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THE PROCUREMENT OF ARMY ORDNANCE  
21 February 1946.

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THE PROCUREMENT OF ARMY ORDNANCE  
21 February 1946.

GENERAL ARMSTRONG:

General Hughes, General Quinton and gentlemen: The recently appointed Chief of Ordnance, Major General Everett S. Hughes, is not going to lecture this morning on the procurement of ordnance materiel. That lecture will be given by General Quinton, who has had the closest contact with Ordnance procurement during the war, first in the office of the Chief of Ordnance in charge of the work of all the districts, and then in the field in the Detroit District, where he ran the operations there for several years. General Quinton is now the Commanding General of Aberdeen Proving Ground. Before General Quinton speaks, General Hughes, the new Chief of Ordnance, has been good enough to come here to say a few words to this class.

General Hughes was at the other end of the line of communications. General Hughes was deputy theater commander in North Africa, and later he covered the entire waterfront for General Eisenhower in going from one point that needed investigation to another.

Gentlemen, it is a pleasure to present to you the new Chief of Ordnance, Major General Everett Hughes.

GENERAL HUGHES:

Gentlemen, the last time I was in the Army Industrial College it was located in the old Munitions Building.

Another argument developed between General Quinton and me a few minutes ago. I said that I thought one of the principal benefits to be derived from the Army Industrial College was the ability to talk a common language. I still think I am right. When I see Navy, Marine Corps, and Army men here, all of whom are discussing common problems, I am sure that the observations that I made overseas are true--that there should be a school established for the purpose of teaching a common language. I think it will be a great benefit to any future course of officers if everybody does talk a common language.

During the war it was perfectly evident that division commanders, corps commanders, and army commanders were able to move from one part of the front to another part of the front, join a new corps, join a new army, or fight alongside another division, and find out at once what the plan of the higher commander was or what the adjoining commander was doing, simply because they all used the same terminology. There were no errors as a result of one man saying one thing and having it understood by another man to mean something else. It made for unity of command; it made for speed; and it made for ultimate success.

I have seen a lot of procurement men or men associated with procurement during the war. To me it was remarkable that army officers could fit in with men from industry, could fit in with naval men, and could fit

in with the British and the French on procurement problems and understand one another and know what each was trying to do.

General Quinton took the point of view that this College is established primarily for the purpose of free discussion. Thank God we have some place in the Army where we can get together and express our own views without being subjected to pressure from clearing devices or other things. I think it is grand. All I am saying is, what is the ultimate result after all the free discussion? I still come back to this--that it enables men to know one another. It enables men to understand one another, which, after all, is the principal thing.

Most of our difficulties during the war with our allies was the fact that we did not understand them and they did not understand us. After we got to understand one another it turned out that most of us were in common agreement; but it took a long time to find that out, because of language difficulties and terminology.

I have had nothing to do with procurement since the First World War. During the First World War I was Chief of the Artillery Section of the Procurement Division, and I thought I knew something about it. But World War II has been principally a procurement war and a manufacturing war. I think the only thing that saved us was the fact that we had so much materiel and got it out so quickly, inspected it so well, and shipped it so perfectly that we could land it on the beaches and get it broken down and on to cranes and trucks, haul it several hundred miles, and get it into the hands of the troops. It all started with procurement. So if we can devise any more perfection to the present system, I think it will be fine.

I would just like to leave one word of advice with you, and that is that, before we change the system, let us realize that it did work, and it worked in the biggest war to date. There were a lot of people involved in this war; so that generally speaking the plan must have been a very good plan. Thank you.

GENERAL ARMSTRONG:

I forgot to say, gentlemen, that in addition to his other distinguished services, General Quinton was for a long time a member of the Army Industrial College faculty. So to him it is like coming home to address you gentlemen this morning. Gentlemen, General Quinton.

GENERAL QUINTON:

General Armstrong and gentlemen: The subject that I am going to cover today is rather broad; I have not put too much preparation on this and I do not need much preparation to tell my story but, to organize it properly and to save you confusion, I will resort to some reading of my notes.

General Hughes, the Acting Chief of Ordnance, has just addressed you and said that I am going to lecture this morning on the "Procurement of

Army Ordnance." I am quite flattered by this assignment, because, as General Armstrong has said, I was an instructor here for four years. Furthermore, ever since World War One I have known General Armstrong extremely well and have worked for him and with him all these years. The College and the new students are definitely to be commended for having General Armstrong as their Commandant.

In fact, I would say that the time I spent here in this College were four of the happiest and most prosperous years of my army career. I will never forget them. They stood me in good stead for a great many years.

Indeed, the Ordnance Department interest in this College is so deep and has extended over so many years that I would like, as a preface to my remarks today, to recall to you a little history with which you may not be familiar. Some great Ordnance names are connected with the beginnings of the Army Industrial College. There comes to mind the names of Major General C. C. Williams; Major General C. T. Harris, Jr.; Major General James H. Burns; and Brigadier General R. H. Somers. General Burns, I am told, was the instigator of the idea that lead to the establishment of this College. He presented his views to General Williams, who was then Chief of Ordnance, in a memorandum dated 7 August 1923. On the seventeenth of that month, General Williams appointed a board of ordnance officers, consisting of General Burns, General Harris, and General Somers, to study the problem of an industrial college for military personnel. On the same day, General Williams conferred with the late Dwight Davis, then Secretary of War. All agreed that it was necessary to establish some system of instruction for our industrial war planners that would do for them what was being done for the instruction of officers regarding war plans for the mobilization of manpower. From these beginnings the College took formal shape. On 25 February 1924, its establishment was announced by Mr. Davis.

I mention this fact because the officers involved were the originators of an industrial-military policy which became accepted army and naval doctrine. In the prosecution of World War II that doctrine was the salvation of our Armed Forces and those of the United Nations. Had it not been for the Williams philosophy as carried forward by the Ordnance Department for more than 20 years, even this College might not have attained the eminence it won in the field of industrial mobilization. These references are not made to bring undue glory to any individual, much less to the Ordnance Department. But the Industrial College did not just happen. Much went on prior to that date when Mr. Davis made his announcement, and a great deal of what went on was due to Ordnance initiative and sound thinking. All told, this College has produced the highest results in our military and industrial potential.

Naturally, then, I am pleased to narrate to you something of the Ordnance method and procedure in World War II from the industrial mobilization point of view. What was done in war was the continuation of the very philosophy which brought about the Army Industrial College. Simply stated, that philosophy placed the burden of Ordnance production where it rightfully belongs, namely, upon American industry itself. In the Williams'

school of thought, simplicity, mutual confidence, and objective thinking were the guideposts. Under such a philosophy it was heresy to design and produce special Ordnance equipment when industry itself had something to offer in normal everyday usage that would fill the bill. Similarly, Ordnance in peace and war strove not to duplicate effort, not to become engrossed in complicated procedures, yet at the same time to assure the best of equipment in adequate quantity and always to safeguard the public interest.

During World War II the Ordnance Department of the Army, in cooperation with American industry, produced more than 9 billion dollars worth of ammunition, more than 3 billion dollars worth of small arms, more than 5 billion dollars worth of artillery, and more than 19 billion dollars worth of tank and various types of combat and noncombat military vehicles. The total dollar volume was in excess of 38 billion dollars.

Here are a few typical items. The Industry-Ordnance team produced nearly 11 million tons of artillery ammunition, about 6 million tons of bombs and rockets, more than 15 million rifles, carbines, pistols, revolvers and Browning automatic rifles, more than 22 million helmets, more than 180,000 pieces of aircraft artillery, more than 270,000 tanks and self-propelled weapons, more than 2 million trucks, and more than 1 million other vehicles.

In discussing some of the procurement phases of this gigantic wartime Ordnance program, I should like first to mention the fact that Lieutenant General L. H. Campbell, Jr., Chief of Ordnance, is now reading the galley proofs of his forthcoming book, "The Industry-Ordnance Team". This book will give you an excellent over-all picture of Ordnance industrial operations in World War II.

My own part in the war effort was largely in the field of procurement first as Chief of the District Control Division, and later as Chief of the Detroit Ordnance District. The annual procurement of the Detroit District alone was larger than the annual sales volume of U.S. Steel, General Motor and the American Telephone and Telegraph Company combined. In July 1945, the month preceding VJ-day, the dollar value of prime contracts and purchase orders under administration by my office was \$7,289,074,840.44.

The Ordnance Department did not initiate requirements for the 2,000 major pieces of fighting equipment and the 700,000 component parts which Ordnance supplied our combat troops, troops in training, the Marine Corps, the Coast Guard, the Air Forces, and the combat troops of 43 allied nations. Requirements were handed down to us by the War Department General Staff, G-4 and by Army Service Forces. Upon receipt of these orders, Ordnance allocated actual procurement and the administration of procurement contracts to its 13 decentralized procurement districts located in various industrial centers throughout the country, and to our manufacturing arsenals.

The function of the 13 districts, originally established in 1918, was to establish and maintain a close working relationship with private industry and to determine just what potential war production capacity existed

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in case of need. The districts learned about industry in their respective territories and were eventually to receive broad responsibility and authority for all phases of procurement within their boundaries.

Through all the years between the end of the First World War and 1938, civilians and officers in the districts were planning for mobilization day. They did not know when it would come or how it would come. Not even the visioned men who arranged for the passage of the National Defense Act of 1920, under which the Assistant Secretary of War was charged "with the assurance of adequate provision for the mobilization of material and industrial organization essential to wartime needs", could then foresee the events that have taken place within the past few years. All of them, however, remembered the stark unpreparedness, confusion and fumbling of the First World War; and they wanted this Nation to be at all times adequately prepared.

The sovereign American People decided otherwise. During the period of the "long armistice" our Army was allowed to dwindle in size and effectiveness until it numbered only about 174,000 officers and men. The entire strength of the Ordnance Department including officers, enlisted men and civilian workers, was 17,015--about the size of the New York City police force. Interest in national preparedness waned. Many people thought that international conferences would guarantee lasting peace, and this attitude was reflected in small congressional appropriations for our military establishment. The lessons learned in World War I were only inadequately applied. Meanwhile the German General Staff thought so highly of our district system that they proceeded to copy it verbatim!

Under these discouraging circumstances the districts initiated and carried on industrial surveys. A record was made of a company's equipment, the manufacturing processes employed, and the products manufactured. Very frequently a gentleman's agreement was made, known as an accepted schedule of production, which specified the quantities and rates of future war production. The plant was then allocated to Ordnance, upon request, by the Assistant Secretary of War. This eliminated conflicts between the various supply branches of the Army and the Navy. The final step consisted of planning how the company would go about producing unfamiliar ordnance items. This phase of planning included such data as plant layout, machine tool requirements, gages, raw materials, labor and power. In short, complete plans were made for altering existing facilities and adapting them speedily to the production of noncommercial items. These plans were revised from time to time and every effort was made to keep them up-to-date.

The turning point came in 1938, the year before the Germans invaded Poland. The European situation was deteriorating so badly that I was directed to intensify industrial survey activities and to expand district organizations--and funds were made available. In December of that year the Assistant Secretary of War, Mr. Louis Johnson, urged all district chiefs, at a conference in Washington, to bring industrial surveys up-to-date so that "we would be familiar with every potential war-producing facility in your district."

Shortly after this meeting, the Congress authorized the Secretary of War to place educational orders "For munitions of war of special or technical design, or both, noncommercial in character, with commercial concerns to familiarize them with manufacture". When limited funds became available--Ordnance had been advocating educational orders since 1928--contracts were placed with industry either to initiate complete production studies or to begin production on specific Ordnance items. Production equipment, purchased directly by the manufacturer, was paid for out of government funds and it was intended that this equipment should constitute a reserve for allocation in time of emergency. An educational order for the Garand Rifle, for example, was placed with a private concern. When a production order was later placed with this company, the cost of the educational order was saved in the first thirty or forty thousand rifles produced, and the time it took to get into production was reduced by nine to twelve months. A similar instance is cited in the case of time saving effected by the Saginaw Steering Gear Division of the General Motors Corporation in the transition of an educational order to full production of .30 caliber machine guns. However, only a few companies in each district could take advantage of educational orders because appropriations amounted to only a few million dollars.

Before work on educational order contracts had progressed very far, the growing national emergency brought about the appropriation of new funds for a more urgent and extensive procurement program. In the summer of 1940, following the German conquest of the low countries and France, the districts began to receive details of the greatly enlarged program. Educational order contracts were converted into defense contracts and the mobilization of many additional contractors was started. The districts now began to capitalize upon the comprehensive and thorough surveys made in previous years. The exact knowledge existing in the district offices regarding the manufacturing capacity in their areas was of inestimable value in quickly locating likely sources of production. One month after the first large-scale Ordnance appropriation was approved, 70 percent of Ordnance orders had been placed and 95 percent of these orders were placed with allocated facilities. Substantial funds became available on 1 July 1940; and a contract for the first large smokeless powder plant was signed on 17 July 1940; this plant was producing smokeless powder in April 1941. I cite this as an example of the promptness with which this large production activity was inaugurated. We had plans ready and we moved promptly. When even larger appropriations became available, our procurement, construction and production programs were accelerated in step.

One major handicap that we encountered was that mobilization day was never officially declared. This meant, that prior to Pearl Harbor, we were trying to achieve quantity production while still operating under many peacetime procurement restrictions and limitations. At the same time, failure to declare an official M-day made it possible for Ordnance to allocate procurement orders to the districts gradually over a period of time and hence the districts were able to make many necessary adjustments.

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Prior to July 1940, the districts had little direct purchasing authority. During the years of unquiet peace, Ordnance purchasing was done mainly by our six old-line arsenals, with some special types of contracts executed in Washington.

The transition from centralized to decentralized purchasing was not achieved without the usual growing pains that any new large-scale undertaking would be expected to have. One of the first prewar purchase allocations forwarded to the districts, under date of 16 August 1940, was for a large number of artillery ammunition components. As experience was gained and as the procurement load increased, more and more allocations were sent to the districts in order to supplement the purchasing being continued by the arsenals and in Washington. On 14 December 1940, the arsenals were directed to assign the administration of all their contracts to the districts within whose boundaries the materiel was being manufactured. In March 1941, district chiefs were authorized to approve the awards of contracts up to \$500,000 and, still later, authority was delegated to award contracts up to \$5,000,000 without referring to higher authority unless special conditions existed.

Purchasing on a greatly increased load was placed on the districts in June 1941. It was then that the districts first experienced deadline dates on production. Deadlines eventually became so frequent that they were the rule rather than the exception. The districts rose to the occasion of training wholly inexperienced personnel and met the requirement of negotiating for large quantities of materiel. In addition to expediting the purchasing functions, the districts found it necessary in many cases to buy machine tools, perishable tools and other production equipment which particular plants needed to produce large quantities of ordnance combat equipment in a hurry. The lack of manufacturing capacity and the critical nature of the desired item determined the degree to which ordnance aided civilian plants in setting up facilities.

In the early months of the war we concentrated all of our time and energy upon the construction of new government-owned facilities and the expansion of privately owned plants for the production of vast quantities of urgently needed materiel. Production at any price was the watchword of the entire country--and correctly so. During those early hectic months, proper pricing, in any real sense, was an utter impossibility. Neither industry nor Ordnance had the foggiest notion of what prices should have been. Relatively unsettled economic conditions and shortages affected the availability and cost of materials. Wage scales were uncertain. Many Ordnance weapons had never before been manufactured on a mass production basis. Our troops overseas and in training were in desperate need of modern combat equipment. Our Allies were looking to us for immediate assistance. There was no time to sit down and scrutinize prices. The country at large felt that this was a much less important consideration and should be discussed at a later date. Long-term contracts were the order of the day and it is not surprising that contractors, for reasons of self-preservation, required prices at high levels in order to protect themselves against unforeseen contingencies.

Since demand exceeded supply, the normal forces of competition did not operate to control prices and stimulate productive efficiency. Careful

effort was therefore required to fix prices in such a way that they would put pressure on costs. Fairness demanded that prices be fixed in the light of the particular circumstances in each case. Since circumstances varied widely between contractors, comparative prices could not be relied upon as a controlling factor. Reliance on comparative prices would have tended to level off at the top--with obvious disadvantages.

These early concepts underscored the need for effective legal action. In 1942, contractors wanted a contract providing for adjustment of price in accordance with the movement of some independent and reliable yardstick. A contract clause was quickly developed which used labor and material indexes as the yardstick. We soon learned, however, that national indexes had little real significance in determining a particular contractor's price necessities and involved difficult problems of cost accounting. Experience soon suggested the desirability of negotiation as a substitute for cost determination.

Negotiation, at first, was not a howling success. We first experimented with the redetermination or ceiling clause. This contemplated an agreement based on a formula by which the original fixed price would be arbitrarily reduced after the completion of a preliminary or trial run, to the extent that costs experienced were less than costs anticipated. The profit would be the same percentage of redetermined costs as originally contemplated. The new method led to endless discussions and disputes between auditors and accountants on the determination of individual contract costs.

A companion to the redetermination clause was the negotiated price revision clause which provided that, after a test run, industry and Ordnance would negotiate a new price to be applicable to the entire contract term, the price to be higher or lower than originally stated. This clause was, in theory, an improvement on the redetermination clause in that it provided a two-way street and left the determination of price to agreement rather than to the application of a mathematical formula to determined facts. It was not so popular, however, as the redetermination clause. Contractors reasoned that the provision for upward adjustment was not important because the ceiling price under the redetermination clause could be negotiated at a sufficiently high level so that any adjustment was bound to be downward. Ordnance contracting officers also felt that their record would look better if the initial price could only go downward. There was still a general feeling that a price fixed by formula was preferable to negotiation.

Experimentation with the original measures served to crystallize certain additional basic concepts upon which rested the subsequent development of Ordnance purchase policy. Three typical concepts may be cited.

First of all we were convinced that wartime contracting can be successfully conducted only if a fiduciary relationship exists, and is recognized, between industry and Ordnance. Fairness to particular contractors in the determination of proper prices required the complete disclosure of facts which were not ordinarily our business.

Secondly, the objective of pricing was to fix a fair price for each individual contractor in the light of the circumstances in his case. There is no correct price for all producers of an item. Every contractor who is efficient and exercises careful control of costs should be given a price which contemplates a greater profit than would otherwise be justified. But this reward cannot be granted unless the facts are known and unless the contractor realizes that he must share his efficiency with his Government. High-cost producers must be paid prices which will cover their costs and a reasonable profit; but the facts must be disclosed in order to justify a price which is high competitively.

As a third consideration, it was believed that prices should be negotiated at levels which would put pressure on costs. Unless prices were placed at proper levels, the manufacturer would lack incentives to control his costs and thereby conserve manpower and materials. Again prices which did not place pressure on costs tended to destroy the cost-consciousness of manufacturers.

Then came the renegotiation statute of 28 April 1942, which provided for the over-all review of the war business of prime contractors and subcontractors to the end that profits realized on such business, which was held to be excessive, could be refunded or recaptured by the Government.

Since we were responsible under the statute for its administration with respect to Ordnance contractors, it was necessary to establish an organization to discharge this responsibility effectively. Price adjustment boards were therefore set up in the 13 Ordnance districts and a staff unit was created in Washington to coordinate the work done in the districts. The district boards, together with the necessary accounting and legal assistants, handled the renegotiation of about 4,000 contracts a year.

The passage of the renegotiation statute had a profound effect upon Ordnance purchasing activities, quite apart from the money recaptured. Some contractors were inclined to ask for higher prices on the theory that, even if prices turned out to be excessive, the money would go back to the Government through renegotiation and that, as a consequence, discussions as to original prices were wholly academic. Some few Ordnance officers felt that, even if a satisfactory price was not initially negotiated, renegotiation personnel would rectify the mistake.

This sort of immature thinking threatened an upward trend in prices, since the amount of the renegotiation refund depended, in part, upon the amount of costs. The existence of excessive prices, in turn, had a tendency to create an upward trend in costs. The basic error consisted in forgetting that, while renegotiation could recapture millions of dollars, a wasted hour of labor could never be recaptured. When prices are negotiated at levels where no pressure on costs is exerted, not only does the war cost more in dollars but it is delayed in its execution and conclusion because manpower and materials are not effectively used.

The statute was intended to provide for the adjustment of future as well as past prices. Ordnance has always believed that there should be the closest possible coordination between renegotiation and procurement, since in both cases government representatives were negotiating with the same contractors with respect to prices to be paid for the same items of war material. Unless close coordination was maintained, confusion would result. Early in 1943 Ordnance renegotiation personnel were advised that renegotiation should not be regarded as completed by the mere recapture of excessive profits. They were directed to cooperate with procurement personnel in developing forward pricing agreements to the end that excessive profits realized in the past would not be perpetuated in the future.

This principle proved to be difficult of accomplishment. Renegotiation personnel were preoccupied with recapturing excessive profits and had little interest and less skill in pricing. Due to a late start for the fiscal year 1942, it was not until the latter part of 1943 that the bulk of the 1942 fiscal year reached renegotiation and, naturally, the data developed had little significance with respect to the soundness of the then current prices or those to be charged later in 1943 and 1944. The result was that little was done at that time on forward prices except to insert a general provision in renegotiation agreements to the effect that contractors would, from time to time, review their costs and make such reductions in prices as seemed justified.

The renegotiation statute also served to call attention to the fact that contractors were asked to fix a price for items to be produced over a period of many months and had no way of determining what their costs would be throughout the entire period. Many costs were beyond their control and subject to adjustment by reason of decisions and directives on the part of government agencies. The result was that contractors included contingency provisions in their prices. If close prices were to be obtained, contractual methods had to be found for affording contractors ample protection in justifiable cases.

These various factors led to the development of the Periodic Price Adjustment Article. By this article contractors and Ordnance were able to negotiate a fixed price which would be applicable only for a comparatively brief period of time. Since contractors could reasonably foresee their costs for a period of from three to six months, they could justify close prices for that single period.

In order that contractors might have incentives to exercise their ingenuity in controlling costs, the Periodic Price Adjustment Article expressly stated that where a contractor, through his efficiency, had reduced costs during any contract below the cost estimated for that period, he would be rewarded by receiving a larger profit ratio on prices for the succeeding period. The article was particularly adapted to exemption from renegotiation because it was designed to eliminate contingency provisions from prices. Since it gave contractors maximum protection and Ordnance close prices, the periodic article found wide acceptance prior to VJ-day as the most satisfactory contractual provision for war procurement yet developed.

As previously stated, one of the basic concepts of Ordnance purchase policy was that a reasonable price should be negotiated with each contractor in the light of his particular circumstances, and that prices could not be established unless disclosure was made by the contractor of such circumstances. This concept led to the development of the so-called price analysis function.

Ordnance learned early in war procurement that competitive prices were by no means a complete and adequate test of proper prices. It became apparent that specialists would have to be trained and procedures established so that all information available in Ordnance could be brought to bear on each procurement. An organization of price analysts was therefore formed within the framework of existing procurement personnel. These men studied all the factors relating to a price and thereby assisted negotiators in arriving at equitable results. They collected all available data on competitive prices and tried to find explanations for wide variations in such prices. They analyzed cost information, submitted as a part of bid proposals, and made comparative studies to explain differences in such costs. The basic purpose of all these activities was to determine the facts with respect to each particular case in order that a proper price could be negotiated in the light of the circumstances in that case.

Price analysis activities, and the consequent elimination of contingency provisions in price, brought into proper focus the three types of risks which a contractor was required to assume: Risks within the ordinary managerial control of the contractor, risks within the control of the Government, and risks inherent in war work which were under the control of neither party. The tendency of industry was to lump together all three classes of risks and to seek protection solely through ample provision for contingencies in price.

Upon analysis and segregation of these risks, a contractor was generally cognizant that normal risks within his control should be his responsibility. He recognized the fact that, in considerable measure, the profit which he received was compensation for the assumption of risk. The Government, on the other hand, itself controlled certain risks. It seemed obvious that the Government should not pay, in price, insurance against contingencies which might or might not arise and which were within its control. It followed, therefore, that the contractor should be protected against such risks through contract clauses rather than by the inclusion of a contingency provision in price. Ordnance properly undertook to provide reasonable protection by contract clauses against any risk within Government control. The third type of risk, beyond the control of either party, was inherent in the character of the work being performed. Such a risk was the explosive hazard of the powder manufacturer and similar hazards. It was estimated that such risks should be recognized, segregated and appraised, and that a fair provision should be made for them in the contract price.

We now come to the final step in Ordnance procurement policy.

Many contractors, for competitive reasons, because of OPA price ceilings, or for other reasons, charged unduly low prices on some items and unreasonably high prices on others. As cutbacks and terminations occurred, they learned that they were in danger of having their profitable business cancelled, leaving them only with contracts carrying inadequate prices. From the Government's standpoint, attempts to test individual contract prices involved perplexing problems of cost allocation. Many of these problems could be minimized or eliminated if attention were given to all of a contractor's business rather than to a segment of it.

These considerations indicated the desirability of establishing a program for the review of contractors' prices on an over-all, company-wide basis. Such a program was initiated by Ordnance in June 1944, and subsequently became known as the Company Pricing Program. Our thought was that, at the time of renegotiation, if possible, a review would be made of the probable results which would accrue to the company on an over-all basis during a future period. An effort would be made to secure a voluntary agreement which would adjust the contractor's prices in such a way that excessive profits would not accumulate. Adequate provisions were included to furnish the contractor with adequate protection against risks beyond his control. This program was not regarded as a substitute for the negotiation of sound individual contracts but rather as a tool to be used in special situations where the application of its techniques seemed appropriate. The program was a success and resulted in many agreements, mostly on an informal basis, which effectively served their purpose.

If my memory of the days when I was a member of this faculty serves me correctly, the lecturer should recommend to his hearers some collateral reading. There are two recent articles on the general subject of my lecture which I recommend to you most enthusiastically. Both were published in the same magazine. The magazine is "Army Ordnance", journal of the Army Ordnance Association. In the November-December 1945 issue (vol. XXIX No. 153, page 397) is an article by the Secretary of War, Robert P. Patterson, which was written while he was under secretary. Its title is "Tax Amortization". In the same magazine (vol. XXX, No. 154, page 47) is an article on the Ordnance districts entitled "Weapons Win Wars" by Brigadier General Edward S. Greenbaum who, until his recent return to civilian life, was executive officer to the Under Secretary of War. Both articles are of unusual significance to the work I have attempted to describe in this lecture.

In summing up, I should like to repeat certain basic Ordnance precepts. I believe that procurement can be conducted successfully in a democracy only by agreement. Government agencies are dependent upon free enterprise and the profit motive for the production of war material. Contracts must protect the contractor against risks outside of his control. Prices should be negotiated upon the basis of what the contractor's individual circumstances indicate to be fair and reasonable. A price should not be the lowest price that hard and relentless bargaining can produce, nor should it be a price so high that the contractor is assured of excessive profits and, consequently, has no incentive to

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control costs and improve his manufacturing techniques. Profiteering was controlled by voluntary agreement. Industry and Ordnance were partners and recognized that each owed fiduciary relations to the other. The "Industry-Ordnance" team, today as yesterday, stands for mutual trust and the free exchange of information in procurement no less than in research, development and production.

GENERAL ARMSTRONG:

General Quinton, thank you very much for your home-coming address. We are very glad to have had you with us and to hear your excellent talk. Thank you very much.

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