

CHAPTER VI. THE LINER ON 7,500,000 SOLDIER HEADS: 1943

With contracts let for a total production of more than 7,000,000 helmet liners in 1944 and delivery of 13,000,000 of the hats scheduled by the end of 1943, the Quartermaster Corps could reasonably assure a liner for every soldier's head, with supplies for replacement, before the second year of procuring the new item was three-quarters over.¹ The life of a helmet liner was hard to calculate. In combat, since it was considered expendable, a soldier might use one liner a day. For ordinary wear only, a liner might easily last six months. Therefore, it was necessary in laying out plans for procurement, to allow for a good margin for supply. Thus the total figure, when Procurement Directives for the 1944 purchases were added, passed the 20,000,000 mark.²

The summer of 1943, which marked the end of the first year of real production of the helmet liner, found processing and procuring alike settled into a comparatively dependable state. Although new problems would always arise in the processing when a manufacturer

¹The Army in 1943 swelled to 7,000,000 troops and beyond. By spring 1944, its peak strength of 7,700,000 officers and enlisted men had been reached. Office of War Information release quoted in Victory Bulletin, V (April 17, 1944), 14.

²In early 1944, another 3,000,000 liners were added to this "order" as "additional awards" supplemental to the contracts awarded in the fall of 1943. See Appendix I.

decided to experiment with ways of reducing production costs or time,³ the methods of handling priorities, shortages and delinquencies had been well established, and suppliers of helmet liner hardware and other component parts were more used to the responsibility they bore toward keeping constant the production of the liner as a whole.

Specifications for the helmet liner, revised as of August 1943, incorporated the various changes that had been made during the previous year. Although the tests demanded were much more detailed, on the whole they were not so far different from the ones put forth originally, with respect to general standards for measuring the hat's acceptance. Improvements in durability and strength had been possible within the specifications, in contrast to specifications written for many other Government-purchased items which permit but little deviation.⁴ Cooperation among the helmet liner contractors was noteworthy. They were sending their hats to competitors for criticism, and on occasion

³The Capac Mfg. Co., for example, decided to eliminate the pie-cut in making ready the duck for molding, using slits instead. As a result, the finished helmet liner went overweight; then the resin content was reduced, which resulted in a weak hat that failed to meet specifications. In another instance the Seaman Paper Company encountered trouble with its duck, bought impregnated from Westinghouse, because the latter company in its own manufacture of liners for several months had been attempting to reduce the resin content. The Seaman Co. had not been notified of the change and, because it followed a different method of preforming and did not use reinforcing strips in the lay-up, the liner became dangerously light and could not stand up under the various tests. Interview with Mr. Linn, Jan. 24, 1944.

⁴Interview with Inspector Linn.

would pass on improvements to the other firms.⁵ The proportion of rejects in liner production by the end of 1943 was averaging $1\frac{1}{2}$ percent, compared to the approximately 30 percent common in the early days.⁶

Number of Contractors Reduced---Six of the 10 helmet liner manufacturers who had produced the item in 1943 were granted contracts under the procurement directives for 1944 production issued by the Office of The Quartermaster General in August 1943. There were specific reasons why the other four contractors were not asked to continue production. The Hood Company and the St. Clair Manufacturing Company were using the low-pressure molding process, which the Quartermaster Corps had decided did not produce a satisfactory liner; the McCord Radiator Company, which sub-contracted to Hawley Products, had merely been assemblers of the fiber liner, procurement of which was discontinued as soon as the plastic liners were available in sufficient number; and the Inland Division of General Motors was located in Dayton, Ohio, a critical labor area, which made it impossible to assign a new contract unless special privilege was secured from the War Manpower Commission. The Chicago Quartermaster Depot had had enough experience with the six manufacturers chosen to feel reasonable assurance that they could produce the quota needed according to schedule; so, in spite of the fact that both the Hood Company and Hawley Products offered to install high-pressure molding machinery, they were not given consideration. Doubtless there was feeling that

⁵Example: The Seaman Paper Co. found an economical way of laying out the impregnated duck for die-stamping the segments and crown patches, and lent an employee on this operation to the Westinghouse company, which desired to install the method and equipment. Interview with manager of Seaman Paper Co., Jan. 24, 1944.

⁶Estimate by Mr. Linn. These are rejects by the Government inspectors, not the contractors' inspectors.

the smaller the number of producers, the closer the control, and the less difficulty there would be in satisfactorily terminating contracts when the time for the demobilization of war industry came.

No one of the firms which previously had held contracts was surprised by its elimination from the production picture except the Inland Manufacturing Division of General Motors. Despite its being located in a No. 1 labor area, this company, having gained from the War Manpower Commission recommendation for exception, was disappointed at not being given another contract. Workers in the plant, as well as the management, were apparently somewhat at a loss to understand the Depot decision. However, a letter from Major General Gregory, assuring them that they had done "a satisfactory job," dispelled the feeling of doubt,⁷ and the Chicago Quartermaster Depot attempted to assist in disposing of excess supplies by offering to distribute the list of left-over component parts to other helmet liner manufacturers.⁸

Cost of Liner Lessened---The cost of the helmet liner to the Government was considerably reduced by the time the contracts for 1944 production were let, in the late summer of 1943. The first liners of plastic, contracted for in January, February and March, 1942, had averaged approximately \$1.89 apiece, assembled, exclusive of headband

⁷General Gregory's letter itself was not found in the HHS files, but the reply, by J. D. O'Brien, General Manager, read as follows: "... It gives us all great pleasure to know that we have done a satisfactory job and that the Quartermaster General has taken his valuable time to write us....Our people were quite stunned and suspicious when we lost the helmet job but I feel that it was not our fault or theirs that the job was taken from us and if it contributes to a more efficient war effort, we are glad...."

⁸Major Pratt to M. A. Lousa, War Projects Coordinator, Inland Mfg. Co., Feb. 15, 1943.

and neckband. This was in the period when manufacturers were amortizing their equipment costs. Contracts made from April through December 1942, showed unit prices ranging from \$1.66 to \$1.35, with the average about \$1.50. Contracts consummated in 1943, up to the assignments made from the procurement directive for 1944 production, showed a top unit price of \$1.47, a low of \$1.25, and an average of \$1.39. The average unit price paid, considering the total of 16,020,284 liners procured up to the time 1944 production was contracted for, was approximately \$1.54.⁹ The helmet liner contractors to whom contracts for 1944 production were given in August and September, 1943, were paid unit prices ranging from \$1.35 to \$1.45, the margin of difference being much more slight. On the 3,000,000 additional liners contracted for in February 1944, the unit prices were again slightly lower, ranging between \$1.34 and \$1.43. In these last contracts each of the contractors promised reductions in price on deliveries after April 1, 1944,¹⁰ and indications were that future quotations of bids might be still lower because of manufacturers' hoping thus to avoid refunds through statutory

⁹Appendix I, showing all contracts up to March 31, 1944, also shows unit prices. All of these unit prices are exclusive of headbands and neckbands which in the case of each liner assembly bring the total cost up approximately 28 cents.

¹⁰The contracts carried statements that after a specified proportion of it had been manufactured and delivered, the contractor would submit statements on the cost of completed production, and estimates of the cost of producing the remainder of the contract, together with proposed revised prices where justified. An agreement then was to be made between the contractor and the contracting officer as to the price for the remainder of the contract.

renegotiation of their contracts. 11

11 Protective statutes against excessive profits on war goods manufactured for World War II have gone through three phases: (1) Pursuant to the Second War Powers Act, approved March 27, 1942, the President, by Executive Order 9127, issued April 10, 1942, designated the War Production Board, the War Department, the Navy Department, the Treasury, Reconstruction Finance Corporation and the Maritime Commission as the Governmental agencies authorized to inspect the plants and audit records of any contractor or sub-contractor with whom a defense contract had been made, to prevent the accumulation of unreasonable profits. Under this authority, the War and Navy Departments and the Maritime Commission directed the establishing of price adjustment boards to assist in securing voluntary adjustments or refunds whenever prices, costs or profits were deemed excessive. (2) Enactment of Section 403 of the Sixth Supplemental National Defense Appropriation Act of 1942 applied renegotiation to all contracts and subcontracts with specified exceptions and made contractors liable, until three years after the war, to refund such part of their profits as were found unreasonable. This act, substance of which was suggested by the procuring agencies to Congress, required contractors to furnish adequate data on actual costs and profits after experience in production and, upon request by the head of each Department buying war materials, to bargain in good faith in the light of such data for adjusting the contract price. Because prices of all contracts and subcontracts could not be examined and renegotiated individually, over-all renegotiation was adopted, which permitted examination of contractor's profits on his entire war business for a specific fiscal period. All contractors who did \$100,000 or more worth of business during one year were subject. (3) During 1943 the renegotiation law and its administration were closely examined; revisions resulting were incorporated in the Revenue Act of 1943, passed over the President's veto and becoming law Feb. 25, 1944, to apply to fiscal years ending after June 30, 1943. Main changes made were: lodging of the renegotiation power in an inter-departmental War Contracts Price Adjustment Board instead of in the Secretaries of the Departments; definition of the Tax Court of the United States as the agency for redetermining excessive profits; vesting repricing in Departmental Secretaries; raising the exemption measured by sales volume from \$100,000 to \$500,000; and termination of renegotiation at the close of 1944 or six months earlier or later by Presidential proclamation. The 1943 Revenue Act contained a specific provision authorizing the War Contracts Board and the contractor to enter into agreements for eliminating excessive profits likely to be realized in the future by adjusting prices for remaining deliveries under existing contracts on an over-all basis by a voluntary agreement. Renegotiations are handled on a joint basis, the Department or Service with the predominant interest being assigned the proceeding; within a Service, the power of renegotiation may be delegated down to lower authority, as in the case of the helmet liners within the Quartermaster Corps. "Renegotiation Regulations for Fiscal Years Ending after June 30, 1943," Introduction.

A number of the contractors had had experience with re-negotiation, on either a voluntary or a statutory basis, frequently with resultant "refunds" to the procurement agency, and the final average cost of the helmet liners procured even under contracts made through February 1944 actually was somewhat less than the amounts written in the contracts would show.¹² Companies which voluntarily reduced the unit price of the liners from the amount agreed upon in their contracts were Westinghouse, Firestone and International Molded Plastics. The total saving to the Government from these voluntary reductions on 11 contracts amounted to more than \$970,000. The Westinghouse company¹³ made such reductions beginning with its first contract of 1942, offering change prices of 19 to 21 cents per liner on eight contracts for a total adjustment of \$895,732.95. Thus liners which had been contracted for with this firm at \$1.43 and \$1.45 apiece, eventually cost the Government only \$1.24 and \$1.26. The voluntary reduction made by the Firestone company on one contract of 1,188,000 liners was four cents a liner, and totaled \$47,520, while International Molded Plastics, turning back 10 cents a unit of 297,000 liners, saved the Government \$29,700.

¹² Average cost considering these adjustments cannot be determined accurately; although the change prices under voluntary agreements were exact, the statutory renegotiations on which files were available in most cases involved more services than the Q.M.C., so that the total refund would have to be allocated in arriving at a per unit reduction figure; and such an allocation would be impossible because the proportionate interest of the Q.M.C. was declared "indeterminate."

¹³ The Westinghouse company produced its own phenolic resin for impregnating the duck, and apparently had the edge on the other helmet liner contractors, who had to pay a higher price for the material because phenolic resin manufacturers had succeeded in keeping the price universally high. Interview with Major Pratt.

Helmet liner contracts assigned for statutory renegotiation to the Chicago Quartermaster Price Adjustment District Office for the fiscal years 1942 and 1943 were those with the St. Clair Rubber Company, the Capac Manufacturing Company and the International Moulded Plastics Company.¹⁴ Although the renegotiations with these three firms are not necessarily representative of the entire group of liner contractors, they afford a sampling, and are discussed here for that reason.¹⁵

Renegotiation of the St. Clair contracts of 1942, handled by the New York Quartermaster Price Adjustment District Office before it was turned over to the Chicago office, resulted in the eventual refund to the Government of \$36,000, less income tax credit. The sum represented the excess profits on two helmet liner contracts completed

¹⁴As indicated in footnote 11, p. 109, the Department or Service with the largest proportionate interest in a firm's war contracts carried on renegotiation proceedings for all departments or services concerned. Thus the Navy Department was assigned helmet liner contracts of the QMC with Mine Safety Appliances, and the Westinghouse Electric and Manufacturing Company; the Hood Rubber Company's contracts were renegotiated by the Army Price Adjustment Board in 1942 and by the Army Air Forces in 1943; this was also true of the Firestone Tire and Rubber Company; the McCord Radiator and Manufacturing Company renegotiation was handled by the Ordnance Department; and the Seaman Paper Company was reassigned from the QMC to the AAF. No record of assignment appeared with the War Department for the Inland Manufacturing Division of General Motors, though it is possible that General Motors' war contracts as a whole included those of the Inland Division.

¹⁵Inaccessibility of information on the other firms made it impractical to attempt to secure the history of their renegotiations.

in the fiscal year ended June 30, 1942, and was returned in December, 1943.¹⁶ In effect it was a 13.5 percent price reduction on the original contracted price of the liner. In 1943, helmet liner sales of this company showed profits of only $4\frac{1}{2}$ percent, as against 22.8 percent per unit and 16.4 percent on the preceding two contracts; therefore no refund was sought for the Government on operations of that year, which saw termination of business with the company.¹⁷

The Capac company's contracts for 1942, also renegotiated by the New York Quartermaster Price Adjustment Office, showed adjusted profit on the helmet liner sales of little more than \$100, and the company was "cleared" for the fiscal year ended December 31 of that year. Renegotiation for the 1943 fiscal year, assigned to the Chicago price adjustment office, was not completed at this writing.¹⁸ The renegotiation history of International Molded Plastics was similar. Total volume of Government business in its 1942 fiscal year amounted to less than \$100,000, which automatically released the company from renegotiation for that year, and the 1943 record had not yet been examined.

¹⁶ Renegotiation proceedings in all cases had to be started within one year after the close of the fiscal year in which the contract was completed, and finished within one year of starting the proceedings. At date of this writing final information on renegotiation of 1943 contracts is not available in most cases.

¹⁷ Information in entire paragraph from QM Price Adjustment District Office, Chicago.

¹⁸ Capac file, in QM Price Adjustment District Office, Chicago.

Part of the reduction in the manufacturing cost of the liner, as time went on, was due to making more efficient and less costly the production of the helmet shell and assembly, and part to the cost reductions effected by suppliers of the suspension, neckstrap and chinstrap which were included in the "assembly" at the prime contractor's plant. Although few figures were available to the writer to show comparative costs of components of the helmet liner such as hardware and suspension, price quotations of 1942 and 1943 from the Scholl Manufacturing Company on items it manufactured indicate the paring down of costs that became possible. Whereas in April 1942, when the new suspension for the adjustable headband and the improved chin strap had just been adopted, a price of 26 cents was bid for the top suspension and the neck suspension or neckstrap together, in December 1943 the price for the same two items was 12.4 cents.¹⁹ On chin straps the price quoted in April 1942 was 16 cents; in December 1943 the bid was 8 3/4 cents.²⁰ Johnson & Johnson, another supplier of the suspension, quoted a price of approximately 13 cents for the item in mid-1942, after adoption of the leather and webbing combination, and offered to supply neckstraps at 4 cents each.²¹

A progressive decline is traceable also in the cost of headbands and neckbands, which continued to be procured directly by the

¹⁹ Interview with G. C. Skinner, Director of War Contracts and Priorities, Scholl Mfg. Co., Chicago, Dec. 16, 1943. In the earliest days of liner procurement, the Scholl company had made a contract with the Philadelphia Quartermaster Depot for the "headband assembly" at a unit price of 38 cents. The "headband assembly" apparently was the top suspension which in April was quoted at 26 cents.

²⁰ Ibid.

²¹ Profit on the suspension was about six cents, and on the neckstrap a trifle more than one cent, according to letter of J. Nelson Stuart, Johnson & Johnson, to Major Pratt, CQMD, Oct. 8, 1942.

Chicago Quartermaster Depot mainly from the firms producing them during the first year the liner was manufactured. The headband of the "snap on" type furnished with the liners before the adjustable headband was adopted was a less expensive item than the adjustable band because of its simplicity. Contract prices on the snap-on band were made apparently at only two figures: \$0.15214 and \$0.16.²² Prices on the more complicated adjustable headbands throughout 1942 ranged from \$0.28 to \$0.385 with an average of approximately \$0.32. In 1943 contracts on headbands showed unit prices averaging \$0.26, with extremes of \$0.214 and \$0.35 in the case of single contractors. The 14,000,000 headbands contracted in November 1943 for 1944 production were bought from 27 firms whose unit prices ranged from \$0.245 to a top of \$0.2725, the majority at \$0.26 and \$0.27. The price of \$0.26, taken as average at this writing, thus is a reduction of \$0.06 from the average paid the first year the adjustable headband was purchased.²³

Neckband manufacturers, who were in most cases the same firms as those fabricating the headbands, gained contracts in 1942 at prices ranging from \$0.0175 to \$0.0275 and in 1943 from \$0.017 to \$0.02. Commitments for 1944, which were made in October 1943, show only one contract

²² Appendix I.

²³ There were also some renegotiations of contracts with headband-neckband-chin strap manufacturers, with resultant refunds to the War Department which would reduce the actual expenditure for these items. On 1942 contracts, for example, the Scholl company refunded a total of \$145,000 as excessive profits on its Government contracts in the taxable and fiscal year ended Dec. 31, 1942; and the Sun Shoe Company was asked to return \$43,000. Chicago QM Price Adjustment District Office files.

for a 2-cent neckband, the nine others ranging from \$0.017 to \$0.01835.²⁴

Chin strap replacements bought for the liner by the Chicago Quartermaster Depot totaled 2,588,765 up to this writing,²⁵ contracts being awarded at unit prices of \$0.07 to \$0.91. Except for one contract let in September 1942, all chin strap contracts made to date were consummated in April and May 1943, so no chronological cost comparison is possible.

The prices on the helmet liner and detachable parts throughout their procurement history reflect the fact that the article was in a developmental stage while in manufacture. It was hardly possible, for instance, for the contracting depot or any other authority to know what exactly would be a fair price for the first manufacture of the liners under the first contracts of February and March, 1942, because of the newness of the item. Then, when the second group of contracts was let--those from April to December, 1942--changes in design, including the new adjustable headband, made it difficult to compare costs. With the filling of the second group of contracts, however, manufacturers' cost figures, beginning to show some stability, could be utilized to advantage by the Depot contracting officer in determining at least what the maximum price should be.

Unit Cost Comparisons--While the first of the plastic helmet liner contracts were filled at unit prices more or less arbitrarily set by the contracting firms, as soon as manufacturers' cost figures became available, they were sought by the Depot contracting officer as aid in

²⁴Ibid.

²⁵Replacements of chin straps were infrequent on the liner in use, since except in windy climates, the chin straps usually were pushed up on the liner brim.

deciding upon fair prices for the next procurement. The first of these manufacturers' cost figures were submitted in accordance with War Department regulations in the fall of 1943, and were used in arriving at price acceptances in the procurements made in September of that year for 1944 production. Study of unit cost breakdowns by the Depot cost analyst was to come about some time later, when the Office of The Quartermaster General issued an order to the effect that all clothing and equipage items on contracts for more than \$100,000 be subjected to price analysis.²⁶

The first unit cost breakdowns were reported, on the approved War Department form, in such a way as to be not particularly valuable except for inter-company comparisons, since in the case of the helmet liner many factors useful in analyzing reasons behind costs could be hidden in such terms as "direct material" and "purchased parts." A comparison of information offered by one company on the cost breakdown of proposed contract unit price and the cost per unit under previous contract indicates, however, where possibilities of savings lay under the broad terms:

²⁶QMG Letter SPQBM 323.3: Establishment of a contract price analysis section in the Procurement Division, Sept. 15, 1943, specified this course, in accordance with an QMG Office Order No. 25-44 of July 31, 1943.

Cost Figures of Seaman Paper Company

<u>Factors</u>	<u>Estimated Amt. Per Unit, Proposed Cont. (470,000)</u>	<u>Cost Per Unit, Previous Cont. (210,000)</u>
Direct Material	\$.819	\$.794
Less scrap or salvage	.023	.021
Net direct material	<u>.796</u>	<u>.773</u>
Purchased parts	.114	.121
Direct productive labor	.120	.104
Misc. direct factory charges	---	---
Indirect factory expenses	.180	.156
Engineering and dev. expenses	.030	.030
General and admin. expenses	.045	.045
Selling expenses	.000	.000
Contingencies	---	---
Other expenses	---	---
Total Cost	\$1.285	\$1.229
Operating Profit (bef. inc. and excess prof. taxes)	<u>.115</u>	<u>.121</u>
Total Unit Price	\$1.40	\$1.35

The percentage of profit in the case of this company was 9.3 percent on the previous contract and 9.0 percent on the proposed one. The cost summary of this same company offered in September 1943 for a share of business in the 1944 procurement directives showed that the estimated figures on the previously gained contract²⁷ were slightly higher than costs actually turned out to be, and that a profit of 9.3 percent had been realized. The summary of actual costs, presented in somewhat different fashion on a form originated by the Depot, was as follows:

²⁷Col. 1, above.

Seaman Paper Company

<u>Factors</u>	<u>Cost Per Unit</u>	<u>Percent</u>
Direct material	\$.780	55.7
Sub-contracts	.130	9.3
Direct labor	.110	7.9
Manufacturing expense (burden)	.175	12.5
Total manufacturing cost	<u>1.195</u>	<u>85.4</u>
Administrative and general expense	.075	5.3
Other cost	.000	.0
Total cost	<u>1.275</u>	<u>90.7</u>
Profit	.130	9.3
	<u>\$1.40</u>	<u>100.0</u>

The Seaman company's direct material costs breakdown on this summary showed that of the 78 cents, \$0.495 went for the phenol impregnated fabric, \$0.135 for the suspension assembly, \$0.082 for the chin strap, \$0.035 for rivets, washers and other hardware, and \$0.033 for paint and packing materials. This company,²⁸ with its compact and carefully managed plant which had comparatively small overhead, was typical of the smaller plants manufacturing the helmet liner with respect to cost factors.

A comparison of cost figures from two of the larger plants²⁹--- the Firestone Tire & Rubber Company and the Westinghouse Electric & Manufacturing Company---is interesting, especially in view of the fact that the former apparently made its estimates very close while the latter preferred to make its price proposal with a contingency allowance which later was voluntarily returned to the Government. In September 1943 these two companies furnished estimated costs per unit for contracts of 1,783,000 and 2,703,951 liners, respectively, as follows:

²⁸Actually the Molded Products Company, at 4533 W. Harrison St., Chicago, was the plant used by the Seaman Paper Company to manufacture the helmet liner.

²⁹Unit cost summaries of the six companies producing the helmet liner contracts of 1942 and early 1943 are given in Appendix IV-A.

Factors	Cost Per Unit		Percent	
	Westinghouse	Firestone	Westinghouse	Firestone
Direct Material	\$0.496	\$0.5515	34.7	40.0
Sub-contracts	0.320	0.2589	22.4	18.8
Direct labor	.102	.1123	7.1	3.2
Manufacturing expense	.200	.2729	14.0	19.7
Total manufacturing cost	<u>\$1.118</u>	<u>\$1.1956</u>	78.2	86.7
Admin. & Gen. expense	.066	.0622	4.5	4.5
Other cost	.056	-----	3.9	---
Total costs	<u>\$1.239</u>	<u>\$1.2578</u>	86.9	91.2
Profit before taxes	.191	.1222	9.9	8.8
Selling Price	\$1.43	\$1.38	100.0	100.0

Breakdown of supplementary cost details for these two companies, as reported on a second type of form sent out by the Depot,³⁰ showed that Westinghouse, with its own resin for impregnating duck, reported a cost of \$0.461 per unit on this item, while the Firestone company was paying \$0.5154 per unit for it. The Westinghouse company, on the other hand, showed a respective unit cost of \$0.11 and \$0.18 for the chin strap and the suspension and neckstrap, while the Firestone company secured these items for \$0.0860 and \$0.1432, respectively. Miscellaneous hardware cost the former firm \$0.0304 and the latter \$0.0297.

Services of the Depot cost analyst were utilized for a surface check of the helmet liner cost summaries when the large procurements of autumn 1943 were made and for headband costs at that same time; but up to this writing there had been no opportunity for the cost analysis office to look into details of helmet liner plant operations by field visits.

³⁰ Table in Appendix IV-B shows comparative cost figures in two periods.

and to examine thoroughly any elements of cost seemingly out of line for the individual company or not typical of the industry. It was anticipated, however, that as time and expansion of the cost analysis staff permitted, cost figures on the liners would be subjected to more exhaustive study before the issuance of further contracts.

The M-1 helmet assembly, steel hat and liner, with its double use and superior protection,³¹ now is costing the Army approximately the same amount or slightly less than the "steel pot" known as the M-1917. Whereas the cost of the M-1917 helmet shell averaged \$0.97 and the harness for fastening it \$1.40 to \$1.50,³² the average cost of the M-1 steel shell is \$0.90, and the helmet liner may be considered as costing \$1.50 to \$1.35; with the headband and neckband, averaging \$0.28, the total cost is in the neighborhood of \$2.50.

The Helmet Liner Procurement Today---As the liner for Helmet, M-1, enters its third year of production at the time of this writing, with finished items coming off the assembly lines at the rate of 800,000

³¹The American combination of steel helmet and helmet liner was the best headgear used by any army in the North African theater. In a test firing a .45 cal. pistol from 10 yards at the British, German, and American helmets, it was found that the American helmet was the most durable....This headgear was worn almost all the time in the combat areas. In rear areas the helmet liner was extremely popular and worn most of the time....The only defect encountered with the helmet liner was the fact that the paint was caking and chipping excessively...." Capt. William F. Pounder, Jr., QMC, "Report of Quartermaster Operations in the North African Theatre, Mar. 5-June 2, 1943."

³²Bid prices given the Bates Shoe Company, Webster, Mass., manufacturers of the liners for the M-1917 steel helmet of World War I. Bates Shoe Company to OCMC, Apr. 7, 1944.

a month, the procurement function proceeds with relatively few important hindrances. This agreeable state has been reached seemingly in part through the delegation of as much authority as possible to the procuring depot. At this point, March 1944, the Chicago Depot, upon receiving the procurement directives for liners from the Office of The Quartermaster General, takes complete charge of selecting contractors, notifying them as to production schedules which have been arranged in accordance with master production plans of Washington, and keeping constant watch on the production rate so as to be able to say within days whether the distribution orders can be fulfilled according to the scheduling or whether delinquency is occurring. If delinquencies and delays occur, the Depot, being immediately informed by the plants or by inspectors stationed there, determines the causative factors and puts into operation the means for correcting them. If troubles are mechanical, the chief inspector makes a factory visit to offer aid; if they involve material shortage, the Depot's priorities branch or proper departments in the Office of The Quartermaster General are called upon to help straighten out the difficulty. When specifications are changed by the Military Planning Division of the Office of The Quartermaster General, the Depot is notified and is given sole responsibility for informing contractors about the changes, and for granting permission to delay the changes where expedient.

This picture of liner procurement is in appreciable contrast with that presented in the early days, when Depot procurement authorities

in carrying out their duties, were hard pressed to keep pace of changing design and specifications and technological difficulties, while trying to meet a rapidly snowballing demand. The first two years of procurement have offered experience in almost every kind of difficulty that could be anticipated in producing the liner, and the ways of solving the difficulties have been discovered. From this point on, it is doubtful whether any new kinds of trouble will appear, and the pattern of procurement therefore can be expected to remain more or less static. With production now projected to a total of 10,000,000 liners for delivery during 1944, the problem of meeting current demands with adequate supply should be well taken care of.³³ Future predictions of demands and the procurement directives ordering their fulfillment will as in the past be forthcoming from the planners of procurement in the Office of The Quartermaster General, working with the Army Supply Program.

When the war enters its closing stages there will be another problem to consider---the demobilization of the industry which produces the helmet liners. However, because of the fact that the helmet liner manufacturer might easily convert to production of such items as industrial safety helmets, hunters' hats and crash helmets, and because only six firms are engaged in production, no great problem of readjustment is anticipated.³⁴ Toward the accomplishment of demobilization planning for the helmet liner no effort has yet been made, although the

³³Interview with Major Pratt.

³⁴Ibid.

Chicago Quartermaster Depot, like other large procuring depots, has established a Demobilization Planning Unit as a staff unit.³⁵

Through this unit contract terminations and disposal of material will be handled, dependent upon larger plans made by Washington, but it is impossible at this writing to supply any information especially applicable to the helmet liner.

³⁵ CQMD Gen. Order No. 5: Establishment of Demobilization Planning Unit, Mar. 4, 1944.