare; quartermaster and motor transport; signal, medical, engineers and construction; and the air service. There was also instituted a weekly statement of progress for the personal information of the President. Thus there was developed gradually a system of control statistics which enabled the executives responsible for the conduct of the war to learn with the least possible expenditure of time the absolute and comparative accomplishments of their bureaus.

The lecture service of the statistics branch was another significant contribution. Regular conferences were held by War Department executives, by officials of the War Department and associated officials from other departments, and by congressional committees at which lectures were given by representatives of the branch. Figures and diagrams covering the work of each conference were presented on large wall charts, and their significance explained. These lectures assisted in furnishing a sound basis for discussion and in concentrating discussion on pertinent points.

The work of the branch can best be described by presenting some of the diagrams which were actually used in its reports and which served as a guide for the operation of the military organization. Those presented are but a small proportion of the whole number.

Strength of Divisions.

TABLE 7.

Strength of 15 Divisions Reporting from Camps in the United States November 1, 1918.

Division.	Location of Headquarters.	Officers.	Men.	Total.	Percentage of 28,164.
9	Sheridan	1,013	22,913	23,926	85
10	Funston	924	26,729	27,653	97
11	Meade	954	23,041	23,995	85
12	Devens	1,027	25,895	26,922	96
13	Lewis*	1,039	20,680	21,719	77
14	Custer	1,059	20,755	21,814	77
15	Logan	710	11,526	12,236	43
16	Kearny*	762	11,196	11,958	42
17	Beauregard	469	5,520	5,989	21
18	Travis	788	11,989	12,777	45
19	Dodge	888	11,940	12,828	45
20	Sevier*	506	8,769	9,275	33
95	Sherman	564	6,816	7,380	26
96	Wadsworth	245	1,051	1,296	5
97	Cody	368	3,064	3,432	12
Total		11,316	211,884	223,200	53

* No written report, telegraphic figures used.

Percentage of Authorized Strength.

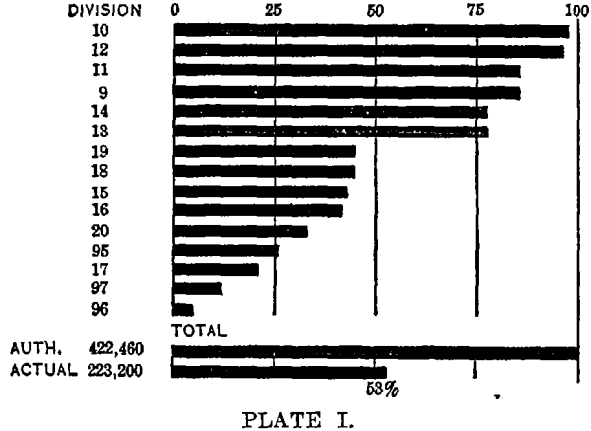


PLATE I.

LENGTH OF SERVICE IN DIVISIONS.

TABLE 24.

LENGTH OF SERVICE OF ENLISTED MEN IN DIVISIONS IN UNITED STATES NOVEMBER 1, 1918.

(From telegraphic reports.)

Div.	Location.	Total Men Reported.	Length of Service.						Total Officers Reported.
			Over Three Months.		One to Three Months.		Less Than One Month.		
			Number.	Per Cent.	Number.	Per Cent.	Number.	Per Cent.	
9	Sheridan*.	22,997	16,653	72	6,311	28	33	0	1,014
10	Funston...	26,833	23,528	88	3,299	12	6	0	937
11	Meade	18,979	14,118	74	4,773	25	88	1	739
12	Devens....	20,290	17,315	85	2,974	15	1	0	717
13	Lewis.....	20,680	13,308	64	7,362	36	10	0	1,039
14	Custer	20,127	15,159	75	4,945	25	23	0	1,051
15	Logan†...	11,526	8,439	73	3,086	27	1	0	710
16	Kearny ...	11,196	7,654	68	3,451	31	91	1	762
17	Beauregard	5,520	3,234	59	2,282	41	4	0	477
18	Travis	11,462	9,912	86	1,550	14	—	0	751
19	Dodge	9,265	5,211	56	3,967	43	87	1	588
20	Sevier	8,769	8,379	96	383	4	7	0	506
95	Sherman ..	6,817	3,318	49	3,492	51	7	0	564
96	Wadsworth	1,061	991	93	70	7	—	0	245
97	Cody‡....	1,190	907	76	283	24	—	0	222
Total		196,712	148,126	75	48,228	25	358	0	10,322

* Includes 9th Field Artillery Brigade and Ammunition Train at McClellan.

† Includes 15th Field Artillery Brigade at Stanley and 215th Engineers at Humphreys.

‡ Does not include 172nd Field Artillery Brigade and 322nd Ammunition Train at Jackson and en route.

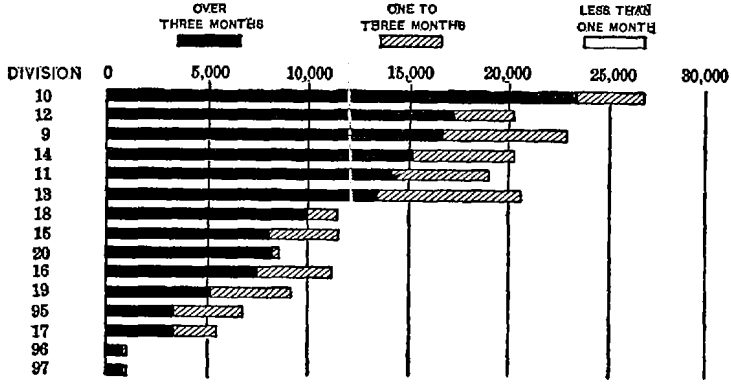


PLATE II.

They have been selected as a representative collection, covering a wide range of subject matter and of methods of presentation.*

Of first importance to the Army was the question of personnel. Several pages of the weekly report and an extensive semi-monthly report were devoted to this subject. Plates I and II show the status

DISCHARGES *vs.* ARRIVALS FROM OVERSEAS.

A comparison of discharges and arrivals by weeks indicates that by late in February the bulk of home units had been demobilized and that since then discharges have been largely among troops returned from the A.E.F.

Source of information: Miscellaneous Division, Adjutant General's Office; Transportation Service, Purchase, Storage and Traffic Division, General Staff.

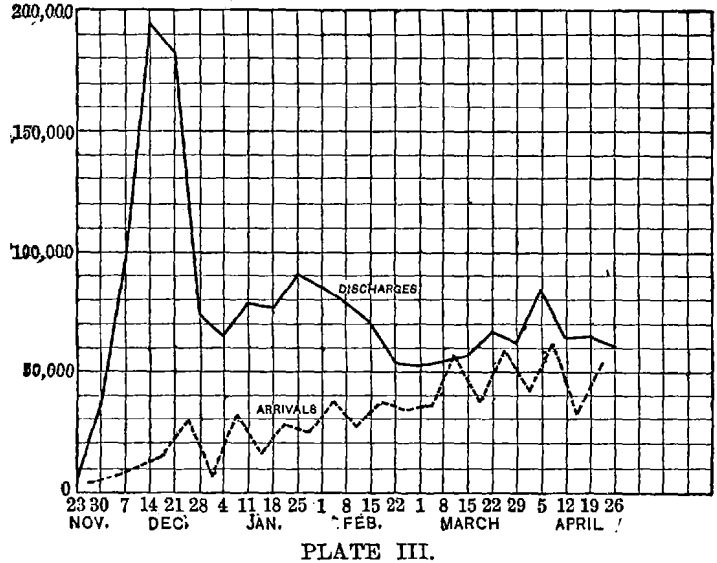


PLATE III.

of divisional organizations in the United States on November 1, 1918, Plate I indicating their development in terms of strength and Plate II in terms of experience. Diagrams of this sort served as a basis for planning the movements of men overseas and the drafting of new men into the army.

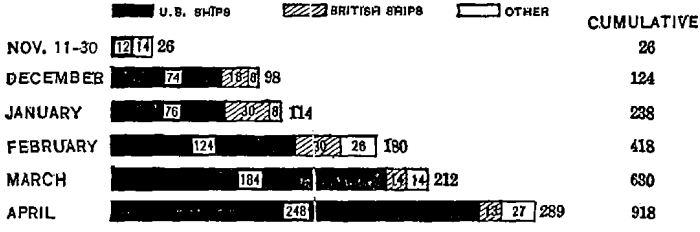
* For presentation to the army executives each of the diagrams used in this paper was combined with typewritten text and/or tables, photostated and the photostatic sheets bound together to make a complete report. Each "Plate" represents one page of the report and differs somewhat from the original as text and tables are set in type, a positive rather than negative method of reproduction is used, and the size is reduced.

When the Armistice had been signed and problems of demobilization were uppermost, diagrams were regularly presented to show progress in this work. Plate III indicates the progress of demobilization and the source of discharges.

Plate IV reproduces the diagram and table used to summarize the movement of troops homeward, showing the rapid acceleration of the movement and the increasing importance in its accomplishment of ships flying the United States flag.

TROOPS EMBARKED FROM A.E.F.—BY MONTH, PERIOD, AND FLAG OF TONNAGE.

Thousands of troops embarked since November 11, 1918, including officers, enlisted men, nurses and civilians.



TROOPS EMBARKED FROM A.E.F. BY PERIOD AND FLAG.

	U. S.	British.	French.	Italian.	Other.	Total.
Nov. 11–20	5,377	8	—	—	—	5,385
" 21–30	6,813	13,992	—	—	—	20,805
Dec. 1–10	18,080	7,014	—	—	—	25,094
" 11–20	18,226	5,693	3,721	—	—	27,640
" 21–31	37,078	5,677	11	—	2,130	44,896
Jan. 1–10	26,999	9,887	883	—	—	37,769
" 11–20	26,237	6,671	1,164	1,776	—	35,848
" 21–31	23,070	13,349	422	3,226	—	40,067
Feb. 1–10	48,336	6,228	5,342	3,777	4,805	68,488
" 11–20	35,222	7,000	4,868	—	—	47,090
" 21–28	40,535	16,820	1,419	1,662	3,975	64,411
Mar. 1–10	45,187	3,094	4,125	1,837	3,172	57,415
" 11–20	75,668	1	1,372	—	1,880	78,921
" 21–31	62,902	10,463	287	1,749	—	75,401
Apr. 1–10	50,678	4,808	619	3,272	2,269	61,646
" 11–20	124,100	7,874	1,740	4,038	1,636	139,388
" 21–30	72,985	—	2,874	6,650	5,176	87,685
Total	717,486*	111,586	28,847	27,987	25,043†	917,949
Per cent. of total	78	13	3	3	3	

* Includes 16,314 troops carried on German ships taken over since the armistice.

† Represents Dutch ships carrying 14,313, Austrian 5,541, Swedish, 2,082 and Spanish 3,107 troops.

PLATE IV.

These past performances combined with collateral information furnish the basis for estimates of future troop-carrying capacity presented in Plate V.

ESTIMATED CARRYING CAPACITY U. S. FLAG TROOP TRANSPORTS—BY MONTH AND TYPE.

The figures show the embarkation capacities in thousands of men it should be possible to offer France for sailings in each month. Carrying capacity obtained from Allied and neutral ships will be additional to that shown below. Estimates revised as of May 14, 1919.

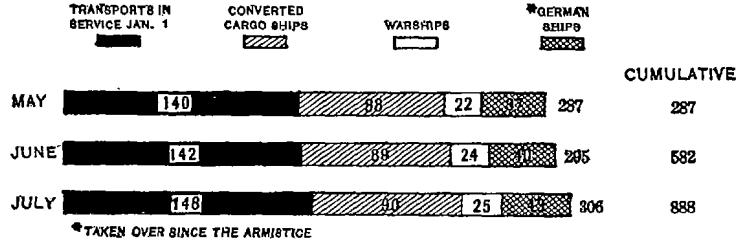


PLATE V.

Plate VI is a particularly interesting example of the methods used to follow the supply of equipment. This diagram deals with aeroplanes of the De Havilland 4 type, serving as a check on estimated production and on the fulfillment of production requirements. In addition, a "Floated" curve shows the number of planes actually loaded on vessels for transportation overseas.

De Havilland 4 Planes.

De Havilland 4 Planes Delivered and Floated to November 1.

Estimated production is based on schedule of July 12, 1918; cabled requirements on incoming cable S.O.S. 208.

Source of information: Incoming cable S.O.S. ‡208; Program and Statistics Department, Bureau of Aircraft Production.

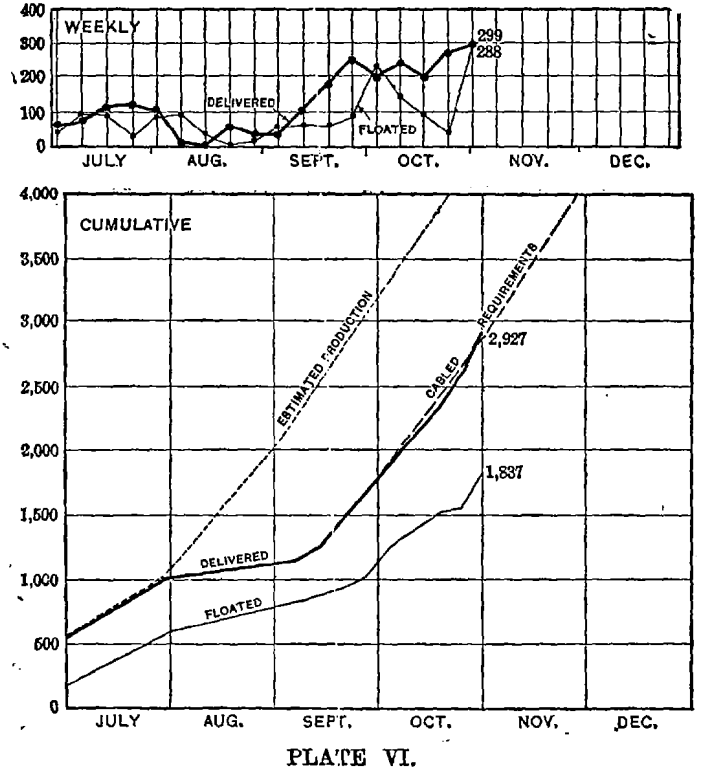


PLATE VI.

Facilities to care for sick and wounded under normal and crisis conditions and the actual use of such facilities are covered by the diagram in Plate VII. A similar diagram was used for hospitals in the United States.

BEDS IN BASE HOSPITALS—A.E.F.

SITUATION, OCTOBER 12.

Source of Information: Statistics Branch, General Staff, S.O.S., A.E.F.

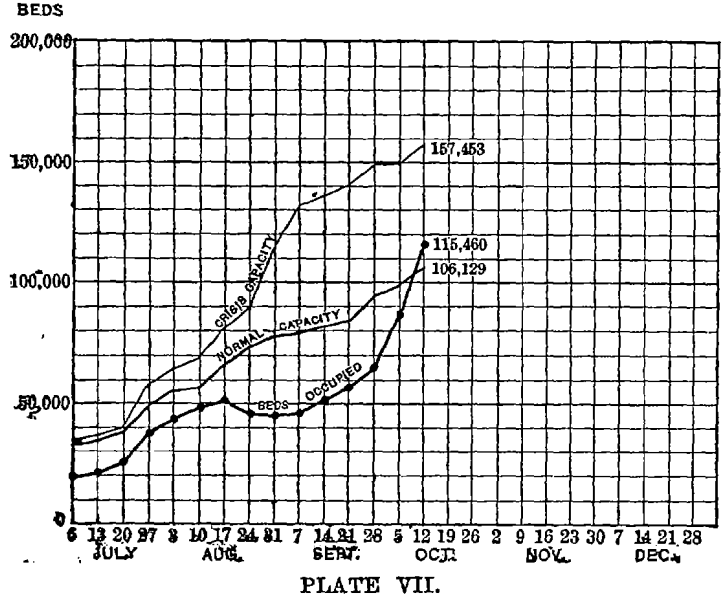


PLATE VII.

Statistics dealing with the health of the army have occupied a place of peculiar importance. The diagrams on this subject, Plates VIII to XI, inclusive, are self-explantory.

Deaths from Disease, Annual Rates Per Thousand, U. S. and A.E.F.

Source of information: Current Statistics Section, and Medical Records Section, Division of Sanitation, Medical Department.

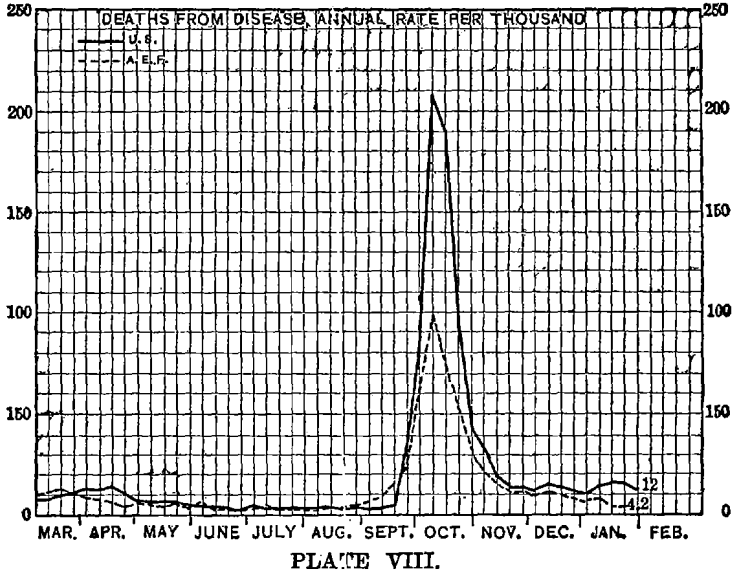


PLATE VIII.

DEATHS FROM DISEASE, BY DISEASES.

Proportion of deaths caused by the more important diseases, computed for 46,836 of the 54,249 deaths from disease which occurred in the Army from the beginning of the war to the latest date reported.

Source of information: Current Statistics Section, Medical Records Section, Division of Sanitation, Medical Department.

Disease.	Deaths.
Pneumonia	38,290
Cerebrospinal meningitis	1,935
Influenza	1,367
Tuberculosis	828
Empyema	458
Typhoid fever	177
Scarlet fever	161
Measles	115
Other	3,505
Total	46,836

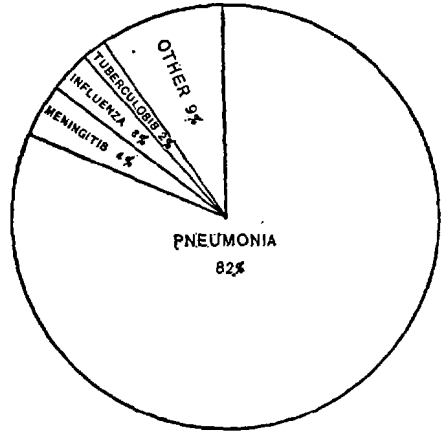


PLATE IX.

New Cases of Influenza and Pneumonia, Total in Army in U. S.

Data from Sanitation Division, S.G.O. Daily from September 19, to October 30, 1918.

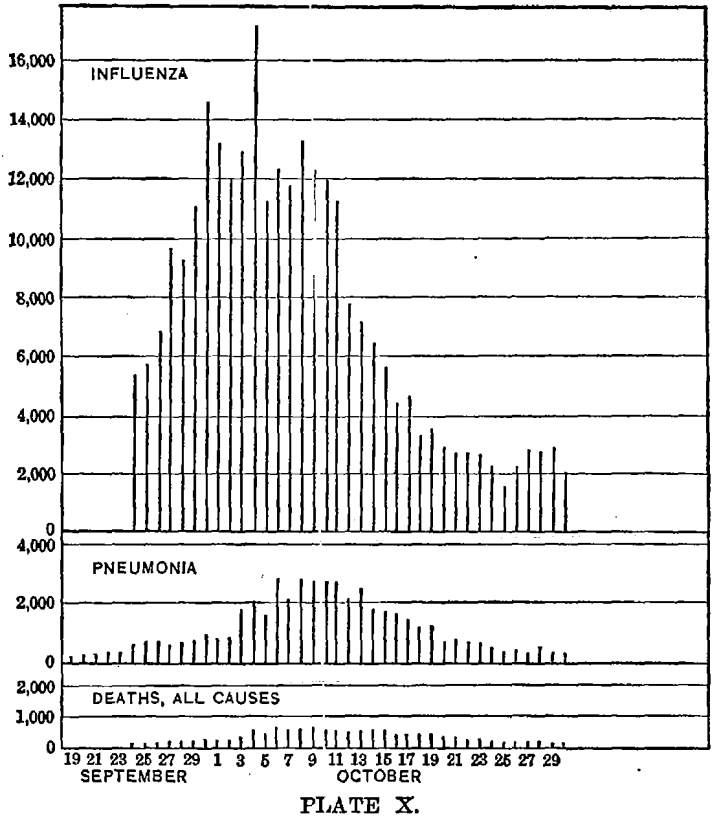


PLATE X.

INCIDENCE OF TYPHOID FEVER IN THE UNITED STATES AND THE A.E.F.

For week ending January 23, 85 new cases of typhoid fever were reported in the A.E.F. The present rate is strikingly high, being greater than has previously obtained in the United States or in the A.E.F. during the war.

Source of information: Current Statistics Section and Medical Records Section, Division of Sanitation, Medical Department.

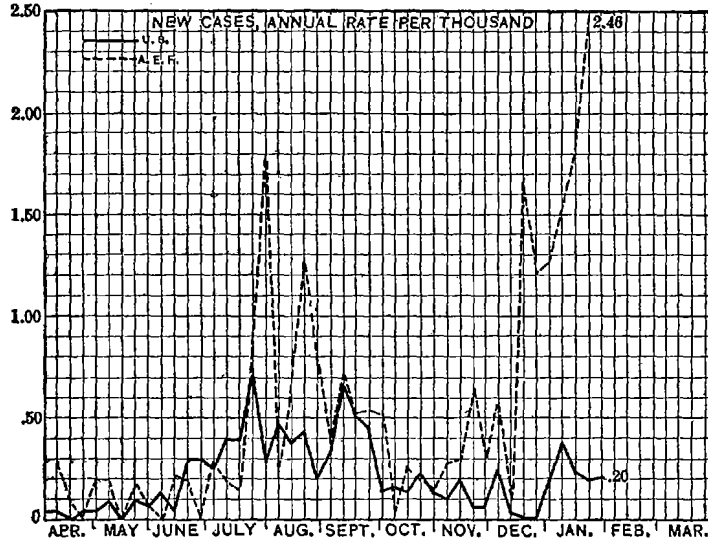


PLATE XI.

Studies are now being made, on the basis of tentative plans, to determine the availability of supplies for the equipment of a standing army. Plate XII details information on items of clothing and equipage.

SURPLUS CLOTHING AND EQUIPAGE IN THE UNITED STATES.

Estimated amounts on hand September 30, 1919, of important items of present clothing stock in the United States and number of years' maintenance of each item for an army of 500,000 men. Requirements to September 30, 1919, figured on the following basis:

1. Stock figures as to February 1, 1919.
2. Actual strength of the Army to May 1, and thereafter 500,000 enlisted men.
3. Rate of consumption as estimated by the Office of the Quartermaster General, September 7, 1918, making no allowance for reclamation.
4. Surplus clothing overseas September 30, 1919, shown in last week's report, not included in this estimate.

	Figures in Thousands.		Years, Stock on Hand Sept. 30 would Maintain 500,000 Men.
	Estimated Requirements to Sept. 30.	Estimated Stock Sept. 30.	
Undershirts, summer	1,250	30,593	20.4
Gloves and mittens, leather	348	8,812	17.6
Drawers, summer	1,250	23,970	16.0
Belts, waist	214	3,588	14.4
Drawers, winter	444	12,998	13.0
Coats, cotton	413	6,362	12.7
Undershirts, winter	444	11,445	11.5
Breeches, cotton	833	9,298	9.3
Blankets, all kinds	426	4,974	8.9
Stockings, wl., light	1,240	21,574	8.6
Coats, denim	323	2,589	6.9
Overcoats	220	1,656	6.6
Boots, rubber	43	323	6.5
Stockings, wl., light	890	15,092	6.0
Coats, wool	426	2,943	5.9
Leggins, canvas	860	5,726	5.7
Shoes, marching	1,291	7,599	5.1
Breeches and trousers, wl.,	860	4,380	4.4
Trousers, denim	426	2,197	4.4
Shirts, flannel	1,291	4,820	3.2
Raincoats, ft. and mtd	426	1,409	2.8
Hats, service	860	2,173	2.2
Puttees, wl., spiral	0	2,618	
Caps, overseas	0	755	NOT ISSUED IN THE UNITED STATES
Jerkins	0	592	
Mackinaws	0	124	

PLATE XII.

Contracts have been placed with a view to our continued participation in active warfare. These are now being cancelled as rapidly as possible in the interests of economy. Progress along this line is shown by the diagram in Plate XIII.

STATUS OF CONTRACTS, BY BUREAS, APRIL 12, 1919.

Value of contract terminations and deliveries in per cent. of contracts outstanding November 9, 1918.

Terminated contracts as shown represent canceled and suspended contracts now in the process of liquidation. The saving that will result from terminations depends on the amount paid contractors in settlement.

Only 9 per cent. of the contracts in effect November 9, 1918, now remain outstanding.

Source of information: Office of the Director of Purchase and Storage; Office of the Director of Army Air Service; Ordnance Department.

PER CENT. OF CONTRACTS OUTSTANDING NOVEMBER 9, 1918.

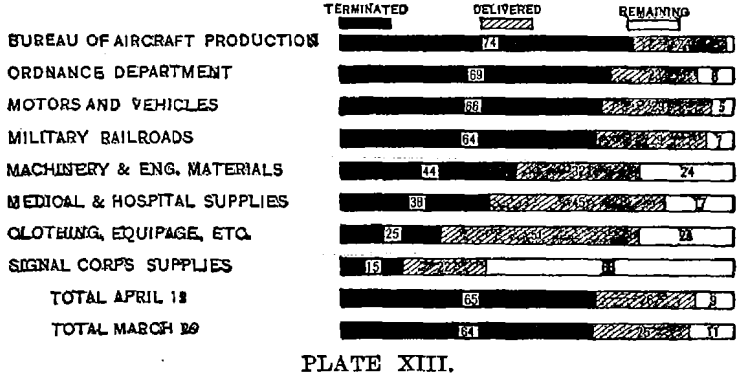


PLATE XIII.

Transatlantic tonnage under army control increased rapidly from the beginning of the war and decreased rapidly after January 1, 1919. Plate XIV shows the development of the fleet as a whole and the relative development of various classes of tonnage.

Transatlantic Tonnage Under Army Control—by Month and Type.

Total tonnage under Army control exclusive of Cross-channel Service and British Loan.

Cargo ships authorized for release are regarded as out of operation upon arrival in home ports. Similarly, cargo ships for conversion to troop ships are classified as troop ships upon arrival in home ports.

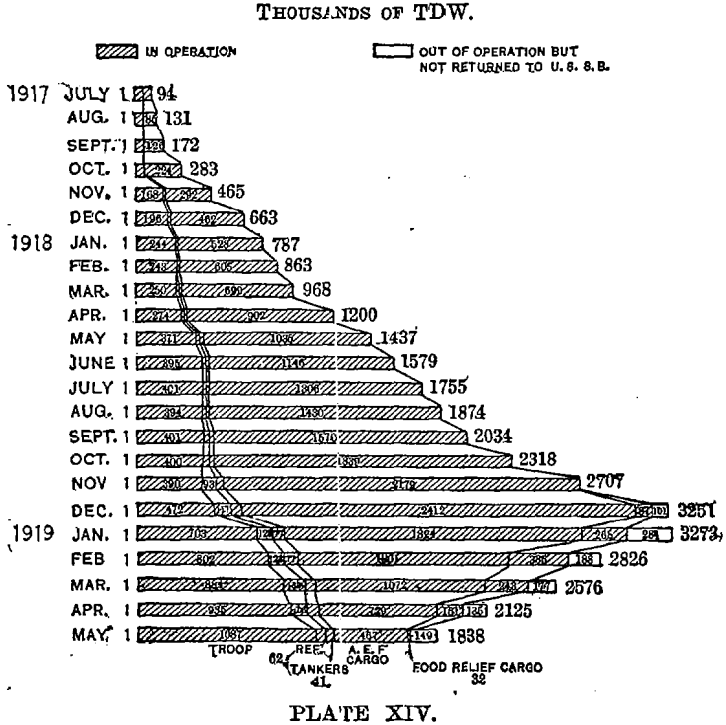


PLATE XIV.

The relation between shipping tonnage lost and built during the war was carefully followed, for on the net results of these two opposing factors depended in large degree the ability of the United States and the Allies to maintain forces at the front. Plate XV presents the situation from month to month.

ALLIED AND NEUTRAL SEAGOING TONNAGE—LOST AND BUILT.

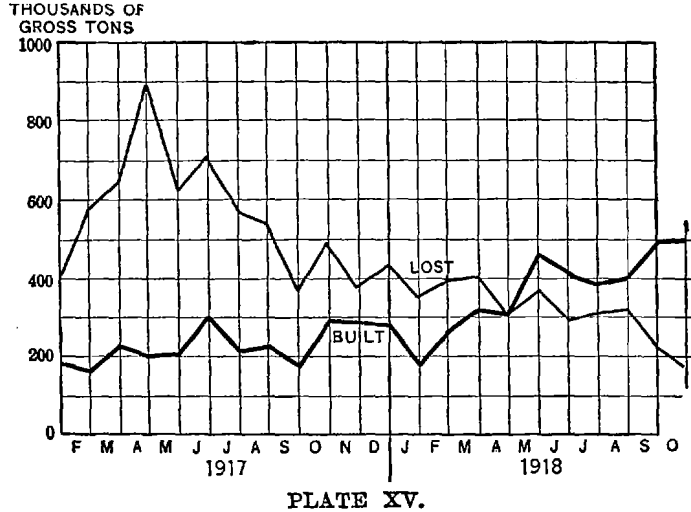
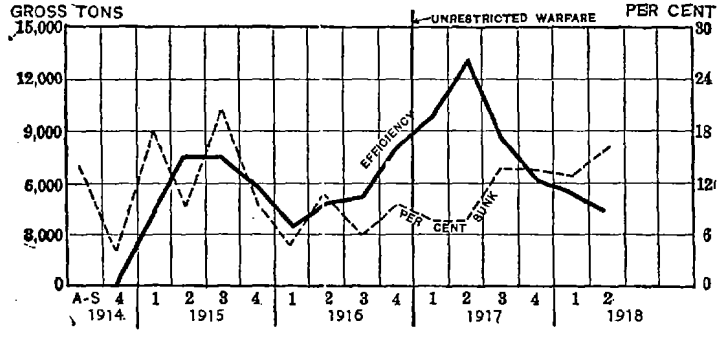


PLATE XV.

The curbing of submarine effectiveness was a large element in the reduction of tonnage losses. This was done both by destroying submarines and by developing means of protection from their activity. Plate XVI indicates the success of efforts in these directions and their relation to the declaration of unrestricted submarine warfare by Germany.

PER CENT. OF SUBMARINES SUNK *vs.* MERCHANT TONNAGE SUNK PER SUBMARINE.

Number of submarines sunk per 100 available at beginning of period and gross tons of merchant ships sunk by submarines per submarine available at beginning of period.



Period.	Submarines Sunk per 100 Available.	Tonnage Sunk per Submarine Available.
1914—Aug.-Sept.	14	
4th	4	113
1915—1st	18	4,010
2d	9	7,590
3d	21	7,610
4th	10	5,930
1916—1st	5	3,620
2d	11	5,000
3d	6	5,350
4th	10	8,280
1917—1st	8	9,940
2d	8	13,200
3d	14	8,560
4th	14	6,260
1918—1st	13	5,410
2d	16	4,420

PLATE XVI.

As an aid in determining the force which could be maintained overseas as estimate was made of the amount of cargo it would be possible to ship each month to January, 1920. This estimate is graphically presented in Plate XVII.

CARGO THAT CAN BE LIFTED FOR THE ARMY—THOUSANDS OF SHORT TONS—SEPTEMBER, 1918, TO DECEMBER, 1919.

These figures are taken from "An Estimate of Tonnage Available for the Transport of Trans-Atlantic Army Cargo," by Donald Scott, Central Bureau of Planning and Statistics. The figures are based on the estimates of probable ship production given in charts, pages 61 and 62, of this report, and on the maintenance of our essential import services. The estimates allow for enemy action and marine losses and basic turnarounds of 70 days for old ships and 77 days for new ones. The turnaround figures are increased by 10 per cent. during the winter months and six additional days are allowed for ships going to Marseille. Ships over 5,000 TDW are assumed to lift 66 per cent. of their TDW; ships under 5,000 to lift 55 per cent.; and ships in animal service to lift 46 per cent. of their TDW.

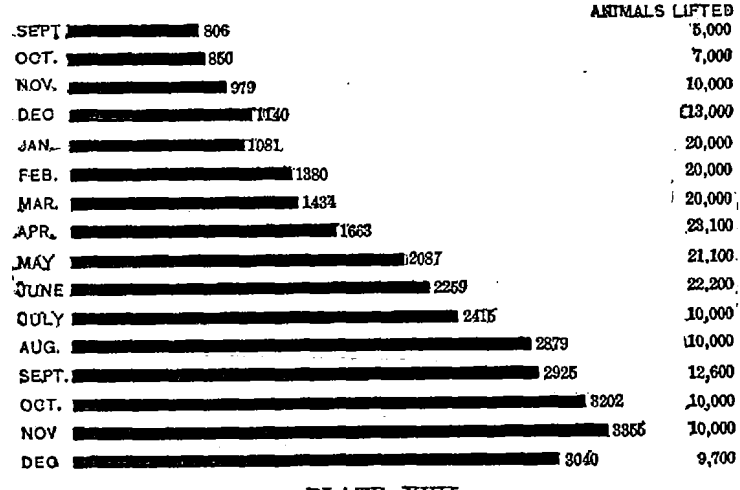


PLATE XVII.

There are two principal indices of efficiency in the operation of ships, amounts carried on each trip and rapidity of movement. Given ideal conditions a cargo ship can be loaded to carry about 75 per cent. of her deadweight tonnage. Plate XVIII shows the percentage of deadweight tonnage actually carried by month, indicating that efficiency of loading was at its highest point during the time of greatest pressure for the shipment of supplies.

PER CENT. OF TDW LIFTED BY CARGO TRANSPORTS—BY MONTH.

The figures represent the percentage that the long tons of cargo were of the total deadweight. Small transports for cross-channel service, refrigerators, British loaned ships, and Food Relief ships are excluded.

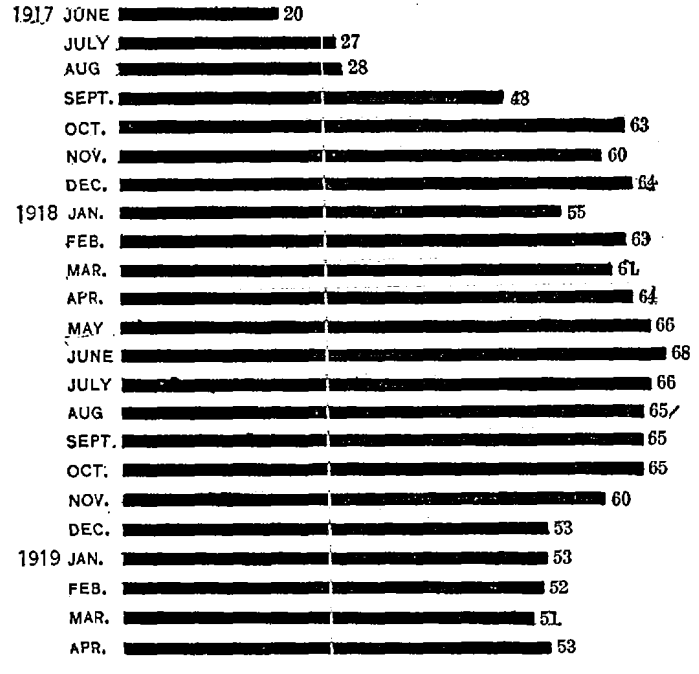


PLATE XVIII.

The rapidity of movement of ships as an index of efficiency is made the basis of the diagrams in Plates XIX and XX. The "turnaround" represents the time elapsing between two departtures from the United States. The "stay in port" represents the time elapsing between entrance to, and departure from, a port.

TURNAROUNDS OF ARMY TRANSPORTS.

Effective average in days for the last ten ships sailing in each weekly period. The effective average represents the harmonic mean.

On March 24, the first 4 converted cargo ships to sail from U. S. ports had completed turnarounds with an effective average of 42 days; on March 31, 8 such ships had completed turnarounds with an effective average of 45 days.

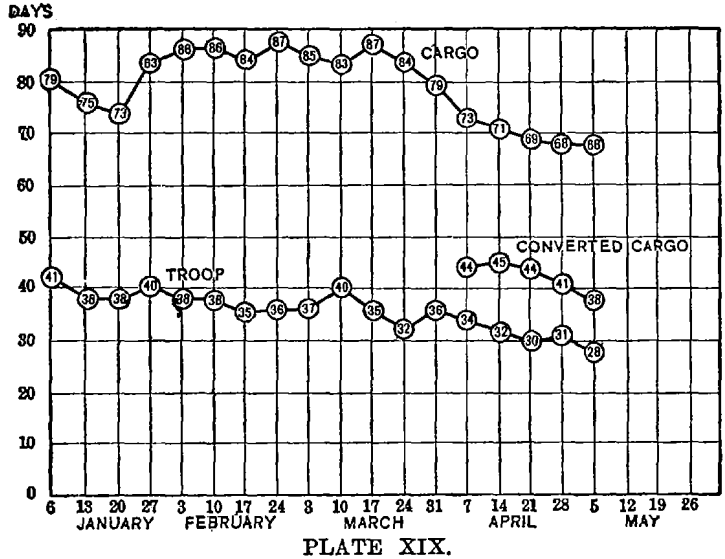


PLATE XIX.

AVERAGE STAYS IN PORT OF ARMY TRANSPORTS.

Days Spent in Port by last ten ships to leave in each Weekly Period.

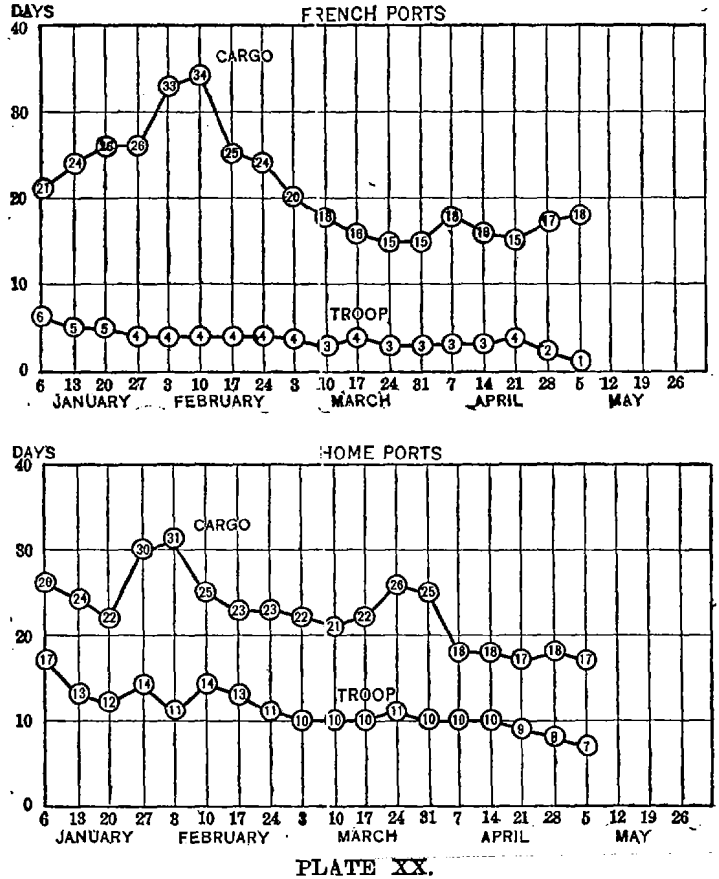


PLATE XX.

No attempt has been made to deal with the practical operations of which the diagrams presented are a history and for which they served as a guide. It has rather been attempted to indicate, by concrete examples, the methods through which the Statistics Branch of the Army contributed to the efficiency of centralized control of military operations. The Branch has acted as a coördinating and guiding agency in a task which would have been, if not impossible, certainly much more difficult without its help.