

ARMY INDUSTRIAL COLLEGE.

Washington, D.C.

FACULTY REPORT.

Second Course, Sept. 2, 1924 to Feb. 2, 1925.

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February 14, 1925.

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I N D E X.

F A C U L T Y R E P O R T.
Army Industrial College.

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FACULTY REPORT.

ARMY INDUSTRIAL COLLEGE.

(Second Course, Sept. 2, 1924 to Feb. 2, 1925)

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1. The Second Course of the Army Industrial College occupied the period September 2, 1924 to February 2, 1925, inclusive. The following thirteen officers constituted the Class:

- ✓ Lieutenant Colonel Wm. G. Ball, Q.M.C.
- ✓ Lieutenant Colonel Robert Davis, S.C.
- ✓ Major Lucius L. Hopwood, M.C.
- ✓ Major Clifford L. Corbin, Q.M.C.
- Major H. H. Arnold, A.S.
- Major James W. Lyon, C.W.S.
- Major R. R. Nix, Ord.
- Major Cherubusco Newton, Fin.
- Major Wm. A. Borden, Ord.
- Major Edwin G. Kelton, C.E.
- Captain T. J. Hanley, A.S.
- Captain Wilbur S. Elliott, Q.M.C.
- Captain Vennard Wilson, Ord.

2. All of the above finished the course and were duly graduated on February 2, 1925.

3. Instruction was given chiefly by the "case" method. Problems were issued outlining the ground to be covered and giving references to orient the student. In all, twenty-eight problems were given to the class. Copies of these are appended. (Appendix No. 1). It was impracticable to have each student work all problems. The problem assignments are shown by the chart attached, (Appendix No. 2).

4. After the solution of each problem by the students to whom assigned, a conference was held, attended by the entire student body and the faculty, and very free discussion had concerning all points raised. In this way it is believed that the maximum benefit was obtained by the interchange of ideas and the consequent tendency towards a uniformization of thought between the representatives of the several branches. This, of course, creates a tendency toward uniformity of procurement practices in the branches.

5. The following is an outline of the course given:

<u>Problems.</u>	<u>Subject.</u>	<u>Scope.</u>
1 & 2.	Orientation.	Laws and Regulations affecting office, A.S.W. Organization of offices of A.S.W. & Branches. Selected general references bearing on industrial phases of the World War and the post war ¹⁹ organization of the War Department.
3 & 4.	Orientation - Control and Planning in Industry.	Selected references to standard literature and periodicals. Reports concerning certain large corporations made by officers from office, A.S.W., after visiting the plants and securing data concerning their organizations and management.
5 & 6.	Requirements.	A general study of the bases upon which the computation of requirements is made and the actual computation of requirements for a specific item.
7.	Resources.	Committee studies of the comparative resources of the Philadelphia and Chicago industrial districts.
8.	Requirements.	Committee study and preparation of a chapter on "Requirements" for a proposed "Procurement Manual".
9.	Labor.	A committee study of the labor situation which would confront the United States in the event of war.
10.	Power.	A committee study of the power situation which would confront the United States in the event of war.
11.	Transportation.	Committee study of transportation situation which would confront the United States in the event of war.
12.	Allocation of Facilities.	A general study of the method of allocating facilities.

<u>Problems.</u>	<u>Subject.</u>	<u>Scope.</u>
13.	Conservation.	A general study of the subject of conservation in the event of a major emergency.
14.	Priority.	A general study of the system of priorities which should be set up in a major emergency.
15.	Price Control.	A general study of the system of price control which should be set up in a major emergency.
16.	Funds for Procurement.	A study of the methods of submitting estimates and obtaining funds for procurement.
17.	Commodity Committees.	A study of the function of commodity committees in the plan for war time procurement.
18.	Interbureau Procurement.	A general study of the problem of interbureau procurement, including planning therefor.
19.	Personnel and Training.	A study of the plans for obtaining and training personnel for procurement in war in the supply branches.
20.	War Time Procurement Plan of the War Dept.	A study of the existing procurement plan on file in the office of the Assistant Secretary of War.
21.	Group War Plan.	A study of war planning for groups of items of issue.
22.	War Time plans of Supply Branches.	To familiarizw students with the procurement plans of other than their own branches.
23.	Commodity Studies.	Committe studies of assigned commodities, Copper, Rubber and Wool.
24.	Procurement Plan for a Specific Item.	The preparation of a procurement plan for an assigned item of issue.
25.	Flow Charts.	Preparation of a flow chart for an assigned item of issue.

<u>Problems.</u>	<u>Subject.</u>	<u>Scope.</u>
26.	Budget ^a ory Control and Accounting.	A study of methods of budget ^a ory control and accounting used in industry and their applicability.
27.	War Reserves.	A study of the general principles upon which war reserves should be based.
28.	Procurement Manual.	The preparation of an outline for a Procurement Manual.

Lectures were given to the class as follows: *Except where paging is given, these are not available.*

1924

September

- 2. Opening Exercises. Addresses by Col. Dwight F. Davis, Assistant Secretary of War, and Maj. General Chas. McK. Saltzman, Chief Signal Officer.
- 4. Address, "Duties of the Assistant Secretary of War and his relations with the General Staff and the Supply Branches", Lt. Colonel J.D. Fife, M.C., Chief, Planning Branch.
- 16. Lecture, "Specific War Plan for Anti-Aircraft Guns", Major W.C. Young, Ord. Dept.
- 19. Lecture, "Organization and Purchase System of the Pennsylvania Railroad", Col. Chas. D. Young, ORC-CE. (General Purchasing Agent of the P.R.R.)
- 23. Lecture, "Specific War Plan for Pack Carriers and Canteens", Lt.Col. R.E. Smyser, Q.M.C.
- 30. Lecture, "Specific War Plan, Procurement of Pontoon Equipment", Capt. Theodore Wyman, Jr., C.E.

October

- 14. Lecture, "Power Survey of the United States", Major G.R. Young, C.E.
- 24. Address, "Procurement of Non-Commercial Material in War", *P. 125* Maj. General C.C. Williams, Chief of Ordnance.
- 27. Conference on "Power", Major C.R. Pettis, C.E. (Planning Branch).
- 29. Conference on "Labor", Lt.Col. J.D. Fife, M.C. (Planning Branch).
- 31. Conference on "Transportation", Maj. C.R. Pettis, CE. (Planning Branch).

November.

- 3. Conference on "Allocations", Lt.Col. Geo. E. Kump, S.C., Asst. Director, Army Industrial College.
- 6. Address, "Procurement of Commercial and Semi-Commercial Material in War", Maj. General W. H. Hart, Quartermaster General.
- 10. Conference on "Priorities", Maj. R.H. Somers, Ord., Executive Officer, Army Industrial College.
- 21. Lecture, "The Work of the American Engineering Standards Committee", Dr. P.G. Agnew, Secretary, A.E.S.C.

December.

- 10. Lecture, "Alcohol", Dr. H.S. Rubens, President, U.S. Industrial Alcohol Company.
- 11. Conference on "Strategic Raw Materials", Major J. K. Clement, Ord., (Planning Branch).
- Lecture, "Power", Gen. Chas. Keller, Ret'd.
- 16. Lecture, "Factory War Plan of Edgewood Arsenal", Capt. E.F. Koenig, C.W.S.

1925

January.

- 6. Address, "Philadelphia Quartermaster Intermediate Depot Manufacturing Plan", Col. W.S. Wood, Q.M.C.
- 14. Lecture, "Organization and Functions of the Office of the Assistant Secretary and the War Industries Board at the beginning of the World War", Mon. Benedict Crowell.
- Short Talk, Mr. Bernard M. Baruch.
- 15. Lecture, "Organization of the War Industries Board", Colonel Frank A. Scott, Ord-ORC.
- 19. Address, "Geographical Aspects of the Production and Consumption of Crude Rubber", Dr. H.W. Whiteford, Chief, Crude Rubber Section, Department of Commerce.
- 20. Lecture, "War Plan of Frankford Arsenal", Col. Odus C. Horney, Ord. Dept.
- Lecture, "Manganese", Maj. G.A. Roush, SS-ORC., Associate Professor, Metallurgy, Lehigh University.
- 21. Lecture, "Tungsten", Maj. G.A. Roush, SS-ORC.
- 22. Lecture, "Mercury and Platinium", Maj. G.A. Roush, SS-ORC.
- 23. Lecture, "Nickel & Tin", Maj. G.A. Roush, SS-ORC.

February

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Graduating Exercises. Addresses by Honorable John W. Weeks, Secretary of War, and Maj. General Merritt W. Ireland, Surgeon General.

7. Toward the completion of the course comments and criticisms were requested from the student officers. On account of the fact that the Third class was to enter on the day of graduation of the Second class, early comment was requested on problems numbered 1 to 4, so that the corresponding problems could be prepared for the Third class. General comment on the entire course was turned in later. This explains the apparent duplication in criticisms which appears.

All criticisms have been arranged according to subject matter and such quotations as are pertinent appear below. The criticisms on each subject are followed by "Faculty Comment", which indicates the steps proposed to be taken to change the conditions referred to.

THE COURSE - GENERAL.

"The course is developing along proper lines. The course is quite long enough to teach the principles involved and to impress upon student officers the importance of the subjects and the general manner of application.

It would seem good business to keep the present class or such part of them as have shown aptitude for a further six months, dividing the class up into commodity committees to draw up a detailed plan on some commodity or articles common to two or more branches. Upon completion of this, plan could be submitted to the Chiefs of branches as a study and would be of material aid to them in their planning.

It seems that officers have been and are being detailed in the office of the Assistant Secretary of War and while on duty there are being detailed to take the course. It is recommended that an officer should complete the course before being eligible for detail in the office. This would give the Assistant Secretary an opportunity to pick officers who have shown special aptitude.

It is recommended that the course be changed at once to a year's course; the first five months to be devoted

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to instructions and the remainder of the year to the practical application of the principles taught. In this manner two classes could graduate each year. At all times one would be receiving instructions while the other would be putting into practical application the results of their studies."

-----Maj. C.L. Corbin,
Q.M.C.

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"Reference your memorandum of January 5, 1925, calling upon each student officer to submit suggestions for changes in the above mentioned problems (1 and 2), the writer thinks that for the first problem in the course the subject of "Orientation" was well taken as very few students, if any, have any knowledge when first beginning the course of what it is all about."

----- Maj. C. Newton,
Fin. Dept.

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"It is believed that more problems should be given to cover subjects on special assignments and resource studies which are at present in the formative stage and are being worked up separately by personnel in the office of the Assistant Secretary of War. A good example is the recent problem No. 28, on the "Procurement Manual". All these subjects are given in our "office assignment" and some of those in which I am particularly interested follow: New Facilities; Conversion; Machine Tools, Gauges; Educational Orders; Factory Storage; Vanadium; Titanium."

"It is again suggested that students should be encouraged by appropriate references to delve deeply into the War Industries Board files."

----- Maj. R.R. Nix,
Ord. Dept.

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"More time should be allowed for the first two problems in order to permit the officers to read all the references. The time on these two problems was too short, resulting in the fact that many of the student officers had not seen the Industrial War Plan of the Assistant Secretary's office. More copies of that plan should be made up and it should not be considered so extremely confidential. Some

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of the confusion on the minds of the branches is due to the fact that they do not know the contents of that plan and hence are working in the dark. Also, the work of the students throughout the course is hampered by the lack of an adequate number of copies.

I think that the method of using student officers to report on the progress of the branches in war planning should be used with care. It would be very easy to get the school unpopular if the "spying" done by the student officers is not guarded carefully. Incidentally the position of the officer in his own branch might suffer from open, frank impressions that he has given in his reports if these are used as a basis of further correspondence by the Assistant Secretary with the Chief of branch.

More time should ultimately be devoted to the study of industrial organization and methods of control used by the large industries of the country. Further, studies should be made by the officers on duty in the office of these methods. For instance, I think that an erroneous opinion of the centralized purchasing activities of industries was obtained from the study of the ten organizations which have been the subject of monographs. The organization of some companies such as the Stone and Webster, Geo. M. Fuller, and other large contracting companies, should be made."

"As soon as possible make the school self-sustaining in matter of clerical help, textbooks and information such as must at present be obtained from the branches. An endeavor must soon be made to cut down on the time and energy that is taken from the officers on duty in the planning sections of the branches. If not, the school is apt to become known as a "pest"."

"Continue the present method of making the work of the students useful to the progress of the office and to the branch.

On the whole I consider that the course has been excellently worked up, has been of great benefit to me and to the others in the class. The above suggestions are given in the hope that they may help to make the course even better than it is at present."

----- Maj. E. C. Kelton,

C. E.

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"This part of the course does not seem to be complete. (Orientation). I get a good idea of the working of the Office of the Assistant Secretary of War in war time, but I do not know how it works in time of peace. It seems to me that it would be very important in the early days of the war to continue and finish the projects under way, or to dispose of them without legal and financial difficulties. To do this, the officers placed in positions of authority should know what is going on and how it is being done. I would suggest that each officer understudy the chief of each section for a period of one week, for the purpose of familiarizing himself with the workings of the office.

Following the same idea a little further, each student should follow through his own branch the procurement of at least one article, from its design and adoption, to its use by the troops."

"Another question which I have discussed with several other students is that of the organization of the Federal Government. There are a great many departments which touch the Army in one or more places, such as the Veterans Bureau, and other Departments such as the Attorney General which often handle questions in which the Army is interested. Why not make a study in the early part of the course of these departments so that questions arising later can be properly disposed of?"

----- Capt. T.J. Hanley,
A.S.

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"Considering the course as a whole, in general, it is indeed very satisfactory and instructive, and therefore there is little necessity for criticism, constructive or otherwise".

----- Capt. W.S. Elliott,
Q.M.C.

FACULTY COMMENT:

It is thought highly desirable to make the course a full academic year in length as soon as practicable. It is hardly practicable to overlap the classes in the manner outlined by Major Corbin, and it is believed that the present commodity committees will better serve to accomplish the object desired.

It is thought distinctly not desirable to make up an "eligible list" of graduates from which all details to procurement planning work

should be made. There are three vital objections to this:

- (1) The College should not need this protection. If its graduates do not get enough from the course to make them especially valuable to their branch chiefs for such assignments, it has failed in its mission and should be discontinued. If branch chiefs fail to make proper selections for detail, all things considered, the "eligible list" is not the proper solution.
- (2) It would be very bad for the general esprit, to make it impossible for an officer, perhaps of splendid attainments and large experience, to be detailed on procurement duty merely because, through no fault of his own, he has not had the chance to take the course. The graduate will naturally always have an advantage over the non-graduate, other things being equal. If, under these circumstances, the non-graduate appears the better selection for a given position, he should have it.
- (3) No artificial restriction should be placed in the way of branch chiefs and others who are charged with fitting available personnel to existing demands. The problem is difficult at best and the sole criterion should be the best interests of the service, all things considered. This may, and frequently will, mean that the best man for a particular position cannot be put in that position because he is also the best for another and more important one.

Referring to Major Nix's comment, it is intended to enlarge the scope of the course to include additional subjects after it is increased in length. At the present time, it is impracticable to do this.

Additional time is not available for the first two problems, as suggested by Major Kelton. His suggestion that the use of student officers to report on the progress of the branches should be exercised with care, and is thoroughly concurred in. In order that the branches shall obtain directly whatever of value there may be in the work of the student officers, it is proposed to have them turn in to their respective branches one copy of each solution submitted to the problems issued.

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It is appreciated that more time should be devoted to the study of industrial organizations and methods of control. This cannot be done until the length of the course is increased. Still less can be time given to the organizations of other government departments.

COURSE - ARRANGEMENT OF.

"The student will be better fitted to solve Problem No. 6 after he has finished problems 7-8-9-10-11 and 14. Suggest that order be changed to 5-7-8-9-10-11-14-6-12.

Substitute for Problem 22 another requirement of specific item problem. In this problem have students make a complete study of the item, including requirements and procurement planning as in problem no. 24. The above suggestions are made with a view of making the course more interesting and also more logical from the student's viewpoint. By giving the student a specific problem from his own branch to work out, this work seems to be more beneficial to him personally, and also he has something tangible to do."

----- Maj. H.H. Arnold,
A.S.

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"Problem 6 on the Computation of Requirements of a specific item, Problem 25 on the Preparation of a Flow Chart of a specific item and Problem 24 on the Procurement Plan of a specific item should be given in the order indicated in consecutive weeks and should cover the same specific item. The item chosen should be indicated by the supply branch from which the officer is assigned and the effort of the officer should be to assist his branch in the work he undertakes on the item assigned him. I believe this would be of benefit not only to the student but to the branch as well. By using the same item for each problem it would enable the student to give more time to each phase of the problem than is possible where different items are assigned. The three problems are related and to properly complete problem No. 24 it is necessary to work as specified in Problems 6 and 25."

----- Maj. Wm. A. Borden,
Ord. Depts

FACULTY COMMENT:

The course is being entirely rewritten for the Third Course.

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Revised course is outlined later in this report.

COMMITTEE REPORTS.

"That there be no committee reports. The writer's experience was that committee problems were seldom, if ever, solved by the committee as a whole but that each member of the committee wrote on some particular phase of the problem and without question his remarks were accepted by the committee as a whole."

----- Maj. C. Newton,
Fin. Dept.

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"Committee reports were generally unsatisfactory. These should be held to a minimum and used only when the work is clearly divisible or when time permits co-ordination of the individual results of the members of the committee. Except where data had to be worked up, the bulk of the reports generally devolved upon one man."

----- Maj. Wm.A. Borden,
Ord. Dept.

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"While committee work might be desirable from the point of view of the Director, it is believed that the student gains much more from work on individual problems. Therefore, recommend that there be a cut in the number of committee problems."

----- Capt. W.S. Elliott,
Q.M.C.

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"Committee problems, although very valuable, are not very instructive to those who are not on the committee. It is recommended that either the number of these problems be reduced, or that a number of committees be assigned the same subject, which would lead to some interesting comparisons of the results obtained and reduce the time required for presentation of the problems."

----- Capt. V. Wilson,
Ord. Dept.

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FACULTY COMMENT:

The criticisms of committee work made above are based, it is believed, largely because an insufficient time was allowed for the solutions of many of the committee problems given out. This belief has been confirmed by conversations with the student officers of the last class.

As far as constructive value is concerned, the work done by committees has been distinctly superior to that done by individual officers. Accordingly, it is proposed to increase the length of time for the preparation of committee reports to from two to four weeks.

CONFERENCES.

"More frequent conferences conducted by the instructors and other officers on duty in the Planning Section of the office of the Assistant Secretary of War."

----- Lt. Col. Davis,
S.C.

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"That the Saturday conferences be confined to short discussions and a criticism of the problems of the previous week by the instructor".

----- Maj. J.W. Lyon,
C.W.S.

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"The Saturday morning conferences are a bit tedious. I would suggest that no papers be read. I recommend that one man be designated to discourse on a problem and then the other members of the class be allowed to discuss points of difference only. The length of time allowed for presentation of the problem and discussion should be indicated and held to."

----- Maj. W.A. Borden,
Ord. Dept.

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"Many of the conferences were wasted time. The papers were too long to be kept in mind, and the general discussion which always followed was confused by irrelevant questions. I suggest that the papers be turned in and mimeographed and distributed to each student. Questions

can then be written out and submitted to the author through the faculty who can eliminate any unnecessary ones. Then a conference can be held and all questions answered after due consideration."

----- Capt. T.J. Hanley,
A.S.

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"To reduce the time required for the conferences and to give students practice in delivery of papers, it is suggested that a number of the problems be presented in the manner of an informal address."

----- Capt. V. Wilson,
Ord. Dept.

FACULTY COMMENT:

Steps are being taken to reduce the amount of time spent in conferences. It is also planned to have many subjects presented in the form of informal talks instead of having the papers submitted read. In the case of committee reports, it is planned to have these mimeographed and distributed to all student officers prior to the conferences so that they may be read and student officers prepared to discuss them intelligently.

CURRENT PROCUREMENT.

(Submitted Feb. 9th, 1925).

"To the Director of Procurement:

1. The discussion in conference of the class on the duties of the Assistant Secretary of War and organization of his office was confined to the War Organization of his office and its functions in supervising war procurement. The activities of the Assistant Secretary in supervising current procurement were not discussed on the grounds that it was a small and unimportant problem compared to the formation of a War Plan and the proposed organization for supervising and coordinating procurement under this plan.

2. Since completing the course and reviewing the many thoughts and ideas acquired during the school course, I find myself asking, "Why this lack of interest in supervision and coordination of current procurement?" One principle impressed on the students was that a good organization was one that in case of emergency could expand rather than assume new duties and change its organization.

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I am impressed with the need of coordination of current procurement in a business like way by the office of the Assistant Secretary instead of the operating control now exercised over the procurement branches by the General Staff.

3. If the present system were to continue until an emergency occurs, the system of General Staff control would be so firmly established that an abrupt change to coordination by the Assistant Secretary would undoubtedly result in a somewhat dual control which is in principle absolutely fatal.

4. The National Defense Act charges The Assistant Secretary with the supervision of the procurement of all military supplies and other business of the War Department. It seems to me that by assuming the duties in an active manner charged to him by law that much benefit would result:

- a. In developing an organization to handle supervision,
- b. In developing a satisfactory system of inter-bureau procurement in time of peace that would function in time of war,
- c. In creating among procurement officers a feeling and knowledge of the benefits to be derived from coordination and supervision of procurement.
- d. In standardization of specifications.
- e. In assuring as far as possible commercial specifications.
- f. In developing an organization that in case of emergency need only expand to put into effect the supervision of procurement contemplated in the War Plan.

5. I recommend that consideration be given to the enlargement of the office of the Director of current procurement with real powers as defined by law; and that he have in his office a representative of each procurement branch, officers who have the confidence of their branch chiefs and who could act as liaison officers and advisors on problems relating to their respective branches. These officers could also act as a committee on problems affecting all branches. I believe some such organization would be of real advantage and material benefit in securing coordination and cooperation that would insure supervision by the Assistant Secretary easy and successful when the emergency arises."

-----Maj. C.L. Corbin,
Q.M.C.

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FACULTY COMMENT:

This is a matter on which the Faculty is inclined to agree with Major Corbin.

LECTURES.

"The thought is that the course might with profit carry a considerable augmented program of lectures. This for several reasons - lectures by men well known and speaking with authority, utilize and make concrete problems otherwise of more or less academic interest; they also increase the range of the subject and are likely to make possible its better and more comprehensive understanding by the student. Further, they conserve time."

----- Maj. L.L. Hopwood,
M.C.

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"While recognizing the great value of lectures, I believe that the work of students should be interrupted as little as possible with such lectures - that if certain lectures will benefit the students, such lectures be arranged so as to fall on certain fixed days; that students be not required to attend lectures more than on one day of each week. To the writer it is believed that to attend three lectures on the same day would less interrupt students than to have to attend three lectures on three separate days."

----- Maj. C. Newton,
Fin. Dept.

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"More explanatory lectures are needed in the first weeks of the course."

----- Maj. Wm. A. Boden,
Ord. Dept.

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"The work of the General Purchasing Agent, A.E.F., should be studied in more detail and its importance in the method of control used there should be stressed by a lecture on the methods used by the General Purchasing Agent. This lecture should be

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given by some officer who was on duty in that office
or by General Dawes."

----- Maj. E.C. Kelton,
C.E.

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"It is further believed that if it can be conveniently
worked out, to have not more than two lectures a week
and never more than one in the same day will materially
improve the work on the student's problems."

----- Capt. W.S. Elliott,
Q.M.C.

FACULTY COMMENT:

It is planned to continue lectures on about the same basis as
heretofore.

LIBRARIES.

"Also it might be of advantage to give some instruction
on how to find essential facts from research libraries
and to give a list of the libraries, their locations,
and the kind of information^tBe found in them."

----- Lt.Col. W.G. Ball,
Q.M.C.

FACULTY COMMENT:

This recommendation is not concurred in, due to lack of time
and the relative greater importance of other matters.

ORIENTATION.

"It is believed that it would be of advantage to the
students if an illustrative problem were presented
to the class as a whole, some time before they were
required to attempt a solution, and that a satis-
factory solution should be presented to the class
after a problem is solved."

----- Lt.Col. W.G. Ball,
Q.M.C.

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"My previous recommendation on this subject is re-
iterated, namely, that the references given, if

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considered practicable, show that which is essential and that which is desirable reading. It is thought that by so doing much time will be saved to a student officer floundering about in efforts to find his bearings.

As a further aid in "orientation" it is suggested that immediately following the beginning of a Course a lecture be given the class covering the general field of War Department organization, including the office of the Assistant Secretary; also, the Basic Mobilization Plan and the inter-relationship of the different appendices and annexes. In this manner the student officer will more early in the course become familiar with the work at hand."

----- Maj. L.L. Hopwood,
MC.

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"Have one lecture early in the course in which the duties of the Assistant Secretary of War's office and the Supply branches are outlined in more or less detail to give the student a more complete idea as to what it is all about. The mere studying of existing orders and regulations does not do this. He wants to know, in a general way, how each separate function fits in with the others."

----- Maj. H.H. Arnold,
A.S.

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"It is suggested that the problem on making an organization chart of the War Department be preceded by a problem or study of standard books on organizations and charts."

----- Maj. J.W. Lyon,
C.W.S.

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"More reading matter is required to be covered than can profitably be digested in the first week. It is suggested that this reading be distributed more equitably over the course. This bulk of references creates a tendency for the student to read the minimum amount necessary to solve the requirements without the proper amount of essential reading.

Where there are not enough copies of particular references to go around, the references might be circulated throughout the class (using regular slips) with a time limit for each student."

"Problem No. 2: Add to Requirement: The report should be submitted in narrative form, intelligible to the average reader, explaining inter-relations of each division, branch and section of these offices and the mission and function of each.

Very early in the course a lecture for the purpose of orientation would be helpful and students should be encouraged to delve into the sources in their research work, particularly the files of the War Industries Board."

----- Maj. R.R. Nix,
Ord. Dept.

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"However, it is believed that the object of Problem No. 1 instead of being "to learn the duties and functions of the office of the Assistant Secretary of War, exactly where it fits in, in the general scheme, and something of its historical background" might well be changed to the object of the giving the student a general idea of the many and varied problems concerning the procurement of supplies which confronted the War Department during the World War; of the problems which will likely arise in a future war; of the War Department's system of procurement as it existed at the outbreak of the World War; of the faults and defects of this system and its evolution into the system which gave better control and supervision of procurement activities and the good accomplished by the latter scheme; of the need for the creation of War Industries Board and something of its activities and the important work done by it; etc. Problem No. 1 should, in my opinion, require the above to be explained in detail as much as possible, and it is believed that at least two weeks or more should be given to the student in solving the problem.

Problem No. 2, the writer thinks, might well be devoted to the object as given in the old Problem 2, viz: "To give the student a general idea of the present organization and plans for procurement in war." However, in the solution of the problem it is believed the student should discuss the functions of the General Staff in regard to supplies; the functions and duties of the

Assistant Secretary of War and the organization adopted by him to carry out these, etc., and the plans and organization of his own particular branch".

----- Maj. C. Newton,
Fin. Dept.

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"Planning in Industry:

More time should be devoted to this subject. Special emphasis should be laid upon the importance of planning rather than upon any specific plan. If possible some relation should be found showing the percentage of personnel working on plans in terms of the total personnel. This involves a time and motion study of different personalities and is very difficult but a rough figure can be arrived at. The course is too short to include a full course in Scientific Management of Business Methods, but there is plenty of time for lots of reading on the subject."

"Problem No. 2 was made easy this year by the War Game played on Sept. 12th. This gave a very good idea of the duties of the Office of the Assistant Secretary of War. The second part of the problem was more difficult and my own solution of it was valueless. I believe that this was due to my ignorance of the entire problem of procurement and I feel that future students will be in more or less the same position. I think that this part of the problem should be covered by monographs or lectures prepared by each branch and distributed to the students. These could then be made the basis for a conference or quiz where all questions could be settled.

These two problems are very important in getting the student started right. (Problems 1 and 2). In my mind it is not a question of getting any original ideas, but of getting the right idea into the mind of the student. It might be a good idea to make up an idealistic organization for procurement, study it, and then have each student compare the organization of his branch with the model."

----- Capt. T.J. Hanley,
A.S.

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"However, it appears to the writer that the first few problems, being in a general sense very closely related, it might be advisable to give these first four problems

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to the students at the same time. It is believed that if this is done, it will save future students considerable confusion and duplication in working up the respective problems."

"With the opening of the course, say the first week or two, it is believed that if one or two lectures on Orientation of the course in general and an illustrative problem or two would do much to help students to better understand the course and what they might expect."

----- Capt. W.S. Elliott,
Q.M.C.

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"The second, third and fourth problems seem to overlap each other to a large extent. It is suggested that these problems be given out together to enable the student to avoid repetition."

----- Capt. V. Wilson,
Ord. Dept.

FACULTY COMMENT:

It is planned to furnish each student officer with faculty comment and criticism of each problem turned in by him during the third course in lieu of attempting to write standard solutions.

Lectures will be given by the officers of the Planning Branch covering the duties of their respective assignment. The general matter of the organization of the office of the Assistant Secretary of War has already been covered by Lt. Col. J.D. Fife, M.C., Chief, Planning Section.

The first four problems given in the Second Course have been combined into two for the Third. The total time to cover this ground remains the same as before.

PROBLEMS - GENERAL.

"I also think that thirty minutes or more could well be spent if an instructor would go over the problems at the time they are issued for solution and before the student commences work on it."

----- Lt.Col. R. Davis,
S.C.

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"That problems and solutions of problems be not used as a basis of checking on the branches.

That the wording of the problems be made more definite as to what is wanted.

That problems be handed out on Fridays under the proviso that all work on the current problem stop Thursday. This will give one day for typing by the branch typists."

----- Maj. J.W. Lyon,
C.W.S.

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"That after the first few problems which, of course, must be general ones in nature in order to properly orient students, all later problems be devoted to specific subjects - that is, to require students to solve particular problems."

----- Maj. C. Newton,
Fin. Dept.

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"Where committee work is required, it is believed that the number of each committee should not exceed five on the average. A greater number makes the committee unwieldy."

"It is believed that one requirement on all problems involving resource studies should call for a war plan based upon available information and that our requirements in all functional studies should call for an enunciation of general principles deduced from World War experience."

----- Maj. R.R. Nix,
Ord. Dept.

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FACULTY COMMENT:

New problems are now being issued prior to the conference on the preceding problem. Opportunity will be given at these conferences for the student officers to clear up points concerning the new problems.

Problems should not be used for checking up on the branches.

Committees will be limited to four or five men during the Third Course.

SOLUTIONS TO PROBLEMS.

"It is believed that it would be of advantage to the students if an illustrative problem were presented to the class as a whole, some time before they were required to attempt a solution, and that a satisfactory solution should be presented to the class after a problem is solved."

----- Lt. Col. W.G. Ball,
Q.M.C.

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"It is strongly recommended that solutions of problems be reviewed by the Staff in conference, and the class be informed of errors made."

----- Maj. W.A. Borden,
Ord. Dept.

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"It is believed that some sort of criticism should be made by the instructors upon each report submitted. This is not for the purpose of goading officers to work as they do at Leavenworth for the purpose of obtaining grades, but for the purpose of pointing out where the student or committee has failed to touch upon the important points or has actually drawn a wrong conclusion from data submitted."

----- Maj. E.E. Kelton,
C.E.

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"I believe that an approved solution should be made of each problem. If this cannot be done, those parts of a problem which are wrong or impracticable can be pointed out and corrected.

Problem No. 1 was excellent in the references given and in the results obtained, but the differences of opinion among the different members of the class were never reconciled. I believe that this problem is one in which an approved solution can be given out and explained at the first weekly conference. I also believe that in addition to the chart, a report should be called for showing the duties of the different divisions of the War Department."

----- Capt. T.H. Hanley,
A.S.

FACULTY COMMENT:

Faculty comment and criticism will be made on each problem submitted and a typewritten copy given to student officers concerned.

PROBLEMS PREPARED FOR FUTURE COURSES.

"Problems: In addition to a minimum number of problems, theoretical and purely instructive in nature, it is thought others based upon actual needs and conditions in the branches and worked out in close liaison with the respective procurement officers therein might be given study by the branch representatives taking the course. The problems so solved to be referred to the proper Chief of Branch for consideration in connection with the program of the branch. In such action will be found increased enthusiasm and practical training for the student and perhaps valuable work in the furtherance of the task in the branches."

----- Maj. L.L. Hopwood,
M.C.

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"A problem which I believe to be of considerable importance and which I offer as a proposed problem for a future course is "The Determination of the most economical reserve of a specific item to be developed and maintained at Government Expense by the War Department as a part of the War Reserve." I believe such a determination in regard to 75 mm H.E. Shell would be of decided benefit to the Ordnance Department. If such a problem is included in the course, it might be well to include it in connection with the problems covered above."

----- Maj. W.A. Borden,
Ord. Dept.

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"A problem on a "Catalog of Equipment" should be included, such as is being worked up by the Air Service. A study of such a sort, together with a requirement involving a list of items or group of items for which a specific procurement plan is necessary, should do much to clarify the idea of what a group procurement plan might be and would also give the student a birdseye view of the entire procurement problem of the branch in place of warped view based on the detailed study of one item for which there may not be any need whatsoever of a procurement plan."

----- Capt. V. Wilson,
Ord. Dept.

FACULTY COMMENT:

The suggested new problems may be given after the length of the course is increased. They can hardly be included at the present time without the omission of other problems considered of greater importance.

WAR GAME.

"The War Game held on Defense Day did more in the way of instruction than any other thing in the first weeks of the course. Through it vivid appreciation of the organization and functioning of the office of the Assistant Secretary of War was secured. I recommend that a game lasting a day be held in connection with the problem on the organization of the Assistant Secretary of War's office."

----- Maj. W.A. Borden,
Ord. Dept.

FACULTY COMMENT:

A war game is planned for the last week of the Third Course.

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8. Course for the Third Class: The course tentatively prepared for the Third class is shown by the figure I (next page). In explanation of this chart, it is stated that the vertical divisions represent the 21 weeks of the course. The small rectangular represent committee work. For instance, during the eighth week, six committees of four members each will be working on the subjects of:

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- Funds for Procurement,
- Resources of the Cleveland District,
- Resources of the Cincinnati District,
- Transportation,
- Interbureau Procurement, and
- Procurement Manual (Sub-Committee No. 2).

Each of these committees will continue their work through the ninth week and two of them (Transportation and Interbureau Procurement) through the 10th week. It will be noted that no committee will have less than two weeks in which to make its study and that some of them have as much as four. As far as

practicable, committees will be formed so as to insure the maximum amount of interchange of members during the course.

As a further development of the Procurement Manual Study, which was begun by the last class (Problems 8 and 28), it is planned to divide the present class into six committees, as follows:

Is this Part I?

- Procurement Manual, Main Committee, "Outline of Manual and Definitions".
- Procurement Manual, Sub-Comm. No. 1, "Organization and Duties, Office, AS.W."
- Procurement Manual, Sub-Comm. No. 2, "Administration".
- Procurement Manual, Sub-Comm. No. 3, "Planning for Procurement".
- Procurement Manual, Sub-Comm. No. 4, "Procurement and Procurement Control".
- Procurement Manual, Sub-Comm. No. 5, "Super-Agencies, Storage, Miscellaneous".

The Main Committee will have the duty of outlining the scope of the work of the other committees so that the entire general ground will be covered without overlapping. Each Committee will have at least two weeks during the course in which to write the particular part of the manual assigned to it. This will be presented for discussion at conference so that the committees may have the benefit of criticism from the entire class. All sub-committees will have the 17th week for the purpose of preparing final drafts. These drafts will be turned over to the main committee which will then have three weeks in which to prepare the final draft of the whole manual.

The object finally sought to be secured is a draft for Part I of a Procurement Manual which may be to the Regular Army officers and particularly to reserve officers on procurement duty what the Army Regulations are to the Army as a whole. The part prepared by the student officers will contain only those things common to all the branches and which should be controlled centrally. Those things which are not common to all supply branches, or though common, should be under the control of the branch chiefs, will not appear in this draft.

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CONCLUSION:

It is felt that substantial progress was made during the Second Course in establishing the Industrial College on a firm basis which will be of inestimable advantage in furthering the cause of National Defense. A great advantage will accrue to the College when graduates of the Harvard Graduate School of Business Administration become available to act as instructors. However, it is believed that it can be said that the formative period has been passed.

H. B. FERGUSON,
Colonel, Corps of Engineers,
Director.